REPUBLIC OF MAURITIUS

DEPARTMENT OF CIVIL AVIATION

Sir Seewoosagur Ramgoolam International Airport, Plaine Magnien

MAURITIUS CIVIL AVIATION REQUIREMENTS

MCAR UAS

Unmanned Aircraft System

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FOREWORD

This MCAR-UAS is being issued by the Department of Civil Aviation of Mauritius (hereinafter referred to as the Authority) under Regulations 10, 11 and 13 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

Following the promulgation of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, this revised Mauritius Civil Aviation Requirements (MCAR) is being issued to guide UAS owners/operators on how to comply with the technical requirements to ensure safe operation of Unmanned Aircraft System (UAS).

The MCAR-UAS details the process of registration requirements and operational conditions for the various types of use of UAS in the Mauritian airspace. It also provides the requirements in terms of training required to obtain the Certificate of Competency for the operator/pilot.

Additionally, provisions are made for the registration of organisation intending to provide UAS services. This revision of the MCAR UAS introduces the requirements for Agricultural UAS (Drone) Operations in SUBPART G of this MCAR UAS.

This MCAR-UAS describes in detail the three different categories of operations. It also elaborates on the various sub categories of operations and the operational requirements and restrictions for each type of operation. It provides guidance on the application and approval process as well as documents to be developed and submitted.

Any amendments to the text in revised editions will be issued as a complete amendment of pages contained within. In this document **'Shall'** is used to indicate a mandatory requirement and may appear in MCAR, **'Should'** is used to indicate a recommendation, **'May'** is used to indicate discretion by the Authority, or the industry as appropriate and **'Will'** indicates a mandatory requirement and is used to advise of action incumbent on the Authority.

All inconsistencies or uncomprehensible statement or any proposal for change to the requirements should be addressed to the Authority for consideration and any action deem necessary.

This amended MCAR-UAS on Unmanned Aircraft System will be effective as from 03 September 2026.

S RAMBRICHH
Director of Civil Aviation

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SUBPART A

UAS OPERATIONS IN THE 'OPEN' CATEGORY

UAS.OPEN.010 GENERAL PROVISIONS

(1) The category of UAS 'open' operations is divided into three subcategories A1, A2 and A3, on the basis of operational limitations, requirements for the remote pilot and technical requirements for UAS.

(2) Where the UAS operation involves the flight of the unmanned aircraft starting from a natural elevation in the terrain or over terrain with natural elevations, the unmanned aircraft shall be maintained within 120 metres from the closest point of the surface of the earth. The measurement of distances shall be adapted accordingly to the geographical characteristics of the terrain, such as plains, hills, mountains.

(3) 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.

(4) By way of derogation from point (2), unmanned sailplanes with a MTOM, including payload, of less than 10 kg, may be flown at a distance in excess of 120 metres from the closest point of the surface of the earth, provided that the unmanned sailplane is not flown at a height greater than 120 metres above the remote pilot at any time.

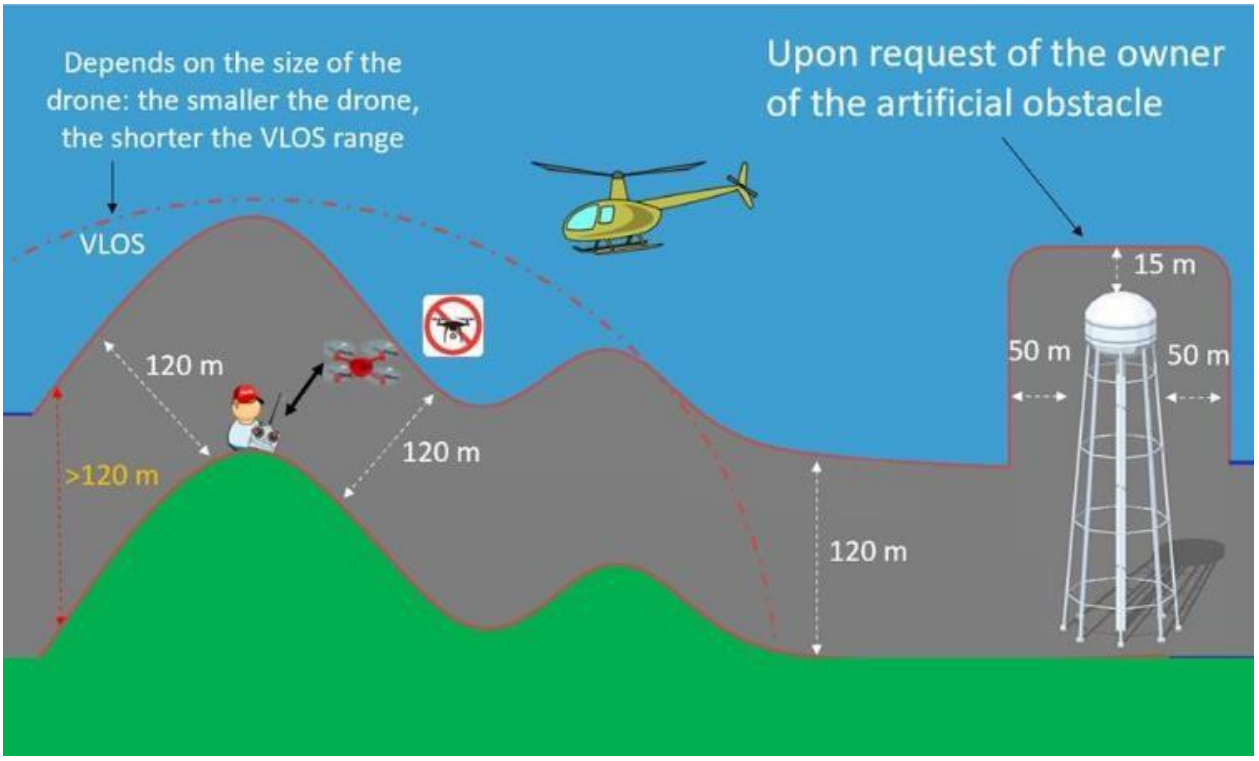
GM1 UAS.OPEN.010 GENERAL PROVISIONS

MAXIMUM HEIGHT

The remote pilot must ensure that he or she keeps the unmanned aircraft (UA) at a distance less than 120 m (400 ft) from the terrain, and the picture below shows how the maximum height that the UA may reach changes according to the topography of the terrain. In addition, when the Authority has defined a geographical zone with a

lower maximum height, the remote pilot must ensure that the UA always complies with the requirements of the geographical zone.

The entity responsible for the artificial obstacle referred to in point UAS.OPEN.010(3) needs to explicitly grant the unmanned aircraft system (UAS) operator permission to conduct an operation close to a tall man-made obstacle, e.g. a building, or antenna. No UAS operator should conduct an operation close to such an obstacle without permission from the entity responsible for the obstacle.



GM1 UAS.OPEN.010(4) GENERAL PROVISIONS

This derogation was included to allow model gliders to continue to operate along slopes. Strictly applying the 120-metre distance from the closest point of the surface of the earth would have had disproportionate consequences. These operations have been conducted successfully for decades and have generated a micro-economy in certain countries. Two measures have been put in place to reduce the risk:

A Maximum Take-Off Mass (MTOM), including the payload, limited to 10 kg to reduce the consequences of an impact. 10 kg should cover the vast majority of gliders in operation.

(b) The maximum height above the remote pilot is limited to 120 m, which reduces the air risk.

UAS.OPEN.020 UAS OPERATIONS IN SUBCATEGORY A1

UAS operations in subcategory A1 shall comply with all of the following conditions:

(1) for unmanned aircraft referred to in point (5)(d), be conducted in such a way that a remote pilot of the unmanned aircraft does not overfly assemblies of people and reasonably expects that no uninvolved person will be overflown. In the event of unexpected overflight of uninvolved persons, the remote pilot shall reduce as much as possible the time during which the unmanned aircraft overflies those persons;

(2) in the case of an unmanned aircraft referred to in points (5)(a), (5)(b) and (5)(c), be conducted in such a way that the remote pilot of the unmanned aircraft may overfly uninvolved persons, but shall never overfly assemblies of people;

(3) by way of derogation from point (d) of paragraph 1 of regulation 4, be conducted, when the follow-me mode is active, up to a distance of 50 metres from the remote pilot;

(4) be performed by a remote pilot who:

(a) is familiar with manufacturer's instructions provided by the manufacturer of the UAS;

(b) in the case of an unmanned aircraft class C1, as defined in Third Schedule an online training course followed by completing successfully an online of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, has completed theoretical knowledge examination provided by the Authority or by an entity designated by the Authority of a Contracting State achieving at least 75% of the overall marks. The examination shall comprise 40 multiple-choice questions distributed appropriately across the following subjects:

(i) air safety;

(ii) airspace restrictions;

(iii) aviation regulation;

(iv) human performance limitations;

(v) operational procedures;

(vi) UAS general knowledge;

(vii) privacy and data protection;

(viii) insurance;

(ix) security.

(5) be performed with an unmanned aircraft that:

(a) has an MTOM, including payload, of less than 250 g and a maximum operating speed of less than 19 m/s, in the case of a privately built UAS; or

(b) is marked as class C0 and complies with the requirements of that class, as defined in the Third Scheduled of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

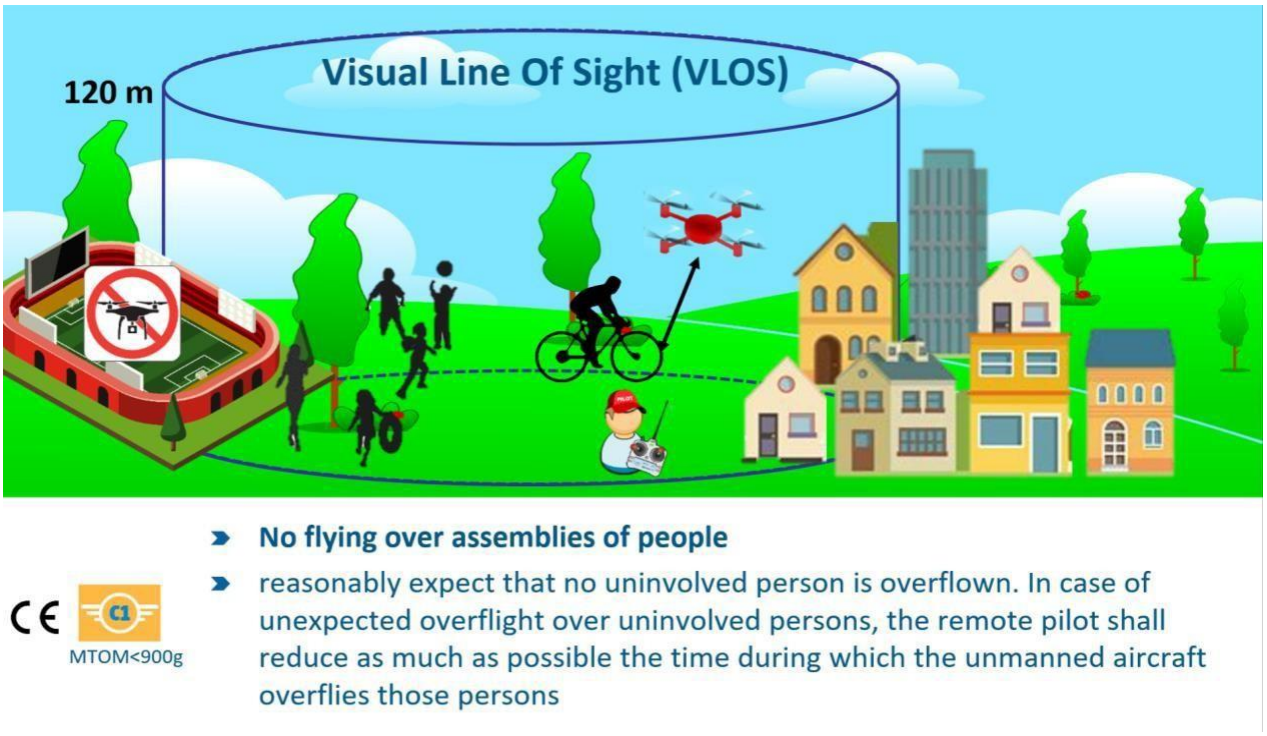
(c) is marked as class C1 and complies with the requirements of that class, as defined in Third Scheduled of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and is operated with active and updated direct remote identification system and geo-awareness function.

AMC1 UAS.OPEN.020(1) AND (2) UAS OPERATIONS IN SUBCATEGORY

OPERATIONAL LIMITATIONS IN SUBCATEGORY A1

As a principle, the rules prohibit overflying assemblies of people. Overflying isolated people is possible, but there is a distinction between class C1 and class C0 UAS or privately built UAS with MTOMs of less than 250 g.

(a) For UAS in class C1, before starting the UAS operation, the remote pilot should assess the area and should reasonably expect that no uninvolved person will be overflown. This evaluation should be made taking into account the configuration of the site of operation (e.g. the existence of roads, streets, pedestrian or bicycle paths), and the possibility to secure the site and the time of the day. In case of an unexpected overflight, the remote pilot should reduce as much as possible the duration of the overflight, for example, by flying the UAS in such a way that the distance between the UA and the uninvolved people increases, or by positioning the UAS over a place where there are no uninvolved people.



(b) It is accepted that UAS in class C0 or privately built UAS with MTOMs less than 250 g may fly over uninvolved people; however, this should be avoided whenever possible, and where it is unavoidable, extreme caution should be used.

AMC1 UAS.OPEN.020(4)(B) AND UAS.OPEN.040(3) UAS OPERATIONS IN SUBCATEGORIES A1 AND A3d A3

THEORETICAL KNOWLEDGE SUBJECTS FOR BASIC ONLINE TRAINING COURSES AND EXAMINATIONS FOR SUBCATEGORIES A1 AND A3

The acquisition of theoretical knowledge by each remote pilot should cover the following elements:

(a) Air safety:

(1) non-reckless behaviour, safety precautions for UAS operations and basic requirements regarding dangerous goods;

(2) starting or stopping the operations taking into account environmental factors, UAS conditions and limitations, remote pilot limitations and human factors;

(3) operation in visual line of sight (VLOS), which entails:

(i) keeping a safe distance from people, animals, property, vehicles, and other airspace users;

(ii) the identification of assemblies of people;

(iii) a code of conduct in case the UA encounters other traffic;

(iv) respecting the height limitation; and

(v) when using a UA observer, the responsibilities and communication between the UA observer and the remote pilot; and

(4) familiarisation with the operating environment, in particular:

(i) how to perform the evaluations of the presence of uninvolved person in the overflown area as required in MCAR-UAS.OPEN.020(1) and MCAR-UAS.OPEN.040(1); and

(ii) informing the people involved;

(b) Airspace restrictions:

(1) obtain and observe updated information about any flight restrictions or conditions published by the Authority according to Regulation 18.

(c) Aviation regulations:

(1) Introduction to Mauritius Civil Aviation system;

(2) The Civil Aviation Unmanned Aircraft System Regulation

(i) their applicability to Mauritius and third Country cross border operators;

(ii) subcategories in the 'open' category and the associated classes of UAS;

(iii) registration of UAS operators;

(iv) the responsibilities of the UAS operator;

(v) the responsibilities of the remote pilot; and

(vi) incident – accident reporting;

(d) Human performance limitations:

(1) the influence of psychoactive substances or alcohol or when the remote pilot is unfit to perform their tasks due to injury, fatigue, medication, sickness or other causes;

(2) human perception:

(i) factors influencing VLOS;

(ii) the distance of obstacles and the distance between the UA and obstacles;

(iii) evaluation of the speed of the UA;

(iv) evaluation of the height of the UA;

(v) situational awareness; and

(vi) night operations.

(e) Operational procedures:

(1) pre-flight:

(i) assessment of the area of operation and the surrounding area, including the terrain and potential obstacles and obstructions for

keeping VLOS of the UA, potential overflight of uninvolved persons, and the potential overflight of critical infrastructure;

(ii) identification of a safe area where the remote pilot can perform a practice flight;

(iii) environmental and weather conditions (e.g. factors that can affect the performance of the UAS such as electromagnetic interference, wind, temperature, etc.); methods of obtaining weather forecasts; and

(iv) checking the conditions of the UAS;

(2) in-flight:

(i) normal procedures; and

(ii) procedures for abnormal situations (e.g. for lost-data-link connections);

(3) post-flight:

(i) maintenance; and

(ii) logging of flight details;

(f) UAS general knowledge:

(1) basic principles of flight;

(2) the effect of environmental conditions on the performance of the UAS;

(3) principles of command and control:

(i) overview;

(ii) data link frequencies and spectrums; and

(iii) automatic flight modes, override and manual intervention;

(4) familiarisation with the instructions provided by the user's manual of a UAS, and in particular with regard to:

(i) overview of the main elements of the UAS;

(ii) limitations (e.g. mass, speed, environmental, duration of battery, etc.);

(iii) controlling the UAS in all phases of flights (e.g. the take-off, hovering in mid-air, when applicable, flying basic patterns and landing);

(iv) features that affect the safety of flight;

(v) setting the parameters of the lost link procedures;

(vi) setting the maximum height;

(vii) procedures to load geographical zone data into the geo-awareness system;

(viii) procedures to load the UAS operator registration number into the direct remote identification system;

(ix) safety considerations:

(A) instructions to secure the payload;

(B) precautions to avoid injuries from rotors and sharp edges; and

(C) the safe handling of batteries;

(x) Maintenance instructions:

(g) Privacy and data protection:

(1) understanding the risk posed to privacy and data protection; and

(2) the guiding principles for data protection under the Mauritius Data Protection Act;

(h) Insurance:

(1) liability in case of an accident or incident;

(2) general knowledge of the Mauritius regulations; and

(3) awareness of the possible different national requirements for insurance in third Countries.

(i) Security:

(1) an understanding of the security risk;

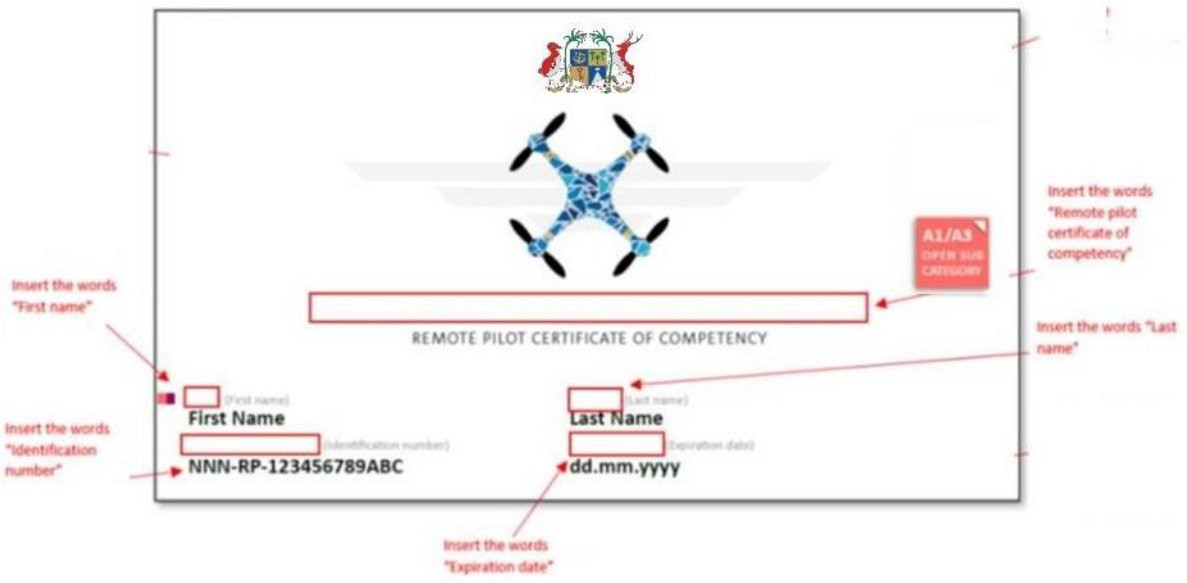
(2) an overview of the Mauritius regulations;

(3) awareness of the possible different national requirements for security in third Countries.

AMC2 UAS.OPEN.020(4)(B) AND UAS.OPEN.040(3) UAS OPERATIONS IN SUBCATEGORIES A1 AND A3

PROOF OF COMPLETION OF THE ONLINE THEORETICAL KNOWLEGDE TRAINING COURSE AND SUCCESSFUL COMPLETION OF THE ONLINE THEORETICAL KNOWLEGDE EXAMINATION

Upon receipt of proof of a remote pilot passing the online theoretical examination, the Authority should provide the following proof of completion to the remote pilot. The proof may be provided in electronic form.



(1) Insert the identifier provided by the authority releasing the proof of completion. The reference should have the following format:

NNN-RP-XXXXXXXXX

Where:

1. NNN is the ISO 3166 Alpha-3 code of the State releasing the proof of completion;

2. RP is a fixed field meaning: remote pilot; and

3. XXXXXXXXX are 12 alphanumeric characters (lower-case only) defined by the Authority the proof of completion.

As an example: (MUR-RP-123456789abc)

AMC1 UAS.OPEN.020(5)(C) AND (D), UAS.OPEN.030(3) AND UAS.OPEN.040(4)(C), (D) AND (E) UAS OPERATIONS IN SUBCATEGORIES A1, A2 AND A3

MODIFICATION OF A UAS WITH A CE CLASS MARK

When placing UASs with a class identification label on the market, manufacturers should ensure the compliance of those UASs with the applicable regulatory requirements. It is the responsibility of UAS operators to ensure that those UASs remain compliant throughout their lifetime. UAS operators should, therefore, not make any modifications to a UAS in class C0, C1, C2, C3 or C4 that breach compliance with the product requirements, unless the modification is foreseen by the manufacturer and documented in the manufacturer's instructions.

The replacement of a part by a similar one for maintenance purposes is not considered a modification, provided the operator uses an original part or a part that complies with the characteristics defined by the manufacturer in the list of replaceable parts provided in the manufacturer's instructions.

The affixation of payload is not considered a modification provided that affixing a payload is not forbidden by the manufacturer and the payload complies with the characteristics provided in the manufacturer's instructions. Affixing a payload when it is forbidden by the manufacturer or affixing a payload that does not comply with the characteristics provided in the manufacturer's instructions is strictly forbidden.

If the payload does not comply with the characteristics of the allowed payloads or if maintenance is not performed according to the manufacturer's instructions, it is then considered a modification that invalidates the class conformity. The class identification label must be removed from the UAS identification label and the modified UAS may only be operated in the 'specific' category in accordance with Subpart B of this MCAR.

Changes to UASs with a class identification label C4 are allowed, and such UASs can be considered 'privately built' UASs and continue to be operated in subcategory A3 of the 'open' category.

GM1 UAS.OPEN.020(5)(C) AND (D), UAS.OPEN.030(3) AND UAS.OPEN.040(4)(C), (D) AND (E) UAS OPERATIONS IN SUBCATEGORIES A1, A2 AND A3

MODIFICATION OF A UAS WITH A CE CLASS MARK

Modifications to UAS that breach compliance with the requirements for any acceptable marking are those that affect the weight or performance so that they are outside the specifications or the instructions provided by the manufacturer in the user manual. A replacement of a part with another that has the same physical and functional characteristics is not considered to be a breach of the requirements for the acceptable marking (e.g. a replacement of a propeller with another of the same design). The UA

user manual should define instructions for performing maintenance and applying changes that do not breach compliance with the acceptable marking requirements.

UAS.OPEN.030 UAS OPERATIONS IN SUBCATEGORY A2

UAS operations in subcategory A2 shall comply with all of the following conditions:

(1) be conducted in such a way that the unmanned aircraft does not overfly uninvolved persons and the UAS operations take place at a safe horizontal distance of at least 30 metres from them; the remote pilot may reduce the horizontal safety distance down to a minimum of 5 metres from an uninvolved person when operating an unmanned aircraft with an active low speed mode function and after evaluation of the situation regarding:

(a) weather conditions,

(b) performance of the unmanned aircraft,

(c) segregation of the overflown area.

(2) be performed by a remote pilot who is familiar with manufacturer's instructions provided by the manufacturer of the UAS and holds a certificate of remote pilot competency issued by the Authority or by an entity designated or accepted by the Authority. This certificate shall be obtained after complying with all of the following conditions and in the order indicated:

(a) completing an online training course and passed the online theoretical knowledge examination as referred to in point (4)(b) of point MCAR-UAS.OPEN.020;

(b) completing a self-practical training in the operating conditions of the subcategory A3 set out in points (1) and (2) of point MCAR-UAS.OPEN.040;

(c) declaring the completion of the self-practical training defined in point (b) and passing an additional theoretical knowledge examination provided by the Authority or at an entity designated by the Authority of a Contracting State achieving at least 75% of the overall marks. The examination shall comprise at least 40 multiple-choice questions aimed at assessing the remote pilot's knowledge of the technical and operational mitigations for ground risk, distributed appropriately across the following subjects:

(i) meteorology;

(ii) UAS flight performance;

(iii) technical and operational mitigations for ground risk.

(3) be performed with an unmanned aircraft which is marked as class C2 and complies with the requirements of that class, as defined in the Third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024and is operated with active and updated direct remote identification system and geo-awareness function.

AMC1 UAS.OPEN.030(1) UAS operations in subcategory A2

SAFE DISTANCE FROM UNINVOLVED PERSONS

(a) The minimum horizontal distance of the UA from uninvolved persons should be defined as the distance between the points where the UA would hit the ground in the event of a vertical fall and the position of the uninvolved persons.

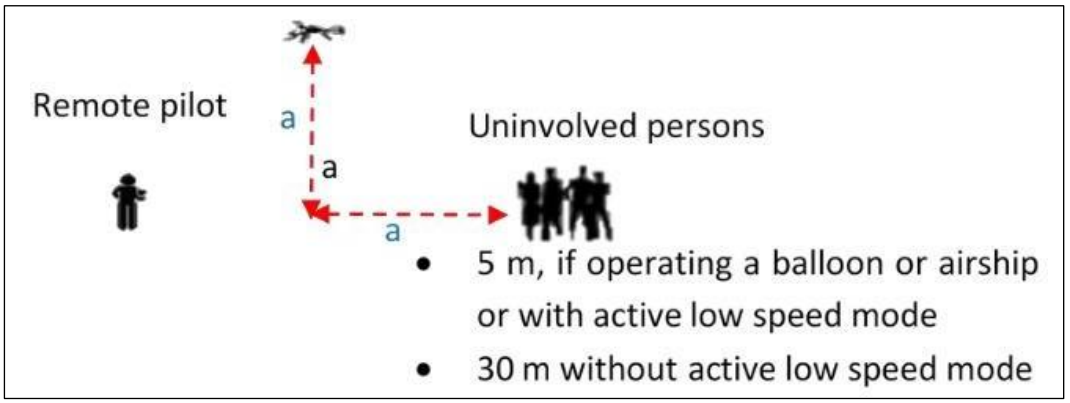
(b) As a reference, when the UA is operating in close proximity to people, the remote pilot should keep the UA at a lateral distance from any uninvolved person that is not shorter than the height (‘1:1 rule’, i.e. if the UA is flying at a height of 30 m, the distance from any uninvolved person should be at least 30 m).

(c) In any case, the distance from uninvolved persons should always be greater than:

(1) 5 m, when the low-speed mode function on the UA is activated and set to 3 m per second;

(2) 5 m, when operating a UAS balloon or airship; or

(3) 30 m in all other cases.



GM1 UAS.OPEN.030(1) UAS operations in subcategory A2

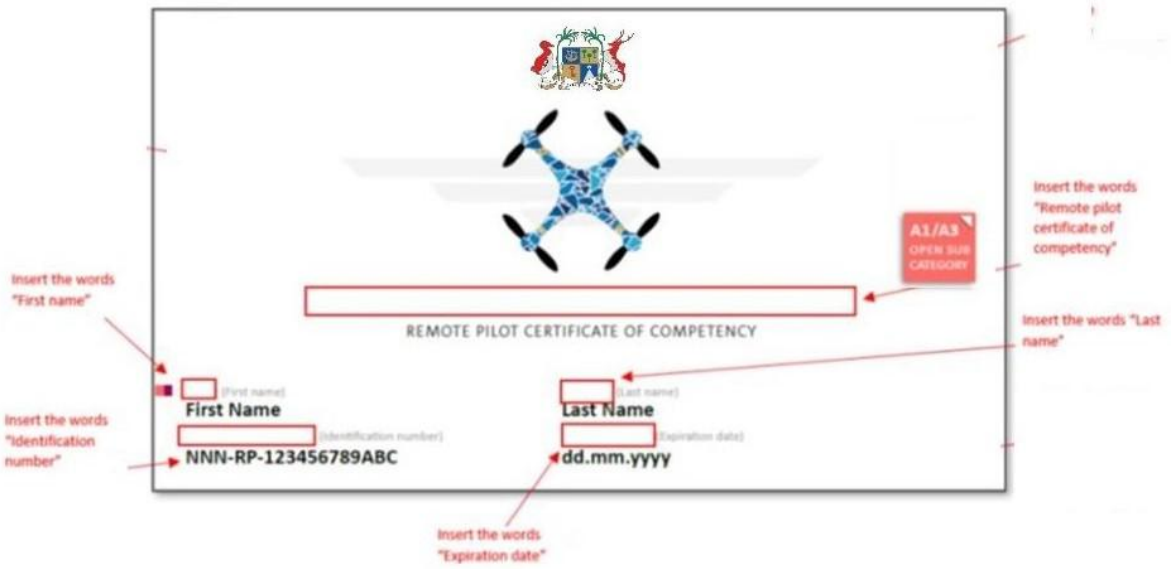
SAFE DISTANCE FROM UNINVOLVED PERSONS

The safe distance of the UA from uninvolved persons is variable and is heavily dependent on the performance and characteristics of the UAS involved, the weather conditions and the segregation of the overflown area. The remote pilot is ultimately responsible for the determination of this distance.

AMC1 UAS.OPEN.030(2) UAS operations in subcategory A2

REMOTE PILOT CERTIFICATE OF COMPETENCY

After the verification that the applicant has passed the online theoretical knowledge examination, has completed and declared the self-practical training and has passed the additional theoretical knowledge examination provided by the Authority or by an entity recognised by the Authority, the Authority should provide the following certificate of competency to the remote pilot. The certificate may be provided in electronic form.



(1) Insert the identifier provided by the authority releasing the remote pilot certificate of competency. The reference should have the following format:

NNN-RP-xxxxxxxxx

Where:

1. NNN is the ISO 3166 Alpha-3 code of the State releasing the proof of completion;

2. RP is a fixed field meaning: remote pilot; and

3. XXXXXXXXX are 12 alphanumeric characters (lower-case only) defined by the MS releasing the proof of completion.

As an example: (MUR-RP-123456789abc)

AMC1 UAS.OPEN.030(2)(b) UAS operations in subcategory A2

PRACTICAL SELF-TRAINING

(a) The aim of the practical self-training is to ensure that the remote pilot should be able to demonstrate at all times the ability to:

(1) operate a class C2 UAS within its limitations;

(2) complete all manoeuvres with smoothness and accuracy;

(3) exercise good judgment and airmanship;

(4) apply their theoretical knowledge; and

(5) maintain control of the UA at all times in such a manner that the successful outcome of a procedure or manoeuvre is never seriously in doubt.

(b) The remote pilot should complete the practical self-training with a UAS that features the same flight characteristics (e.g. fixed wing, rotorcraft), control scheme (manual or automated, human machine interface) and a similar weight as the UAS intended for use in the UAS operation. This implies the use of a UA with an MTOM of less than 4 kg and bearing the Class 2 acceptable marking.

(c) If a UAS with both manual and automated control schemes is used, the practical self-training should be performed with both control schemes. If this UAS has multiple automated features, the remote pilot should demonstrate proficiency with each automated feature.

(d) The practical-skills self-training should contain at least flying exercises regarding take-off or launch and landing or recovery, precision flight manoeuvres remaining in a given airspace volume, hovering in all orientations or loitering around positions when applicable. In addition, the remote pilot should follow the contingency procedures for abnormal situations (e.g. a return-to-home function,

if available), as stipulated in the user's manual provided by the manufacturer. However, the remote pilot should only follow those contingency procedures that do not require the deactivation of the UAS functions that may reduce its safety level.

AMC2 UAS.OPEN.030(2)(b) UAS operations in subcategory A2

PRACTICAL COMPETENCIES FOR PRACTICAL SELF-TRAINING

When executing the practical self-training, the remote pilot should perform as many flights as they deem necessary to gain a reasonable level of knowledge and the skills to operate the UAS.

The following list of practical competencies should be considered:

(a) Preparation of the UAS operation:

(1) make sure that the:

(i) chosen payload is compatible with the UAS used for the UAS operation;

(ii) zone of UAS operation is suitable for the intended operation; and

(iii) UAS meets the technical requirements of the geographical zone;

(2) define the area of operation in which the intended operation takes place in accordance with MCAR-UAS.OPEN.040;

(3) define the area of operation considering the characteristics of the UAS;

(4) identify the limitations published by the Authority for the geographical zone (e.g. no-fly zones, restricted zones, prohibited area and zones with specific conditions near the operation zone), and if needed, seek authorisation by the entity responsible for such zones;

(5) identify the goals of the UAS operation;

(6) identify any obstacles and the potential presence of uninvolved persons in the area of operation that could hinder the intended UAS operation; and

(7) check the current meteorological conditions and the forecast for the time planned for the operation.

(b) Preparation for the flight:

(1) assess the general condition of the UAS and ensure that the configuration of the UAS complies with the instructions provided by the manufacturer in the user's manual;

(2) ensure that all removable components of the UA are properly secured;

(3) make sure that the software installed on the UAS and on the remote pilot station (RPS) is the latest published by the UAS manufacturer;

(4) calibrate the instruments on board the UA, if needed;

(5) identify possible conditions that may jeopardise the intended UAS operation;

(6) check the status of the battery and make sure it is compatible with the intended UAS operation;

(7) update the geo-awareness system;

(8) set the height limitation system, if needed;

(9) set the low-speed mode, if available; and

(10) check the correct functioning of the C2 link.

(c) Flight under normal conditions:

(1) using the procedures provided by the manufacturer in the user's manual, familiarise with how to:

(i) take off (or launch)

(ii) make a stable flight:

(A) hover in case of multirotor UA;

(B) perform coordinated large turns;

(C) perform coordinated tight turns;

(D) perform straight flight at constant altitude;

(E) change direction, height and speed;

(F) follow a path;

(G) return of the UA towards the remote pilot after the UA has been placed at a distance that no longer allows its orientation to be distinguished, in case of multirotor UA;

(H) perform horizontal flight at different speed (critical high speed or critical low speed), in case of fixed wing UA;

(iii) keep the UA outside no-fly zones, prohibited area or restricted zones, unless holding an authorisation;

(iv) use some external references to assess the distance and height of the UA;

(v) perform return to home procedure — automatic or manual;

(vi) land (or recovery); and

(vii) perform landing procedure and missed approach in case of fixed wing UA; and

(2) maintain a sufficient separation from obstacles;

(d) Flight under abnormal conditions:

(i) manage the UAS flight path in abnormal situations;

(ii) manage a situation when the UAS positioning equipment is impaired;

(iii) manage a situation of incursion of a person into the area of operation, and take appropriate measures to maintain safety;

(iv) manage the exit from the operation zone as defined during the flight preparation;

(v) simulate the incursion of a manned aircraft nearby the area of operation;

(vi) simulate he incursion of another UAS in the area of operation;

(vii) select the safeguard mechanism relevant to a situation;

(viii) resume manual control of the UAS when automatic systems render the situation dangerous; and

(ix) carry out the loss of link procedure.

(e) Briefing, debriefing and feedback:

(i) shut down the UAS and secure it;

(ii) carry out a post-flight inspection and record any relevant data on the general condition of the UAS (its systems, components, and power sources);

(iii) conduct a review of the UAS operation; and

(iv) identify situations when an occurrence report is necessary and complete the occurrence report.

AMC1 UAS.OPEN.030(2)(c) UAS operations in subcategory A2

ADDITIONAL THEORETICAL KNOWLEDGE OF SUBJECTS FOR THE EXAMINATION FOR SUBCATEGORY A2

(a) By passing the additional theoretical knowledge examination, the remote pilot should demonstrate that they:

(1) understand the safety risks linked with a UAS operation in close proximity to uninvolved people or with a heavier UA;

(2) are able to assess the ground risk related to the environment where the operation takes place, as well as to flying in close proximity to uninvolved people;

(3) have a basic knowledge of how to plan a flight and define contingency procedures; and

(4) understand how weather conditions may affect the performance of the UA.

(b) The theoretical knowledge examination should cover aspects from the following subjects:

(1) meteorology:

(i) the effect of weather on the UA:

(A) wind (e.g. urban effects, turbulence);

(B) temperature;

(C) visibility; and

(D) the density of the air;

(ii) obtaining weather forecasts;

(2) UAS flight performance:

(i) the typical operational envelope of a rotorcraft, for fixed wing and hybrid configurations;

(ii) mass and balance, and centre of gravity (CG):

(A) consider the overall balance when attaching gimbals, payloads;

(B) understand that payloads can have different characteristics, thus making a difference to the stability of a flight; and

(C) understand that each different type of UA has a different CG;

(iii) secure the payload;

(iv) batteries:

(A) understand the power source to help prevent potential unsafe conditions;

(B) familiarise with the existing different kinds of battery types;

(C) understand the terminology used for batteries (e.g. memory effect, capacity, c-rate); and

(D) understand how a battery functions (e.g. charging, usage, danger, storage); and

(3) technical and operational mitigations for ground risk:

(i) low-speed mode functions;

(ii) evaluating the distance from people; and

(iii) the 1:1 rule.

AMC2 UAS.OPEN.030(2)(c) UAS operations in subcategory A2 and Attachment A to Chapter I of Appendix 1 'Remote pilot theoretical

THEORETICAL KNOWLEDGE EXAMINATION FOR THE CERTIFICATE OF REMOTE PILOT COMPETENCY AND OF THE REMOTE PILOT THEORETICAL KNOWLEDGE FOR STSs

The theoretical knowledge examination to obtain a 'certificate of remote pilot competency' in subcategory A2 of the 'open' category (according to point MCAR-UAS.OPEN.030(2)(c)) and the 'certificate of remote pilot theoretical knowledge' for STSs (as per Attachment A to Chapter I of Appendix 1 of this MCAR) should be conducted:

(1) as a face-to-face examination at the facilities of the Authority, or of the entity that is designated by the Authority (if that entity issues the certificate), or of the entity recognised by the Authority (if the certificate is issued by the Authority); or

(2) through an online-proctored examination provided by the Authority, or the entity that is designated by the Authority (if that entity issues the certificate), or the

entity recognised by the Authority (if the certificate is issued by the Authority). The examination provider should provide the participants in the exam with a clear procedure on how to conduct such an examination as well as with a system that:

(a) allows the adequate verification of the identity of the person that takes the examination;

(b) provides a method to verify that the person that takes the examination does not use during the examination support other than that specified in the examination procedure (e.g. computer traffic data lock and monitoring to prevent screen sharing, mirroring and remote desktop, video and room sound analysis).

GM1 UAS.OPEN.030(2)(c) UAS operations in subcategory A2

REMOTE PILOT COMPETENCIES REQUIRED TO OBTAIN A CERTIFICATE OF REMOTE PILOT COMPETENCY

A remote pilot may obtain the additional theoretical knowledge that is needed to pass the additional theoretical examination for a certificate of remote pilot competency via competency-based training that covers aspects related to non-technical skills in an integrated manner, taking into account the particular risks associated with UAS operations. Competency-based training should be developed using the analysis, design, development, implementation, and evaluation (ADDIE) principles.

The competency may be acquired by one of the following two ways:

(a) Self-study, such as:

(1) reading the manual or leaflet provided by the UA manufacturer;

(2) reading related information or watching instructional films; and

(3) obtaining information from others who have already experience in flying a UA.

(b) Study in a training facility.

A remote pilot may also undertake this study as classroom training, e-learning or similar training at a training facility. Since this training is not mandated by the UAS Regulation, the national aviation authorities (NAAs) are not required to approve the training syllabi.

The remote pilot may also undertake this study as classroom training, e-learning or similar training at a training facility. Since this training is not mandated by the Authority, the training syllabuses will not be approved.

UAS.OPEN.040 UAS operations in subcategory A3

UAS operations in subcategory A3 shall comply with all of the following conditions:

(1) be conducted in an area where the remote pilot reasonably expects that no uninvolved person will be endangered within the range where the unmanned aircraft is flown during the entire time of the UAS operation;

(2) be conducted at a safe horizontal distance of at least 150 metres from residential, commercial, industrial or recreational areas;

(3) be performed by a remote pilot who is familiar with manufacturer's instructions provided by the manufacturer of the UAS and who has completed an online training course and passed an online theoretical knowledge examination as defined in point (4)(b) of point MCAR-UAS.OPEN.020;

(4) be performed with an unmanned aircraft that:

(a) has an MTOM, including payload, of less than 25 kg, in the case of a privately built UAS, or

(b) meets the requirements in sub Category A3 as defined in SUB-Part A of this MCAR;

(c) is marked as class C2 and complies with the requirements of that class, as defined in the third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and is operated with active and updated direct remote identification system and geo-awareness function or;

(d) is marked as class C3 and complies with the requirements of that class, as defined in the third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and is operated with active and updated direct remote identification system and geo-awareness function; or

(e) is marked as class C4 and complies with the requirements of that class, as defined in the third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 .

AMC1 UAS.OPEN.040(1) Operations in subcategory A3

AREAS WHERE UAS OPERATIONS IN A3 MAY BE CONDUCTED

(a) If an uninvolved person enters the range of the UAS operation, the remote pilot should, where necessary, adjust the operation to ensure the safety of the uninvolved person and discontinue the operation if the safety of the UAS operation is not ensured.

(b) A minimum horizontal distance from the person that is passing the area could be estimated as follows:

(1) no less than 30 m;

(2) no less than the height (‘1:1 rule’, i.e. if the UA is flying at a height of 30 m, the distance of the UA from the uninvolved person should be at least 30 m), and

(3) no less than the distance that the UA would cover in 2 seconds at the maximum speed (this assumes a reaction time of 2 seconds).

This minimum horizontal distance is intended to protect people on the ground, but can be extended to property and animals.

GM1 UAS.OPEN.030(1) and UAS.OPEN.040(1) UAS operations in

DIFFERENCE BETWEEN SUB-CATEGORIES A2 AND A3

Subcategory A2 addresses operations during which flying close to people is intended for a significant portion of the flight. The minimum distance ranges from 30 m to 5 m from uninvolved people. 5 m is only allowed when there is an active low-speed mode function on the UA, and the remote pilot has conducted an evaluation of the situation regarding the weather, the performance of the UA and the segregation of the overflown area.

Sub-category A3 addresses operations that are conducted in an area (hereafter referred to as 'the area') where the remote pilot reasonably expects that no uninvolved people will be endangered within the range of the unmanned aircraft where it is flown during the mission. In addition, the operation must be conducted at a safe horizontal distance of at least 150 m from residential, commercial, industrial or recreational areas.

GM1 UAS.OPEN.040(4) UAS operations in subcategory A3

USE OF UASs WITH A CLASS C0 OR C1 CLASS IDENTIFICATION LABEL IN SUBCATEGORY A3

Since subcategory A3 UAS operations are conducted at a 150-m distance from residential, commercial, and industrial areas, where no uninvolved persons are endangered, subcategory A3 encompass subcategory A1 (operations that are not conducted over assemblies of people and over uninvolved people). Therefore, UAS operations in subcategory A3 may also be conducted with an UA with:

(a) a class C0 class identification label that complies with the requirements of the third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

(b) a class C1 class identification label that complies with the requirements of the third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, as well as with an active and updated direct remote identification system and a geo-awareness function.

UAS.OPEN.050 Responsibilities of the UAS operator

The UAS operator shall comply with all of the following:

(1) develop operational procedures adapted to the type of operation and the risk involved;

(2) ensure that all operations effectively use and support the efficient use of radio spectrum in order to avoid harmful interference;

(3) designate a remote pilot for each flight;

(4) ensure that remote pilots and all other personnel performing a task in support of the operations are familiar with manufacturer's instructions provided by the manufacturer of the UAS, and:

(a) have appropriate competency in the subcategory of the intended UAS operations in accordance with points MCAR-UAS.OPEN.020, MCAR-UAS.OPEN.030 or MCAR-UAS.OPEN.040 to perform their tasks or, for personnel other than the remote pilot, have completed an on-the-job-training course developed by the operator;

(b) are fully familiar with the UAS operator's procedures;

(c) are provided with the information relevant to the intended UAS operation concerning any geographical zones published by the Authority in accordance with the First Schedule of the of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.;

(5) update the information into the geo-awareness system when applicable according to the intended location of operation;

(6) in the case of an operation with an unmanned aircraft of one of the classes defined in the third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, ensure that the UAS is:

(a) accompanied by the corresponding National declaration of conformity, including the reference to the appropriate class; and

(b) the related class identification label is affixed to the unmanned aircraft.

(7) Ensure in the case of an UAS operation in subcategory A2 or A3, that all involved persons present in the area of the operation have been informed of the risks and have explicitly agreed to participate.

AMC1 UAS.OPEN.050(1) Responsibilities of the UAS operator

OPERATIONAL PROCEDURES

The UAS operator should develop procedures adapted to the type of operations and to the risks involved. Therefore, written procedures should not be necessary if the UAS operator is also the remote pilot, and the remote pilot may use the procedures defined by the manufacturer in the operations manual (OM).

If a UAS operator employs more than one remote pilot, the UAS operator should:

(a) develop procedures for UAS operations in order to coordinate the activities between its employees; and

(b) establish and maintain a list of their personnel and their assigned duties.

GM1 UAS.OPEN.050(3) Responsibilities of the UAS operator

OPERATIONAL PROCEDURES

The UAS operator must identify a remote pilot for each flight. For UAS operations in the ‘open’ category, it is forbidden to hand the control of the UA over to another command unit during the flight.

AMC1 UAS.OPEN.050(4)(c) Responsibilities of the UAS operator

OBTAIN UPDATED INFORMATION ABOUT THE GEOGRAPHICAL ZONE

The UAS operator should download the latest version of the geographical data and make available to the remote pilot such that they can upload it onto the geo-awareness system, if such a system is available on the UA used for the operation.

UAS.OPEN.060 Responsibilities of the remote pilot

(1) Before starting an UAS operation, the remote pilot shall:

(a) have the appropriate competency in the subcategory of the intended UAS operations in accordance with points MCAR-UAS.OPEN.020, MCAR-UAS.OPEN.030 or MCAR-UAS.OPEN.040 to perform its task and carry a proof of competency while operating the UAS, except when operating an unmanned aircraft referred to in points (5)(a), (5)(b) or (5)(c) of point MCAR-UAS.OPEN.020;

(b) obtain updated information relevant to the intended UAS operation about any geographical zone published by the Member State of operation in accordance with First Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

(c) observe the operating environment, check the presence of obstacles and, unless operating in subcategory A1 with an unmanned aircraft referred to in points (5)(a), (5)(b) or (5)(c) of point MCAR-UAS.OPEN.020, check the presence of any uninvolved person;

(d) ensure that the UAS is in a condition to safely complete the intended flight, and if applicable, check if the direct remote identification is active and up-to-date;

(e) if the UAS is fitted with an additional payload, verify that its mass does not exceed neither the MTOM defined by the manufacturer or the MTOM limit of its class.

(2) During the flight, the remote pilot shall:

(a) not perform duties under the influence of psychoactive substances or alcohol or when it is unfit to perform its tasks due to injury, fatigue, medication, sickness or other causes;

(b) keep the unmanned aircraft in VLOS and maintain a thorough visual scan of the airspace surrounding the unmanned aircraft in order to avoid any risk of collision with any manned aircraft. The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property;

(c) comply with the operational limitations in geographical zones defined in accordance with the first Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

(d) have the ability to maintain control of the unmanned aircraft, except in the case of a lost link or when operating a free-flight unmanned aircraft;

(e) operate the UAS in accordance with manufacturer's instructions provided by the manufacturer, including any applicable limitations;

(f) comply with the operator's procedures when available;

(g) when operating at night, ensure that a green flashing light on the unmanned aircraft is activated.

(3) During the flight, remote pilots and UAS operators shall not fly close to or inside areas where an emergency response effort is ongoing unless they have permission to do so from the responsible emergency response services.

(4) For the purposes of point (2)(b), remote pilots may be assisted by an unmanned aircraft observer. In such case, clear and effective communication shall be established between the remote pilot and the unmanned aircraft observer.

GM1 UAS.OPEN.060(1)(b) Responsibilities of the remote pilot

OBTAINING UPDATED INFORMATION ABOUT ANY FLIGHT RESTRICTIONS OR CONDITIONS PUBLISHED BY THE AUTHORITY

Information on airspace structure and limitations, including limited zones for UA or no-UA zones, will be provided by the Authority in accordance with Regulation 8 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

AMC1 UAS.OPEN.060(1)(c) Responsibilities of the remote pilot

OPERATING ENVIRONMENT

(a) The remote pilot should observe the operating environment and check any conditions that might affect the UAS operation, such as the locations of people, property, vehicles, public roads, obstacles, aerodromes, critical infrastructure, and any other elements that may pose a risk to the safety of the UAS operation.

(b) Familiarisation with the environment and obstacles should be conducted, when possible, by walking around the area where the operation is intended to be performed.

(c) It should 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 compatible with those defined in the manufacturer's manual.

(d) The remote pilot should be familiar with the operating environment and the light conditions, and make a reasonable effort to identify potential sources of electromagnetic energy, which may cause undesirable effects, such as electromagnetic interference (EMI) or physical damage to the operational equipment of the UAS.

AMC1 UAS.OPEN.060(1)(d) Responsibilities of the remote pilot

UAS IN A SAFE CONDITION TO COMPLETE THE INTENDED FLIGHT

The remote pilot should:

(a) update the UAS with data for the geo-awareness function if it is available on the UA;

(b) ensure that the UAS is fit to fly and complies with the instructions and limitations provided by the manufacturer, or the best practice in the case of a privately built UAS;

(c) ensure that any payload carried is properly secured and installed and that it respects the limits for the mass and CG of the UA;

(d) ensure that the charge of the battery of the UA is enough for the intended operation based on:

(1) the planned operation; and

(2) the need for extra energy in case of unpredictable events; and

(e) for UAS equipped with a loss-of-data-link recovery function, ensure that the recovery function allows a safe recovery of the UAS for the envisaged operation; for programmable loss-of-data- link recovery functions, the remote pilot may have to set up the parameters of this function to adapt it to the envisaged operation.

GM1 UAS.OPEN.060(2)(a) and UAS.SPEC.060(1)(a) Responsibilities

OTHER CAUSES

'Other causes' means any physical or mental disorder or any functional limitation of a sensory organ that would prevent the remote pilot from performing the operation safely.

AMC1 UAS.OPEN.060(2)(b) Responsibilities of the remote pilot

VLOS RANGE

(a) The maximum distance of the UA from the remote pilot should depend on the size of the UA and on the environmental characteristics of the area (such as the visibility, presence of tall obstacles, etc.).

(b) The remote pilot should keep the UA at a distance such that they are always able to clearly see it and evaluate the distance of the UA from other obstacles. If the operation takes place in an area where there are no obstacles and the remote pilot has unobstructed visibility up to the horizon, the UA can be flown up to a distance such that the UA remain clearly visible. If there are obstacles, the distance should be reduced such that the remote pilot is able to evaluate the relative distance of the UA from that obstacle. Moreover, the UA should be kept low enough so that it is essentially 'shielded' by the obstacle, since manned aircraft normally fly higher than obstacles.

GM1 UAS.OPEN.060(2)(b) Responsibilities of the remote pilot

DISCONTINUATION OF THE FLIGHT IF THE OPERATION POSES A RISK TO OTHER AIRCRAFT

The rules put an obligation on the remote pilot to maintain a thorough visual scan of the airspace to avoid any risk of a collision with manned aircraft. This means that the remote pilot is primarily responsible for avoiding collisions. The reason is that the manned aircraft pilot(s) may not be able to see the UA due to its small size. Therefore, the remote pilot should make an evaluation of the risk of collision and take appropriate action.

As soon as the remote pilot sees another aircraft or a parachute or any other airspace user, they must immediately keep the UA at a safe distance from it and land if the UA is on a trajectory towards the other object.

For example, if the remote pilot sees a manned aircraft flying at very high altitude (i.e. an en route flight at a height of 1 km or more), since the pilot will always keep the UA below 120 m, they can continue the operation.

If the remote pilot observes an aircraft passing through the sky at a low altitude, at which it may interact with the UA, they need to immediately reduce the height of the UA (e.g. to less than 10 m above the ground) and keep the UA in an area that is far (not less than 500 m) from the other aircraft. If they cannot ensure such a distance, the UA needs to be immediately landed.

AMC1 UAS.OPEN.060(2)(d) Responsibilities of the remote pilot

ABILITY TO MAINTAIN CONTROL OF THE UA

(a) The remote pilot should:

(1) be focused on the operation of the UA, as appropriate;

(2) not operate a UA while operating a moving vehicle; and

(3) operate only one UA at a time.

(b) If the remote pilot operates a UA from a moving ground vehicle or boat, the speed of the vehicle should be slow enough for the remote pilot to maintain a VLOS of the UA, maintain control of the UA at all times and maintain situational awareness and orientation.

GM1 UAS.OPEN.060(2)(d) Responsibilities of the remote pilot

ABILITY TO MAINTAIN CONTROL OF THE UA

Autonomous operations are not allowed in the 'open' category, and the remote pilot must be able to take control of the UA at any time, except in the event of a lost-link condition or a free-flight UA.

GM2 UAS.OPEN.060(2)(d) Responsibilities of the remote pilot

FREE-FLIGHT UA

'Free flight' means performing flights with no external control, taking advantage of the ascending currents, dynamic winds and the performance of the model. Outdoor free

flights are carried out with gliders or with models equipped with means of propulsion (e.g. rubber-bands, thermal engines) that raise them in altitude, before they freely glide and follow the air masses.

GM1 UAS.OPEN.060(3) and UAS.SPEC.060(3)(e) Responsibilities of

EMERGENCY RESPONSE DEFINITION

'Emergency response' is an action taken in response to an unexpected and dangerous event in an attempt to mitigate its impact on people, property or the environment.

GM2 UAS.OPEN.060(3) and UAS.SPEC.060(3)(e) Responsibilities of the remote pilot

EMERGENCY RESPONSE EFFORT

When there is an emergency response effort taking place in the operational area of a UAS, the UAS operation should be immediately discontinued unless it was explicitly authorised by the responsible emergency response services. Otherwise, a safe distance must be maintained between the UA and the emergency response site so that the UA does not interfere with, or endanger, the activities of the emergency response services. The UAS operator should take particular care to not hinder possible aerial support and to protect the privacy rights of persons involved in the emergency event.

GM1 UAS.OPEN.060(4) Responsibilities of the remote pilot

ROLE OF THE UA OBSERVER AND FIRST PERSON VIEW

The remote pilot may be assisted by a UA observer helping them to keep the UA away from obstacles. The UA observer must be situated alongside the remote pilot in order to provide warnings to the remote pilot by supporting them in maintaining the required separation between the UA and any obstacle, including other air traffic.

UA observers may also be used when the remote pilot conducts UAS operations in first-person view (FPV), which is a method used to control the UA with the aid of a visual system connected to the camera of the UA. In any case, including during FPV operations, the remote pilot is still responsible for the safety of the flight.

As the UA observer is situated alongside the remote pilot and they must not use aided vision (e.g. binoculars), their purpose is not to extend the range of the UA beyond the VLOS distance from the remote pilot. Exceptions are emergency situations, for instance, if the pilot must perform an emergency landing far from the pilot's position, and binoculars can assist the pilot in safely performing such a landing.

UAS.OPEN.070 Duration and validity of the remote pilot online theoretical competency and certificates of remote pilot

(1) The remote pilot online theoretical competency, required by points (4)(b) of point MCAR-UAS.OPEN 020 and point (3) of point MCAR-UAS.OPEN.040, and the certificate of remote pilot competency, required by point (2) of point MCAR-UAS.OPEN.030, shall be valid for five years.

(2) The revalidation of the remote pilot online theoretical competency and of the certificate of remote pilot competency is, within its validity period, subject to:

(a) demonstration of competencies respectively in accordance with point (4)(b) of point MCAR-UAS.OPEN.020 or point (2) of point MCAR-UAS.OPEN.030; or

(b) the completion of a refresher training addressing respectively the theoretical knowledge subjects as defined in point (4)(b) of point MCAR-UAS.OPEN.020 or point (2) of point MCAR-UAS.OPEN.030 provided by the Authority or by an entity designated by the Authority.

(3) In order to revalidate the remote pilot online theoretical competency or the certificate of remote pilot competency upon its expiration, the remote pilot shall comply with point (2)(a).

UAS OPERATIONS IN THE 'SPECIFIC' CATEGORY

UAS.SPEC.010 General provisions

The UAS operator shall provide the Authority with an operational risk assessment for the intended operation in for the purpose of this MCAR, or submit a declaration when point MCAR-UAS.SPEC.020 is applicable, unless the operator holds a light UAS operator certificate (LUC) with the appropriate privileges, in accordance with Part C of this MCAR. The UAS operator shall regularly evaluate the adequacy of the mitigation measures taken and update them where necessary.

UAS.SPEC.020 Operational declaration

(1) In accordance with Regulation 11 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, the UAS operator may submit an operational declaration of compliance with a standard scenario as defined in Appendix 1 to this MCAR to the Authority as an alternative to points MCAR-UAS.SPEC.030 and MCAR-UAS.SPEC.040 in relation to operations:

(a) of unmanned aircraft with:

(i) maximum characteristic dimension up to 3 metres in VLOS over controlled ground area except over assemblies of people,

(ii) maximum characteristic dimension up to 1 metre in VLOS except over assemblies of people;

(iii) maximum characteristic dimension up to 1 metre in BVLOS over sparsely populated areas;

(iv) maximum characteristic dimension up to 3 metres in BVLOS over controlled ground area.

(b) performed below 120 metres from the closest point of the surface of the earth, and:

(i) in uncontrolled airspace (class F or G) unless different limitations are provided by the Authority through UAS geographical zones in areas where the probability of encountering manned aircraft is not low; or

(ii) in controlled airspace, in accordance with published procedures for the area of operation, so that a low probability of encountering manned aircraft is ensured.

(2) A declaration of UAS operators shall contain:

(a) administrative information about the UAS operator;

(b) a statement that the operation satisfies the operational requirement set out in point (1) and a standard scenario as defined in Appendix 1 to this MCAR;

(c) the commitment of the UAS operator to comply with the relevant mitigation measures required for the safety of the operation, including the associated instructions for the operation, for the design of the unmanned aircraft and the competency of involved personnel.

(d) confirmation by the UAS operator that an appropriate insurance cover will be in place for every flight made under the declaration, as required by the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

(3) Upon receipt of the declaration, the Authority shall verify that the declaration contains all the elements listed in point (2) and shall provide the UAS operator with a confirmation of receipt and completeness without undue delay.

(4) After receiving the confirmation of receipt and completeness, the UAS operator is entitled to start the operation.

(5) UAS operators shall notify, without any delay, the Authority of any change to the information contained in the operational declaration that they submitted.

(6) UAS operators holding an LUC with appropriate privileges, in accordance with Subpart C of this MCAR, are not required to submit the declaration.

UAS.SPEC.030 Application for an operational authorisation

(1) Before starting an UAS operation in the 'specific' category the UAS operator shall obtain an operational authorisation from the Authority, except:

(a) when point MCAR-UAS.SPEC.020 is applicable; or

(b) the UAS operator holds an LUC with the appropriate privileges, in accordance with Subpart C of this MCAR.

(2) The UAS operator shall submit an application for an updated operational authorisation if there are any significant changes to the operation or to the mitigation measures listed in the operational authorisation.

(3) The application for an operational authorisation shall be based on the risk assessment referred to in Regulation11 and shall include in addition the following information:

(a) the registration number of the UAS operator;

(b) the name of the accountable manager or the name of the UAS operator in the case of a natural person;

(c) the operational risk assessment;

(d) the list of mitigation measures proposed by the UAS operator, with sufficient information for the Authority to assess the adequacy of the mitigation means to address the risks;

(e) an operations manual when required by the risk and complexity of the operation;

(f) a confirmation that an appropriate insurance cover will be in place at the start of the UAS operations, if required by Union or national law.

AMC1 UAS.SPEC.030(2) Application for an operational

APPLICATION FORM FOR THE OPERATIONAL AUTHORISATION

The UAS operator should submit an application according to the following form. The application and all the documentation referred to or attached should be stored for two years in a manner that ensures their protection from unauthorised access, damage, alteration, and theft. The declaration may be complemented by the description of the procedures to ensure that all operations are in compliance with the Data Protection Act on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, as required by point MCAR-UAS.SPEC.050 (1)(a)(iv).

The operational authorisation application form is in the Subpart F of this MCAR.

Instructions for filling in the form

If the application relates to an amendment to an existing operational authorisation, indicate the number of the operational authorisation and fill out in red the fields that are amended compared to the last operational authorisation.

1.1 The UAS operator registration number in accordance with Regulation 7 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

1.2 . UAS operator’s name as declared during the registration process.

1.3 Name of the accountable manager or, in the case of a natural person, the name of the UAS operator.

1.4 Contact details of the person responsible for the operation, in charge to answer possible operational questions raised by the Authority.

2.1 Date on which the UAS operator expects to start the operation.

2.2 Date on which the UAS operator expects to end the operation. The UAS operator may ask for an unlimited duration; in this case, indicate 'Unlimited'.

2.3 Location(s) where the UAS operator intends to conduct the UAS operation. The identification of the location(s) should contain the full operational volume and ground risk buffer (the red line in Figure 1). Depending on the initial ground and air risk and on the application of mitigation measures, the location(s) may be 'generic' or 'precise' (refer to GM2 UAS.SPEC.030(2)).

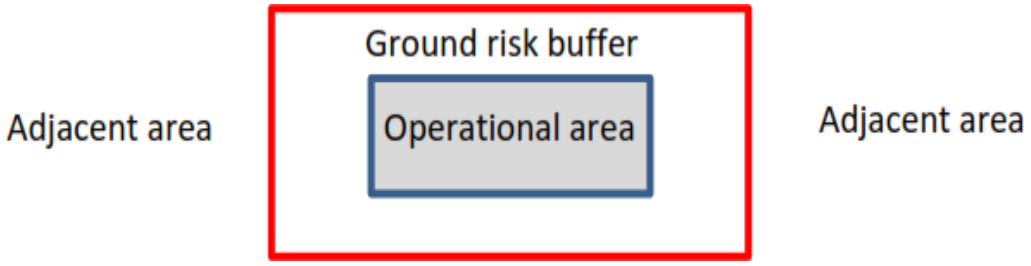


Figure 1 - Operational area and ground risk buffer

2.4 Select one of the three options. If the SORA is used, indicate the version. In case a PDRA is used, indicate the number and its revision. In case a risk assessment methodology is used other than the SORA, provide its reference. In this last case, the UAS operator should demonstrate that the methodology complies with Subpart D of this MCAR.

2.5 If the risk methodology used is the SORA, indicate the final SAIL of the operation, otherwise the equivalent information provided by the risk assessment methodology used.

2.6 Select one of the two options.

2.7 Select one of the two options.

2.8 Characterise the ground risk (i.e. density of overflown population density, expressed in persons per km^2, if available, or 'controlled ground area', 'sparsely populated area', 'populated area', 'gatherings of people') for both the operational and the adjacent area.

2.9 Insert the maximum flight altitude, expressed in metres and feet in parentheses, of the operational volume (adding the air risk buffer, if applicable) using the AGL reference when the upper limit is below 150 m (492 ft), or use the MSL reference when the upper limit is above 150 m (492 ft).

2.10 Select one or more of the nine options. Select 'Other' in case none of the previous applies (i.e. military areas).

2.11 Select one of the four options.

2.12 Indicate the OM's identification and revision number. This document should be attached to the application.

2.13 Indicate the compliance evidence file identification and revision number. This document should be attached to the application.

3.1 Name of the manufacturer of the UAS.

3.2 Model of the UAS as defined by the manufacturer.

3.3 Select one of the five options.

3.4 Indicate the maximum dimensions of the UA in metres (e.g. for aeroplanes: the length of the wingspan; for helicopters: the diameter of the propellers; for multirotors: the maximum distance between the tips of two opposite propellers) as used in the risk assessment to identify the ground risk.

3.5 Indicate the maximum value, expressed in kg, of the UA take-off mass (TOM), at which the UAS operation may be operated. All flights should then be operated not exceeding that TOM. The TOM may be different from (however, not higher than) the MTOM defined by the UAS manufacturer.

3.6 Maximum cruise airspeed, expressed in m/s and kt in parentheses, as defined in the manufacturer's instructions.

3.7 Unique serial number (SN) of the UA defined by the manufacturer according to standard ANSI/CTA-2063-A-2019, Small Unmanned Aerial Systems Serial Numbers, 2019, or UA registration mark if the UA is registered. In case of

privately built UAS or UAS not bearing a unique SN, insert the unique SN of the remote identification system.

3.8 Include the Type Certificate (TC) number, or the UAS design verification report number issued by the National Authority, if applicable.

3.9 If a UAS with an Type Certificate (TC) is required by the Authority, the UAS should have a certificate of airworthiness (CofA).

3.10 If a UAS with a Type Certificate (TC) is required by the Authority, the UAS should have a noise certificate.

3.11 Select one of the four options.

3.12 Select one of the two options.

4 Free-text field for the addition of any relevant remark.

Note 1: Section 3 may include more than one UAS. In that case, it should be filled in with the data of all the UASs intended to be operated. If needed, fields may be duplicated.

Note 2: The signature and stamp may be provided in electronic form.

AMC2 UAS.SPEC.030(2) Application for an operational authorisation

SIGNIFICANT CHANGES TO THE OPERATIONAL AUTHORISATION

(a) Any non-editorial change that affects the operational authorisation, or affects any associated documentation that is submitted to demonstrate compliance with the requirements established for the authorisation, should be considered to be a significant change.

(b) With regard to the information and documentation associated with the authorisation, changes should be considered to be significant when they involve, for example:

(1) changes in the operations that affect the assumptions of the risk assessment;

(2) changes that relate to the management system of the UAS operator (including changes of key personnel), its ownership or its principal place of business;

(3) non-editorial changes that affect the operational risk assessment report;

(4) non-editorial changes that affect the policies and procedures of the UAS operator; and

(5) non-editorial changes that affect the OM (when required).

GM1 UAS.SPEC.030(2) Application for an operational authorisation

APPLICATION FORM FOR THE OPERATIONAL AUTHORISATION

Depending on the level of the risk of the operation, the technical characteristics of the UAS may play an important role in mitigating the risk. In that case, the UAS operator may provide additional information to the Authority on the characteristics of the UAS to be operated. The Authority will, in any case, ask for additional data when needed.

As an example regarding how to structure the additional information, the UAS operator may supplement the application for the authorisation with the additional elements shown below. Elements from the example may be added or removed as required.

(1) PAINT

Describe any painted elements that are visible (marks) and significant (colour, shape, etc.).

(2) LIGHTS

Describe the lights, including their colours and locations.

(3) PROPULSION

Mark the type of propulsion used, indicating (in the space provided) the manufacturer and model, and detailing relevant information such as the number of motors/engines, the configuration, etc. Powerplant design diagrams may be attached if necessary.

(4) CONTROL AND/OR POSITIONING SYSTEM

As a general instruction for this section, in addition to the description and information deemed necessary to define these systems, provide any certification and rating for the systems, such as those related to electromagnetic compatibility or any other European Directive satisfied by the equipment installed on the aircraft, for consideration during the specific risk assessment conducted using the specific operations risk assessment (SORA) or any other SMS methodology to evaluate and authorise operations.

(5) FLIGHT CONTROLLER

Indicate the manufacturer and model of the flight controller. Describe the relevant aspects affecting flight safety.

(6) FLIGHT TERMINATION SYSTEM

Describe and include the technical characteristics of the system, its modes of operation, system activation and any certification and rating for the components, as well as proof of its electromagnetic compatibility for consideration during the SORA or any other SMS methodology that is followed to evaluate and authorise operations.

(7) FLIGHT MODES

Describe the flight modes (i.e. manual, artificial stability with controller, automatic, autonomous). For each flight mode, describe the variable that controls the aircraft: increments in position, speed control, attitude control, type of altitude control (which sensor is used for this purpose), etc.

(8) GROUND CONTROL STATION

For 'encrypted' links, describe the encryption system used, if any.

(9) PAYLOAD

Describe each of the different payload configurations that affect the mission or that, without changing it, impact the weight and balance, the electrical charge or the flight dynamics. Include all relevant technical details. If needed, you may use other documents that provide the specified details.

(10) OPERATION LIMITS

Describe in this section the maximum operating height, the maximum airspeed (including Vmax ascent, Vmax descent and Vmax horizontal), and, in addition, the meteorological limit conditions in which the UAS can operate (e.g. rain, maximum wind, etc.)

(11) SAFETY SYSTEMS/SAFETY NETS AND AWARENESS

Describe the systems or equipment installed on the aircraft to mitigate potential operational safety risks, whether included in the form or not.

GM2 UAS.SPEC.030(2) Application for an operational authorisation

'GENERIC' VERSUS 'PRECISE' OPERATIONAL AUTHORISATION

For the purpose of Regulation 11 to the Civil Aviation (Unmanned Aircraft System) Regulations 2024. The Authority may decide to grant a 'generic' operational authorisation, i.e. an operational authorisation that is applicable to an indefinite number of flights taking place in locations generically identified, during the period of

validity of the operational authorisation. (Contrary to the 'generic' operational authorisation, an operational authorisation that is limited to the number of flights and/or to known locations identified by geographical coordinates will be called 'precise' operational authorisation.)

CONDITIONS FOR ISSUING A 'GENERIC' OPERATIONAL AUTHORISATION

A 'generic' operational authorisation does not contain any precise location (geographical coordinates) but applies to all locations that meet the approved conditions/limitations (e.g. density of population of the operational and adjacent area, class of airspace of the operational and adjacent area, maximum height, etc.). The UAS operator is responsible for checking that each flight they conduct:

— meets the mitigations and operational safety objectives derived from the SORA and the requirements listed in the operational authorisation; and

— takes place in an area whose characteristics and local conditions are consistent with the GRC and ARC classification of the SORA as approved by the Authority.

The UAS operator should anyhow check whether the Authority has published a geographical zone in the area of operation according to Regulation 18 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, requiring a flight authorisation (e.g. this may be the case for the areas covered by U-Space if defined and implemented). A flight authorisation should not be confused with an operational authorisation.

The criteria to determine whether a UAS operator is eligible for a 'generic' operational authorisation are the following:

1. The limitations regarding the operational scenario, the operational volume and the buffers defined by the operational authorisation are expressed in such a way that it is simple for the UAS operator to ensure compliance with those limitations.

It will usually be easier for the UAS operator to ensure compliance when the conditions are unambiguous and not open to interpretation. This is the case, for instance, when:

— a controlled ground area is required, or the density of population is very low;

— the operation takes place in segregated airspace.

In this regard, ‘generic’ operational authorisations may be relevant for operations conducted according to PDRA-Sxx, since the conditions are similar to the ones of the declarative STS and it is relatively easy for the UAS operator to ensure compliance with those conditions.

As a rule of thumb, a ‘precise’ operational authorisation rather than a ‘generic’ one may be more appropriate when the iGRC ≥ 4 or the iARC ≥ ARC-c.

2. The strategic mitigation measures, if any, are not open to interpretation or difficult to implement.

The use of some strategic measure mitigation (M1 for GRC or Step 5 for ARC) often prompt debate between the UAS operator and the Authority regarding the relevance/validity of the data sources (density of population, density/type of traffic in given airspace, etc.), and the efficiency of the proposed strategic mitigation measures. Furthermore, some of these measures are difficult to implement and it is not always possible for the Authority to simply trust the capacity of the UAS operator to do so.

For instance, the following examples show measures that are difficult to implement / open to interpretation:

— achieving a local reduction of the density of population;

— ensuring the absence of uninvolved persons in very large, controlled ground areas, or reserving large, controlled ground areas in densely populated environments;

— starting an operation in airspace that requires a new protocol with the ANSP/ATSP, etc.

Note: In the future, qualified service for strategic deconfliction (U-space) may be a valid mitigation measure for a ‘generic’ operational authorisation.

3. The Authority has assessed the capacity of the UAS operator to identify/assess the local conditions The UAS operator should have a diligent and documented process to identify/assess the local conditions and their compliance to the limitations given by the authorisation (in the operations manual (OM)). The UAS

operator should train its personnel to assess the operational volume, buffers and mitigations in order to prepare for the next operations. The UAS operator should also document and record the assessment of locations (e.g. in mission files), so that adherence to this process can be verified by the NAA on a regular basis.

For simple operations where Criteria 1 and 2 are met, the Authority may decide to issue the 'generic' operational authorisation first and assess the robustness of the procedures through continuous oversight.

For complex operations where Criteria 1 and 2 are not met, then the third criterion is paramount. While the Authority may be confident enough to directly issue a 'generic' operational authorisation, it may also decide to add some restrictions for the locations that are valid for the first one (or more) operations. The UAS operator should provide evidence to the Authority that the process defined in Criterion 3 has been followed, and the area and local conditions identified by the UAS operator comply with the authorisation. The Authority will review the evidence (as for a 'precise' authorisation) and confirm in written to the operator that their analysis is satisfactory.

Once the Authority has enough evidence or confidence that the UAS operator is able to complete the assessments on its own, the restrictions on the location may be withdrawn.

Eventually, a LUC may be appropriate to demonstrate this capacity (see below).

DIFFERENCES BETWEEN A 'GENERIC' OPERATIONAL AUTHORISATION AND A LUC

An operational authorisation where the locations are generically identified may to some extent be traced to some privileges granted to a LUC holder: the UAS operator can schedule new flights without receiving a new operational authorisation for each of them. However, a LUC offers more flexibility than a generic operational authorisation by allowing a UAS operator to have different level of privileges, including the possibility to start new types of operations or use previously non-validated types of UASs.

On the other hand, a 'generic' operational authorisation does not require the UAS operator to formally implement a management system. Such a management system would be disproportionate for low-risk operations (such as PDRA-Sxx) (see Criterion 2). However, the more requirements are derived from the SORA and the conditions of the operational authorisations are difficult to check and to comply with, the more robust and reliable the processes and the organisation of the UAS operator need to be to ensure the absence of deviation.

Eventually, a LUC becomes necessary when the risk of deviation from these procedures is high and when deviating from the validated conditions greatly increases the risk of the operation. The LUC management system will be needed to ensure compliance with the procedures of the UAS operator through an independent process.

In this regard, a LUC may be more relevant than a 'generic' operational authorisation in the following cases:

— for SAIL ≥ 4 operations (due to OSO#1 'Ensure the UAS operator is competent and/or proven' with a 'high' level of robustness); or

— for SAIL ≥ 3 operations, when strategic ground risk mitigation (M1) or strategic air risk mitigation (Step 5) is applied, to make sure that the applicant exhibits the right safety culture to perform a location risk assessment.

AMC1 UAS.SPEC.030(3)(e) Application for an operational

OPERATIONS MANUAL — TEMPLATE

When required in accordance with MCAR-UAS.SPEC.030(3)(e), the OM should contain at least the information listed below, if applicable, customised for the area and type of operation.

0. Cover and contact.

0.1 Cover identifying the UAS operator with the title 'Operations Manual', contact information and OM revision number.

0.2 Table of contents.

1. Introduction

1.1 Definitions, acronyms and abbreviations.

1.2 System for amendment and revision of the OM (list the changes that require prior approval and the changes to be notified to the Authority).

1.3 Record of revisions with effectivity dates.

1.4 List of effective pages (list of effective pages unless the entire manual is re-issued and the manual has an effective date on it).

1.5 Purpose and scope of the OM with a brief description of the different parts of the documents.

1.6 Safety statement (include a statement that the OM complies with the relevant requirements of Regulation 11 and this MCAR and with the authorisation or the terms of approval of the light UAS operator certificate (LUC), in the case of a LUC holder, and contains instructions that are to be complied with by the personnel involved in flight operations).

1.7 Approval signature (the accountable manager must sign this statement).

2. Description of the UAS operator's organisation (include the organigram and a brief description thereof).

3. Concept of operations (ConOps)

For each operation, please describe the following:

3.1 Nature of the operation and associated risks (describe the nature of the activities performed and the associated risks).

3.2 Operational environment and geographical area for the intended operations (in general terms, describe the characteristics of the area to be overflown, its topography, obstacles etc., and the characteristics of the airspace to be used, and the environmental conditions (i.e. the weather and electromagnetic environment); the definition of the required operation volume and risk buffers to address the ground and air risks).

3.3 Technical means used (in general terms, describe their main characteristics, performance and limitations, including UAS, external systems supporting the UAS operation, facilities, etc.)

3.4 Competency, duties and responsibilities of personnel involved in the operations such as the remote pilot, UA observer, visual observer (VO), supervisor, controller, operations manager, etc. (initial qualifications; experience in operating UAS; experience in the particular operation; training and checking; compliance with the applicable regulations and guidance to crew members concerning health, fitness for duty and fatigue; guidance to staff on how to facilitate inspections by personnel of the Authority.

3.5 Risk analysis and methods for reduction of identified risks (description of methodology used; bow-tie presentation or other).

3.6 Maintenance (provide maintenance instructions required to keep the UAS in a safe condition, covering the UAS manufacturer's maintenance instructions and requirements when applicable).

4. Normal procedures;

(The UAS operator should complete the following paragraphs considering the elements listed below. The procedures applicable to all UAS operations may be listed in paragraph 4.1.)

4.1 General procedures valid for all operations

4.2 Procedures peculiar to a single operation

5. Contingency procedures

(The UAS operator should complete the following paragraphs considering the elements listed below. The procedures applicable to all UAS operations may be listed in paragraph 5.1).

5.1 General procedures valid for all operations

5.2 Procedures peculiar to a single operation

6. Emergency procedures

(The UAS operator should define procedures to cope with emergency situations.)

7. Emergency response plan (ERP) (optional)

8. Security (security procedures referred to in MCAR-UAS.SPEC.050(a)(ii) and (iii); instructions, guidance, procedures, and responsibilities on how to implement security requirements and protect the UAS from unauthorised modification, interference, etc.)

9. Guidelines to minimise nuisance and environmental impact referred to in MCAR-UAS.SPEC.050(a)(v);

10. Occurrence reporting procedures according to UAS.LUC.030.

11. Record-keeping procedures (instructions on logs and records of pilots and other data considered useful for the tracking and monitoring of the activity).

AMC2 UAS.SPEC.030(3)(e) Application for an operational

OPERATIONAL PROCEDURES WITH 'MEDIUM' AND 'HIGH' LEVEL OF ROBUSTNESS

1. Scope of this AMC

1.1 This AMC addresses the criteria for the medium and high level of robustness of the operational procedures that are required under the following OSOs:

(a) OSO #08: Technical issue with the UAS — Operational procedures are defined, validated and adhered to;

(b) OSO #11: Deterioration of the external systems that support the UAS operations — Procedures are in place to handle the deterioration of the external systems that support the UAS operations;

(c) OSO #14: Human error — Operational procedures are defined, validated and adhered to; and

(d) OSO #21: Adverse operating conditions — Operational procedures are defined, validated and adhered to.

These criteria may be used to also address the criteria for the medium and high levels of robustness of the operational procedures required under the mitigation means, which are defined in Annex B of Subpart D of this MCAR.

2. Criteria for the level of integrity

2.1. Criterion #1: Procedure definition

2.1.1. Annex E of Subpart D OF THIS MCAR provides the minimum elements that the operational procedures need to appropriately cover for the intended operations.

2.1.2. AMC1 UAS.SPEC.030(3)(e) on the OM template 1 for the operational authorisation of UAS operations in the 'specific' category and the corresponding guidance in GM1 UAS.SPEC.030(3)(e) should be followed to define the procedures, as they provide more details on the elements that are referred to in point 2.1.1.

2.2. Criterion #2: Procedure complexity

2.2.1. Based on the SORA criterion of 'procedure complexity' for a low level of integrity, procedures with a higher level of integrity should not be complex. This implies that the workload and/or the interactions with other entities (e.g. air traffic management (ATM), etc.) of remote pilots and/or other personnel in charge of duties essential to the UAS operation should be limited to a level that may not jeopardise their ability to adequately follow the procedures.

2.2.2. Procedures should be validated in accordance with point 3.5.

2.3. Criterion #3: Consideration of potential human error

Operational procedures should be developed to minimise human errors:

(a) each of the tasks and the complete sequence of the tasks of a procedure should be intuitive, unambiguous, and clearly defined;

(b) the tasks should be clearly assigned to the relevant roles and persons, ensuring a balanced workload (see point 2.2); and

(c) the procedures should adequately address fatigue and stress, considering, among other aspects, the following: duty times, regular breaks, rest periods, the applicable health and safety requirements in the operational environment, handover/takeover procedures, responsibilities, and workload.

3. Criteria for the level of assurance

3.1. The purpose of the validation process described in this AMC is to confirm whether the proposed operational procedures are complete and adequate to ensure the safe conduct of the intended UAS operations.

3.2. The validation process should include the following:

(a) a review of the completeness of the procedures to ensure that:

(1) all elements that are indicated in points 2.1.1 and 2.1.2 have been addressed; and

(2) all relevant references have been considered, including but not limited to:

(i) the applicable regulations;

(ii) the requirements from the Authority and/or other relevant authorities or entities;

(iii) the local requirements and conditions;

(iv) the available recommended practices for the intended type of UAS operations;

(v) the instructions from the UAS manufacturer and of any other UAS equipment manufacturer, if applicable;

(vi) the instructions and requirements from externally provided services that support the UAS operations, if applicable;

(vii) the results from previous experience, including tests and/or simulations as those indicated in point (c) and (d); and

(viii) consensus-based voluntary industry standards;

(b) an expert judgement to assess the adequacy of the procedures based on:

(1) the objective(s) of each procedure;

(2) relevant key performance parameters/indicators and/or benchmarking of options, if applicable;

(3) an assessment of the procedures' complexity in accordance with point 2.2; and

(4) an assessment of the effect of human factors on procedures in accordance with point 2.3;

(c) a proof of the adequacy of the procedures through tests or practical exercise for phases of the UAS operation other than the UA flight, which involve the UAS and/or any external system that supports the operation;

(d) a proof of the adequacy of the contingency and emergency procedures through:

(1) dedicated flight tests conducted in an area with reduced air and ground risk and/or representative subsystems tests; or

(2) simulation, provided it is proven valid for the intended purpose with positive results; or

(3) any other means acceptable to the Authority that issues the authorisation;

(e) if the option in point (d)(3) is selected, a substantiation of the suitability of those means for proving the adequacy of the procedures;

(f) a record of proof of the adequacy of the procedures, including at least:

(1) the UAS operator's name and registration number;

(2) the date(s) and place(s) of tests or simulations;

(3) identification of the means used, e.g. for tests or simulations that use actual UASs: the type category, the name of the manufacturer, and the model and serial number of each UA used;

(4) a description of tests or simulations conducted, including their purpose, the expected results (including key performance parameters/indicators, where relevant), how they were conducted, the results obtained, and conclusions; and

(5) the signature of the person that is appointed by the UAS operator to conduct the tests or simulations;

(g) for UAS operations that require a high level of assurance, the procedures and the dedicated flight tests, simulations, or other means acceptable to the Authority, which are indicated in point 3.2, validated by the Authority that issues the authorisation or by an entity that is recognised by the Authority.

3.3. The following conditions apply to the dedicated flight tests that are indicated in point 3.2(d)(1):

(a) the configuration of the UAS hardware and software should be identified;

(b) the UAS operator should conduct the dedicated flight tests;

(c) if no simulations as the ones indicated in point 3.2(d)(2) are conducted, the dedicated flight tests should cover all the relevant aspects of the contingency and emergency procedures;

(d) for UAS operations that require a high level of assurance, the dedicated flight tests that are performed to validate the procedures and checklists should cover the complete flight envelope or prove to be conservative;

(e) the UAS operator should conduct as many flight tests as agreed with the Authority to prove the adequacy of the proposed procedures;

(f) the dedicated flight tests should be conducted in a safe environment (reducing the ground and air risks to the greatest extent possible), while ensuring the representativeness of the tests' results for the intended UAS operations; and

(g) the UAS operator should record the flight tests as part of the information to be recorded as per point UAS.SPEC.050(1)(g), e.g. in a logbook, as indicated in AMC1 UAS.SPEC.050(1)(g); such a record should include any potential issues identified.

3.4. To ensure that the integrity criterion of point 2.2 is met, the complexity of the procedures should be validated.

3.4.1. This validation should include:

(a) an expert judgement, as indicated in point 3.3(b); and

(b) a proof of the adequacy of the procedures, as indicated in point 3.3(c) and (d).

3.4.2. The UAS operator should adopt a method for the evaluation of the complexity of the procedures by the relevant personnel, i.e. the remote pilot and/or other personnel in charge of duties essential to the UAS operation. That method

should be adequate for the evaluation of the workload that is required by the task(s) of each procedure.

For example, a suitable method for evaluating the workload of the remote pilot and/or other personnel in charge of duties essential to the UAS operation may be the ‘Bedford Workload Scale’, which was conceived as a qualitative and relatively simple methodology for rating the pilots’ workload that is associated with the design of an aircraft’s human–machine interface (HMI). However, this methodology is deemed to be adequately generic to be also applicable to the tasks associated with the operational procedures to be conducted by remote pilots and/or other personnel in charge of duties essential to the UAS operation.

Figure 2 depicts the Bedford Workload Scale adapted to operational procedures for UAS operations: ‘pilot’ is replaced by ‘remote crew member’ (i.e. the remote pilot or other personnel in charge of duties essential to the UAS operation), and ‘pilot decision’ is replaced by ‘remote crew member performs a procedure task’. A procedure may include one or more tasks.

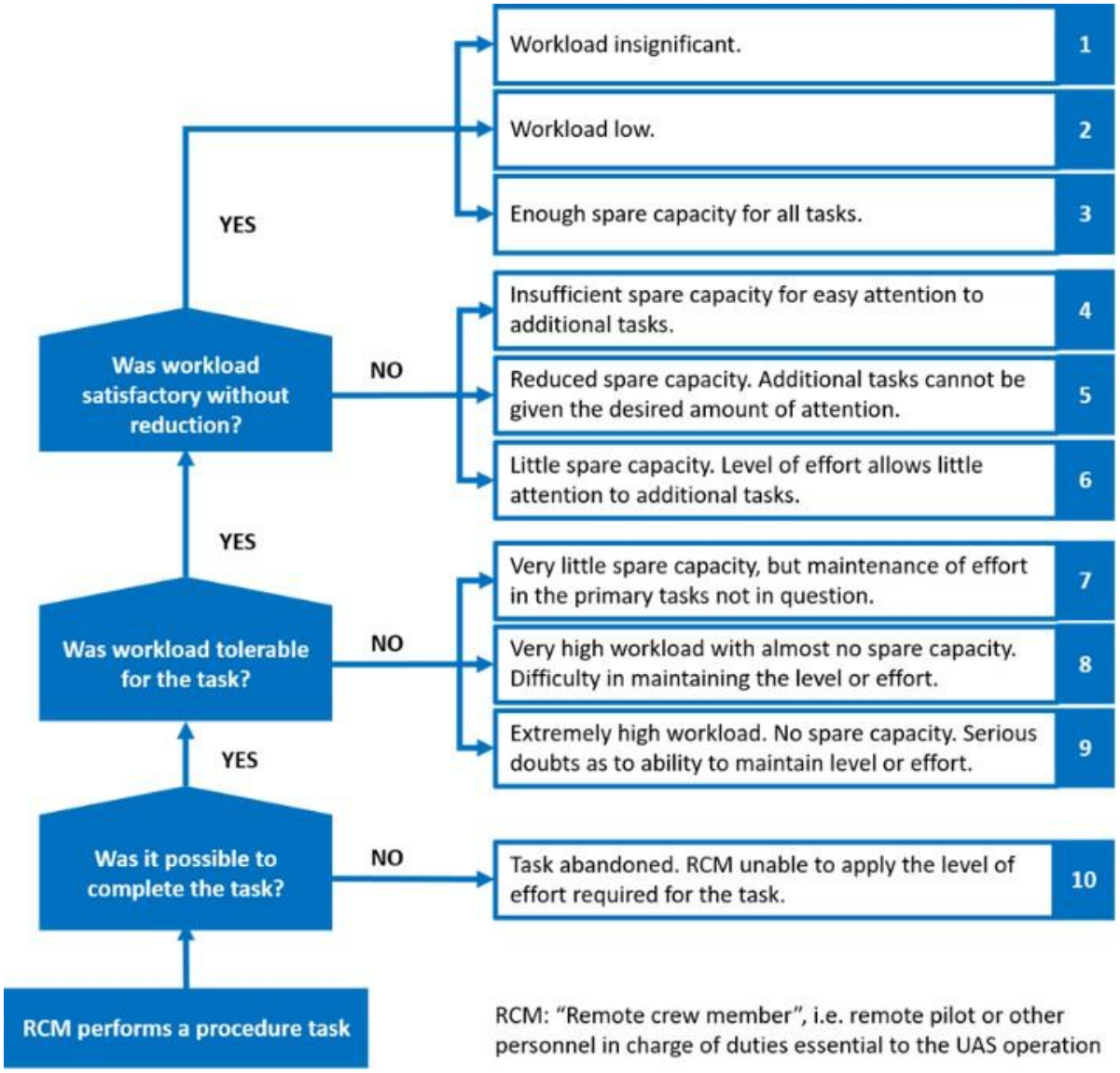


Figure 2 - Bedford Workload Scale adapted to operational procedures for UAS operations

AMC3 UAS.SPEC.030(3)(e) Application for an operational

EMERGENCY RESPONSE PLAN (ERP) WITH 'MEDIUM' AND 'HIGH' LEVEL OF ROBUSTNESS

1. Scope of this AMC

1.1 This AMC defines the content of an ERP as well as the methodology for its validation. It may be used to meet Criterion #1 (Procedures) of Mitigation M3 — An ERP is in place, UAS operator validated and effective of Annex B to Subpart D of this MCAR for medium and high level of robustness.

1.2 The risk assessment, as required by Subpart D of this MCAR, should address the safety risks that are associated with the loss of control of a UAS operation, which may result in:

(a) fatal injuries to third parties on the ground;

(b) injuries to third parties in the air; or

(c) damage to critical infrastructure.

Note: As per point B.4 of Annex B to AMC1 of Subpart D of this MCAR, the loss of control of a UAS operation corresponds to situations where the emergency procedures would not have provided the desired effect, the UAS operation is in an unrecoverable state, and:

— the outcome of the situation relies highly on providence; or

— the situation could not be handled via a contingency procedure; or

— there is a grave and imminent danger of fatalities.

1.3. Therefore, in line with the risk assessment, the scope of this AMC is limited to addressing the response to emergency situations that are caused by the UAS operation, as well as the potential consequences that are indicated in point 1.2. However, the response to such emergency situations should not be limited to the potential risk/harm only to third parties but also to the UAS operator's personnel.

1.4. This AMC does not address emergency situations other than those referred to in point 1.3. However, the UAS operator may be required to address such situations as part of the operational authorisation

2. Purpose of the ERP

2.1. The UAS operator should, in cooperation with other stakeholders, if applicable, develop, coordinate, and maintain an ERP that ensures orderly and safe transition from normal operation to emergency and return to normal operation. The ERP should include the actions to be taken by the UAS operator or specified individuals in an emergency, and indicate the size, nature, and complexity of the activities to be performed by the UAS operator or the specified individuals.

2.2. As for emergency procedures, an ERP is implemented by the UAS operator to address emergency situations. However, an ERP is specifically developed to:

(a) limit any escalating effect of the emergency situation;

(b) meet the conditions to alert the relevant authorities and entities.

2.3. The ERP should contain all the necessary information about the role of the relevant personnel in an emergency and about their response to it.

3. Effectiveness of the ERP

3.1. For the ERP to be effective, it should:

(a) be appropriate to the size, nature, and complexity of the UAS operation;

(b) be readily accessible by all relevant personnel and by other entities, where applicable;

(c) include procedures and checklists relevant to different or specific emergency situations;

(d) clearly define the roles and responsibilities of the relevant personnel;

(e) have quick-reference contact details of the relevant personnel;

(f) be regularly tested through practical exercises involving the relevant personnel; and

(g) be periodically reviewed and updated, when necessary, to maintain its effectiveness.

4. Emergency situations, response activation, procedures, and checklists

4.1. The ERP should define the criteria for identifying emergency situations, and for identifying the main emergency situations that are likely to increase the level of harm (escalating effect) if no action is taken.

4.2. The identified emergency situations should at least include those where one or more UA are operated by the UAS operator and have the potential to:

(a) harm one or more persons;

(b) hit a ground vehicle, building, or facility where there are one or more persons who might be injured as a consequence of the UA impact;

(c) harm critical infrastructure;

(d) start a fire that might propagate;

(e) release dangerous substances;

(f) hit an aircraft that carries people and/or whose crash might lead to one or more of the situations listed in (a) to (e); and

(g) cause the UA to leave the operational volume and fly beyond the limits of:

(1) the ground risk buffer; and/or

(2) the air risk buffer (if existing), or enter adjacent airspace where there is a risk of collision with manned aircraft.

4.3. The ERP should establish the criteria for the activation of the respective emergency response procedures to address the identified emergency situations.

4.4. The ERP should consider the following principles for prioritising the actions to respond to an emergency situation:

(a) alert the relevant personnel and entities;

(b) protect the life of those affected or in danger;

(c) give first aid while awaiting the arrival of the emergency services, provided the personnel employed by the UAS operator is qualified for that purpose;

(d) ensure the safety of the emergency responders;

(e) address secondary effects and put in place actions to reduce them (e.g. if the UA crashes on a road, warn the other drivers in the traffic or redirect them accordingly in order to avoid having cars colliding with the crashed UAS);

(f) keep the emergency situation under control or contained;

(g) protect property;

(h) restore the normal situation as soon as practicable;

(i) record the emergency situation and the response to it, and preserve evidence for further investigation;

(j) remove damaged items, unless needed untouched for investigation purposes, and restore the location of the emergency;

(k) debrief the relevant personnel;

(l) prepare any required post-emergency report or notification; and

(m) evaluate the effectiveness of the ERP and update it, if required.

4.5. As a minimum, the ERP should include procedures for:

(a) an orderly transition from the normal phase to the emergency response phase;

(b) the assignment of emergency responsibilities and roles (see point 5);

(c) coordinated action and interaction with other entities to respond to the emergency situation; and

(d) return to normal operation as soon as practicable.

4.6. The ERP should include a procedure for recording the information on the emergency situation and on the subsequent response. That procedure should also cover how to gather information from a third party that reports an emergency situation caused by a UA of the UAS operator.

4.7. The ERP should include procedures for handling hazardous materials in an emergency situation, if applicable.

4.8. The ERP should include checklists that:

(a) are suitable for the identified emergency situations, as per point 4.1;

(b) clearly indicate the sequence of actions and the personnel responsible to carry out those actions; and

(c) provide the contact details of key stakeholders, as per point 5.4.

4.9. The content of the ERP should be kept up to date and reflect all organisational or operational changes that may affect it.

5. Roles, responsibilities, and key points of contact

5.1. The UAS operator should nominate an emergency response manager (ERM) who has the overall responsibility for the emergency response.

5.2. If the UAS operator is not a one-person entity and/or manages external personnel in an emergency response, the UAS operator should establish an emergency response team (ERT) that:

(a) is led by the ERM;

(b) includes a core ERT that comprises persons with a role that implies being directly involved in responding to an emergency situation; and

(c) includes, if applicable, a support ERT that comprises ERT members who support the core ERT in responding to the emergency situation.

5.3. The ERP should provide a clear delineation of the responsibilities in an emergency response, including the duties of the remote pilot(s) and of any other personnel in charge of duties essential to the UAS operation.

5.4. The ERP should establish a contact list(s) of key staff, relevant authorities, and entities involved in an emergency response, including:

(a) the full names, roles, responsibilities, and contact details of the ERM and, if applicable, of the ERT members, including their replacement if the nominated persons are unavailable; and

(b) the full names, roles, responsibilities, and contact details of the relevant authorities and entities outside the UAS operator to be contacted in case of emergency; in addition, the single National emergency call number ‘112’ should be indicated as an emergency contact number for UAS operations that are conducted in any Part of the Republic of Mauritius .

5.5. The ERP should indicate the person(s) responsible for the emergency response means (refer to point 6.2) and their contact details. The responsible person(s) should ensure that those means are available and usable when needed.

5.6. To ensure a prompt response, the ERM and other ERT members, if applicable, should have direct access to:

(a) the emergency response checklists that are indicated in point 4.8; and

(b) if not included in the checklists referred to in (a), the contact list(s) indicated in point 5.4.

6. Emergency response means

6.1. The ERP should indicate the means to be used by the UAS operator to respond to an emergency, which may include one or more of the following:

(a) facilities, infrastructure, and equipment;

(b) extinguishing means, e.g. fire extinguishers, fireproof portable electronic device (PED) bags;

(c) personal protective equipment, e.g. protective clothing, high-visibility clothing, helmets, goggles, gloves;

(d) medical means, including first-aid kits;

(e) communication means, e.g. phones (landline and mobile), walkie-talkies, aviation radios, internet; and

(f) others.

6.2. The person(s) in charge of the emergency response means should have an updated record of the available means that are indicated in point 6.1, including their number and status (e.g. expiry date of perishable means).

7. ERP validation

7.1. If the UAS operator is a one-person entity and does not manage external personnel in an emergency response, the UAS operator should at least ensure that:

(a) the procedures that are indicated in point 4 cover all the identified emergency situations and that the necessary actions are reflected in the corresponding checklist(s);

(b) the contact details in the list(s) indicated in point 5.4 are up to date; and

(c) the availability of the emergency response means that are indicated in point 6 is checked before conducting any UAS operation, in particular that the communication means to alert the relevant contacts (see point (b)) are operational.

7.2. If the UAS operator is not a one-person entity and/or manages external personnel in an emergency response, in addition to complying with point 7.1, the UAS operator should conduct a tabletop exercise that:

(a) is established in accordance with the criteria that are indicated in the ERP to be considered representative;

(b) is consistent with the ERP training syllabus;

(c) includes sessions where one or more scenarios of the identified emergency situations are discussed by the exercise participants, which should include the relevant ERT members for each of the sessions; all aspects of the ERP should be covered once all sessions of the tabletop exercise have been completed;

(d) is guided by the ERM or any other person designated by the UAS operator to act as a facilitator;

(e) may include the participation of third parties that are identified in the ERP; the participation conditions for those third parties should be indicated in the ERP; and

(f) is performed with the periodicity that is indicated in the ERP.

However, if the UAS operator is a one-person entity and does not manage external personnel in an emergency response, a tabletop exercise may not be appropriate as the participation of third parties is not required. In such case, the conditions of point 7.1 are deemed sufficient and proportionate to the level of simplicity of the operator and, in principle, of the UAS operations.

For UAS operators with a more complex structure as well as for complex UAS operations, the tabletop exercises may need to be complemented with partial emergency exercises and/or full-scale exercises, including the corresponding drills. If the level of robustness that is required or claimed for the ERP is high, such exercises and drills are needed.

7.3. If the level of robustness of the ERP is high:

(a) the ERP and its effectiveness with respect to limiting the number of people at risk should be validated by the Authority itself or by an entity designated by the Authority;

(b) the UAS operator should coordinate and agree on the ERP with all third parties that are identified in the plan; and

(c) the representativeness of the tabletop exercise is validated by the Authority that issues the authorisation or by an entity that is designated by that Authority.

7.4. After following the procedures that are described in the ERP in a real emergency situation, the UAS operator should conduct an analysis of the way the emergency was managed and verify the effectiveness of the ERP.

8. ERP training

8.1. The UAS operator should provide relevant personnel, and in particular ERT members, with ERP training.

8.2. The UAS operator should develop a training syllabus that covers all the elements of the ERP.

8.3. The UAS operator should compile and keep up to date a record of the ERP training that is completed by the relevant personnel.

8.4. The Authority that issues the authorisation or an entity that is designated by that Authority should verify the competencies of the relevant personnel if the level of assurance that is required or claimed for the ERP is high.

GM1 UAS.SPEC.030(3)(e) Application for an operational

OPERATIONS MANUAL — TEMPLATE

A non-exhaustive list of topics to be considered by the UAS operator when compiling some chapters of the OM is provided below:

'1.2 System for amendment and revision of the OM'

(a) A description of the system for indicating changes and of the methodology for recording effective pages and effectivity dates; and

(b) Details of the person(s) responsible for the revisions and their publication.

'2 Description of the UAS operator's organisation'

(a) The organisational structure and designated individuals. Description of the operator's organisational structure, including an organisational chart showing the different departments, if any (e.g. flight/ground operations, operational safety, maintenance, training, etc.) and the head of each department;

(b) Duties and responsibilities of the management personnel; and

(c) Duties and responsibilities of remote pilots and other members of the organisation involved in the operations (e.g. payload operator, ground assistant, maintenance technician, etc.).

'3.4 Competency, duties and responsibilities of personnel involved in the operations such as the remote pilot, UA observer, VO, supervisor, controller, operations manager etc.'

(a) Theoretical, practical (and medical) requirements for operating UAS in compliance with the applicable regulation;

(b) Training and check programme for the personnel in charge of the preparation and/or performance of the UAS operations, as well as for the VOs, when applicable;

(c) Training and refresher training records; and

(d) Precautions and guidelines involving the health of the personnel, including precautions pertaining to environmental conditions in the area of operation (policy on consumption of alcohol, narcotics and drugs, sleep aids and anti-depressants, medication and vaccination, fatigue, flight and duty period limitations, stress and rest, etc.).

'5.1 General procedures valid for all operations':

(a) Consideration of the following to minimise human errors:

(1) a clear distribution and assignment of tasks; and

(2) an internal checklist to check that staff are properly performing their assigned tasks.

(b) Consideration of the deterioration of external systems supporting the UAS operation; in order to assist in the identification of procedures related to the deterioration of external systems supporting the UAS operation, it is recommended to:

(1) identify the external systems supporting the operation;

(2) describe the deterioration modes of these external systems which would prevent the operator maintaining a safe operation of the UAS (e.g. complete loss of GNSS, drift of the GNSS, latency issues, etc.);

(3) describe the means put in place to detect the deterioration modes of the external systems; and

(4) describe the procedure(s) in place once a deterioration mode of one of the external systems is detected (e.g. activation of the emergency recovery capability, switch to manual control, etc.).

(c) Coordination between the remote pilot(s) and other personnel;

(d) Methods to exercise operational control; and

(e) Pre-flight preparation and checklists. These include, but are not limited to, the following points:

(1) The site of the operation:

(i) the assessment of the area of operation and the surrounding area, including, for example, the terrain and potential obstacles and obstructions for keeping a VLOS of the UA, potential overflight of uninvolved persons, potential overflight of critical infrastructure (a risk assessment of the critical infrastructure should be performed in cooperation with the responsible organisationfor the infrastructure, as they are most knowledgeable of the threats);

(ii) the assessment of the surrounding environment and airspace, including, for example, the proximity of restricted zones and potential activities by other airspace users;

(iii) when UA VOs are used, the assessment of the compliance between visibility and planned range, the potential terrain obstruction, and the potential gaps between the zones covered by each of the UA VOs; and

(iv) the class of airspace and other aircraft operations (local aerodromes or operating sites, restrictions, permissions).

(2) Environmental and weather conditions:

(1) environmental and weather conditions adequate to conduct the UAS operation; and

(2) methods of obtaining weather forecasts.

(3) Coordination with third parties, if applicable (e.g. requests for additional permits from various agencies and the military when operating, for example, in environmentally protected areas, areas restricted to photographic flights, near critical infrastructure, in urban areas, emergency situations, etc.);

(4) the minimum number of crew members required to perform the operation, and their responsibilities;

(5) the required communication procedures between the personnel in charge of duties essential to the UAS operation, and with external parties when needed;

(6) compliance with any specific requirement from the relevant authorities in the intended area of operations, including those related to security, privacy, data and environmental protection, use of the RF spectrum; also considering cross-border operations (specific local requirements) when applicable;

(7) the required risk mitigations put in place to ensure the operation is safely conducted (e.g. a controlled ground area, securing the controlled ground area to avoid third parties entering the area during the operation, and ensuring coordination with the local authorities when needed, etc.); and

(8) procedures to verify that the UAS is in a condition to safely conduct the intended operation (e.g. update of geographical zones data for geo-awareness or geofencing systems; definition and upload of lost link contingency automatic procedures; battery status, loading and securing the payload;).

(f) Launch and recovery procedures;

(g) In-flight procedures (operating instructions for the UA (reference to or duplication of information from the manufacturer's manual); instructions

on how to keep the UA within the flight geography, how to determine the best flight route; obstacles in the area, height; congested environments, keeping the UA in the planned volume);

(h) Post-flight procedures, including the inspections to verify the condition of the UAS;

(i) Procedures for the detection of potentially conflicting aircraft by the remote pilot and, when required by the UAS operator, UA VOs; and

(j) Dangerous goods (limitations on their nature, quantity and packaging; acceptance prior to loading, inspecting packages for any evidence of leakage or damage).

'5.2 Procedures peculiar to a single operation'

(a) Procedures to cope with the UA leaving the desired 'flight geography';

(b) Procedures to cope with the UA entering the 'containment' volume;

(c) Procedures to cope with uninvolved persons entering the controlled ground area, if applicable;

(d) Procedures to cope with adverse operating conditions (e.g. in case icing is encountered during the operation, if the operation is not approved for icing conditions);

(e) Procedures to cope with the deterioration of external systems supporting the operation. In order to help properly identify the procedures related to the deterioration of external systems supporting the UAS operation, it is recommended to:

(1) identify the external systems supporting the operation;

(2) describe the deterioration modes of these external systems which would prevent the operator maintaining a safe operation of the UAS (e.g. complete loss of GNSS, drift of the GNSS, latency issues, etc.);

(3) describe the means put in place to detect the deterioration modes of the external systems; and

(4) describe the procedure(s) in place once a deterioration mode of one of the external systems is detected (e.g. activation of the emergency recovery capability, switch to manual control, etc.).

(f) De-confliction scheme (i.e. the criteria that will be applied for the decision to avoid incoming traffic). In cases where the detection is performed by UA VOs, the phraseology to be used.

'6 Emergency procedures'

(a) Procedures to avoid or, at least minimise, harm to third parties in the air or on the ground. With regard to the air risk, an avoidance strategy to minimise the collision risk with another airspace user (in particular, an aircraft with people on board); and

(b) Procedures for the emergency recovery of the UA (e.g. landing immediately, termination of the flight with FTS or a controlled crash/splash, etc.).

'7. Emergency response plan (ERP)'

See AMC3 MCAR-UAS.SPEC.030(3)(e).

UAS.SPEC.030 Operational declaration

(1) Before starting an UAS operation in the 'specific' category the UAS operator shall obtain an operational authorisation from the Authority, except:

(a) when point UAS.SPEC.020 is applicable; or

(b) the UAS operator holds an LUC with the appropriate privileges, in accordance with Part C of this MCAR.

(2) The UAS operator shall submit an application for an updated operational authorisation if there are any significant changes to the operation or to the mitigation measures listed in the operational authorisation.

(3) The application for an operational authorisation shall be based on the risk assessment referred to in Subpart D of this MCAR and shall include in addition the following information:

(a) the registration number of the UAS operator;

(b) the name of the accountable manager or the name of the UAS operator in the case of a natural person;

(c) the operational risk assessment;

(d) the list of mitigation measures proposed by the UAS operator, with sufficient information for the Authority to assess the adequacy of the mitigation means to address the risks;

(e) an operations manual when required by the risk and complexity of the operation;

(f) a confirmation that an appropriate insurance cover will be in place at the start of the UAS operations, as required by Civil Aviation (Unmanned Aircraft System) Regulation 2024.

AMC1 UAS.SPEC.030(2) Application for an operational authorisation

APPLICATION FORM FOR AN OPERATIONAL AUTHORISATION

The UAS operator should submit an application for an operational authorisation according to the following form. The application and all the documentation referred to or attached to the application should be stored for at least 2 years after the expiry of the related operational authorisation or submission of application in case of refusal. The UAS operator should ensure the protection of the stored data from unauthorised access, damage, alteration, and theft. The declaration may be complemented by the description of the procedures to ensure that all operations are in compliance with Data Protection Act on the protection of natural persons with regard to the processing of

personal data and on the free movement of such data, as required by point UAS.SPEC.050 (1)(a)(iv) of this MCAR.

UAS.SPEC.040 Issuing of an operational authorisation

(1) When receiving an application in accordance with point UAS.SPEC.030, the Authority shall issue, without undue delay, an operational authorisation in accordance with Regulation 11 of the Civil Aviation (unmanned Aircraft System) Regulations 2024 when it concludes that the operation meets the following conditions:

(a) all information in accordance with point (3) of point UAS.SPEC.030 is provided;

(b) a procedure is in place for coordination with the relevant service provider for the airspace if the entire operation, or part of it, is to be conducted in controlled airspace.

(2) The Authority shall specify in the operational authorisation the exact scope of the authorisation in accordance with Regulation 11 of the Civil Aviation (unmanned Aircraft System) Regulations 2024.

AMC1 UAS.SPEC.040(1) Operational authorisation

OPERATIONAL AUTHORISATION TEMPLATE

The Authority should produce the operational authorisation according to the following form:

	Operational authorisation for the 'specific' category	
NAA Logo		
Email		

	3.8.2 ERP	☐ No ☐ Yes, low ☐ Yes, medium ☐ Yes, high

3.10 Residual air risk level		☐ ARC-a ☐ ARC-b ☐ ARC-c ☐ ARC-d
3.11 Air risk mitigations	**mitigations**	If yes, please describe _____
essential for the safety of the operation		
Civil Aviation Regulations 2007		
		☐ No ☐ Yes

4.3 Type of UAS	☐ Aeroplane ☐ Helicopter ☐ Multirotor		_____ m
4.7 Additional technical requirements			
mark			
verification report, if required			

if required	
4.11 Number of the noise certificate, if required	
4.12 Mitigation to reduce effect of ground impact	☐ No ☐ Yes, low ☐ Yes, medium ☐ Yes, high Required to reduce the ground risk ☐ Yes ☐ No
4.13 Technical requirements for containment	☐ Basic ☐ Enhanced
5. Remarks	

(UAS operator name) is authorised to conduct UAS operations with the	
6.1 Operational authorisation number	
6.2 Expiry date	DD/MM/YYYY

Instructions for filling in the operational authorisation form

1.1 Name of the Authority that issues the operational authorisation, including the name of the State.

1.2 Contact details of the Authority staff responsible for the file.

2.1 UAS operator registration number in accordance with Regulation 5 and 7 of the Civil Aviation(Unmanned Aircraft System) Regulations 2024.

2.2 UAS operator's name, as registered in the UAS operator registration database.

2.3 Contact details of the person responsible for the UAS operation, in charge to answer possible operational questions raised by the Authority.

3.1 Location(s) where the UAS operator is authorised to operate. The identification of the location(s) should contain the full operational volume and ground risk buffer (the red line in Figure 3). Depending on the initial ground and air risk and on the application of mitigation measures, the location(s) may be 'generic' or 'precise' (refer to GM2 UAS.SPEC.030(2)). When the UAS operation is conducted in Mauritius, the Authority should specify the location(s) of operation, according to the Civil Aviation (unmanned Aircraft System) Regulations 2024..

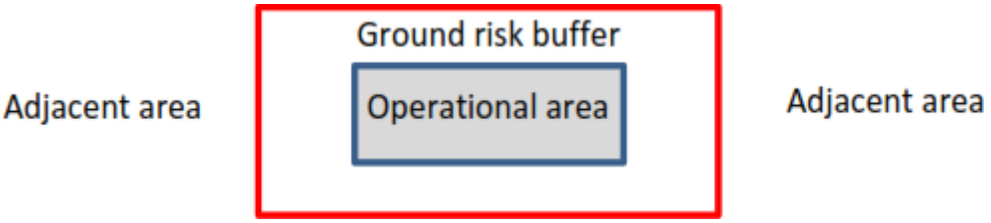


Figure 3 - Operational area and ground risk buffer

3.2 Provide the maximum distance in km to be considered for the adjacent area, starting from the limits of the ground risk buffer.

3.3 Select one of the three options. If the SORA is used, indicate the version. In case a PDRA is used, indicate the number and its revision. In case a risk assessment methodology is used other than the SORA, provide its reference. In this last case, the UAS operator should demonstrate that the methodology complies with Subpart D of this MCAR.

3.4 If the risk methodology used is the SORA, indicate the final SAIL of the operation, otherwise the equivalent information provided by the risk assessment methodology used.

3.5 Select one of the two options.

3.6 Select one of the two options.

3.7 Characterise the ground risk (i.e. density of overflown population density, expressed in persons per km^2, if available, or 'controlled ground area', 'sparsely

populated area', 'populated area', 'gatherings of people') for both the operational and the adjacent area.

3.8.1 Select one of the four options. In case the risk assessment is based on the SORA, this consists in M1 mitigation.

3.8.2 Select one of the four options. In case the risk assessment is based on the SORA, this consists in M3 mitigation.

3.9. Insert the maximum flight altitude, expressed in metres and feet in parentheses, of the approved operational volume (adding the air risk buffer, if applicable) using the AGL reference when the upper limit is below 150 m (492 ft), or use the MSL reference when the upper limit is above 150 m (492 ft).

3.10 Select one of the four options.

3.11.1 Select one of the two options.

3.11.2 Describe the tactical mitigation methods to be applied by the UAS operator.

3.12 Select one of the two options.

3.13 Specify the type of the remote pilot certificate, if required; otherwise, indicate 'Declared'.

3.14 Specify the type of the certificate for the staff, other than the remote pilot, essential for the safety of the operation, if required; otherwise, indicate 'Declared'.

3.15 List the type of events that the UAS operator should report to the Authority, in addition to those required by the Civil Aviation Regulations 2007, if applicable.

3.16 Select one of the two options.

3.17 Indicate the OM's identification and revision number.

3.18 Indicate the compliance evidence file identification and revision number.

3.19 Additional limitations defined by the Authority.

4. Only the UAS features/characteristics required to be used for the operation should be identified in the form (e.g. in case the UAS qualifies for enhanced containment but the operation requires a basic containment, and the operator developed consistent procedures, then the basic containment should be ticked).

4.1 Name of the manufacturer of the UAS.

4.2 Model of the UAS as defined by the manufacturer.

4.3 Select one of the five options.

4.4 Indicate the maximum dimensions of the UA in metres (e.g. for aeroplanes: the length of the wingspan; for helicopters: the diameter of the propellers; for multirotors: the maximum distance between the tips of two opposite propellers) as used in the risk assessment to identify the ground risk.

4.5 Indicate the maximum value, expressed in kg, of the UA take-off mass (TOM), at which the UAS operation may be operated. All flights should then be operated not exceeding that TOM. The TOM maybe be different from (however, not higher than) the MTOM defined by the UAS manufacturer.

4.6 Maximum cruise airspeed, expressed in m/s and kt in parentheses, as defined in the manufacturer’s instructions.

4.7 List any additional technical requirements established by the Authority.

4.8 Unique serial number (SN) of the UA defined by the manufacturer according to standard ANSI/CTA-2063-A-2019, Small Unmanned Aerial Systems Serial Numbers, 2019, or the UA registration mark if the UA is registered. In case of privately built UAS or UAS not equipped with a unique SN, insert the unique SN of the remote identification system.

4.9 Include Type Certificate (TC) number, or the UAS design verification report number issued by the manufacturer, as required by the Authority.

4.10 If a UAS with a a Type Certificate (TC) is required, the UAS should have a certificate of airworthiness (CofA), and the Authority should require compliance with the continuing airworthiness rules.

4.11 If a UAS with an Type Certificate (TC) is required, the UAS should have a noise certificate.

4.12 Select one of the four options of the first row. In case the risk assessment is based on the SORA, this consists in M2 mitigation. Even if the UAS may be equipped with such system, this mitigation may not be required in the operation to reduce the ground risk. In this case, in the second row select 'NO'. If the mitigation is instead used to reduce the ground risk, select 'YES' and the operator is required to include in the OM the related procedures.

4.13 Select one of the two options.

5 Free-text field for the addition of any relevant remark.

6.1 Reference number of the operational authorisation, as issued by the Authority. The number should have the following format:

NNN-OAT-xxxxx/yyy

Where:

— 'NNN' is the ISO 3166 Alpha-3 code of the Member State that issues the operational authorisation;

— 'OAT' is a fixed field meaning 'operational authorisation';

— 'xxxxx' are up to 12 alphanumeric characters defining the operational authorisation number; and

— ‘yyy’ are 3 alphanumeric characters defining the revision number of the operational authorisation; each amendment of the operational authorisation will determine a new revision number.

6.2 The duration of the operational authorisation may be unlimited; in this case, indicate ‘Unlimited’. The authorisation will be valid for as long as the UAS operator complies with the relevant requirements of the UAS Regulation and with the conditions defined in the operational authorisation.

Note 1: In section 4, more than one UAS may be listed. If needed, the fields may be duplicated.

Note 2: The signature and stamp may be provided in electronic form. The quick response (QR) code should provide the link to the national database where the operational authorisation is stored.

GM1 UAS.SPEC.040(1) Operational authorisation

OPERATIONAL AUTHORISATION TEMPLATE

In order to facilitate mutual recognition in cases of cross-border operations, the Authority should produce an English version of the operational authorisation.

UAS.SPEC.050 Responsibilities of the UAS operator

(1) The UAS operator shall comply with all of the following:

(a) establish procedures and limitations adapted to the type of the intended operation and the risk involved, including:

(i) operational procedures to ensure the safety of the operations;

(ii) procedures to ensure that security requirements applicable to the area of operations are complied with in the intended operation;

(iii) measures to protect against unlawful interference and unauthorised access;

(iv) procedures to ensure that all operations are in respect of the Data protection Act on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

(v) guidelines for its remote pilots to plan UAS operations in a manner that minimizes nuisances, including noise and other emissions-related nuisances, to people and animals.

(b) designate a remote pilot for each flight or, in the case of autonomous operations, ensure that during all phases of the flight, responsibilities and tasks especially those defined in points (2) and (3) of point UAS.SPEC.060 are properly allocated in accordance with the procedures established pursuant to point (a);

(c) ensure that all operations effectively use and support the efficient use of radio spectrum in order to avoid harmful interference;

(d) ensure that before conducting operations, remote pilots comply with all of the following conditions:

(i) have the competency to perform their tasks in line with the applicable training identified by the operational authorisation or, if point UAS.SPEC.020 applies, by the conditions and limitations defined in the appropriate standard scenario listed in Appendix 1 or as defined by the LUC;

(ii) follow remote pilot training which shall be competency based and include the competencies set out in paragraph 2 of Article 8:

(iii) follow remote pilot training, as defined in the operational authorisation, for operations requiring such authorisation, it shall be conducted in cooperation with an entity designated by the Authority;

(iv) follow remote pilot training for operations under declaration that shall be conducted in accordance with the mitigation measures defined by the standard scenario;

(v) have been informed about the UAS operator's operations manual, if required by the risk assessment and procedures established in accordance with point (a);

(vi) obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Regulation 18 of the Civil Aviation (unmanned Aircraft System) Regulations 2024;

(e) ensure that personnel in charge of duties essential to the UAS operation, other than the remote pilot itself, comply with all of the following conditions:

(i) have completed the on-the-job-training developed by the operator;

(ii) have been informed about the UAS operator's operations manual, if required by the risk assessment, and about the procedures established in accordance with point (a);

(ii) have obtained updated information relevant to the intended operation about any geographical zones defined in accordance with Regulation 18 of the Civil Aviation (unmanned Aircraft System) Regulations 2024;

(f) carry out each operation within the limitations, conditions, and mitigation measures defined in the declaration or specified in the operational authorisation;

(g) keep and maintain an up-to-date record of:

(i) all the relevant qualifications and training courses completed by the remote pilot and the other personnel in charge of duties essential to the UAS operation and by the maintenance staff, for at least 3 years after those persons have ceased employment with the organisation or have changed their position in the organisation;

(ii) the maintenance activities conducted on the UAS for a minimum of 3 years;

(iii) the information on UAS operations, including any unusual technical or operational occurrences and other data as required by the declaration or by the operational authorisation for a minimum of 3 years;

(h) use UAS which, as a minimum, are designed in such a manner that a possible failure will not lead the UAS to fly outside the operation volume or to cause a fatality. In addition, Man Machine interfaces shall be such to minimise the risk of pilot error and shall not cause unreasonable fatigue;

(i) maintain the UAS in a suitable condition for safe operation by:

(i) as a minimum, defining maintenance instructions and employing an adequately trained and qualified maintenance staff; and

(ii) complying with point UAS.SPEC.100, if required;

(iii) using an unmanned aircraft which is designed to minimise noise and other emissions, taking into account the type of the intended operations and geographical areas where the aircraft noise and other emissions are of concern.

(j) establish and keep an up-to-date list of the designated remote pilots for each flight;

(k) establish and keep an up-to-date list of the maintenance staff employed by the operator to carry out maintenance activities; and

(l) ensure that each individual unmanned aircraft is installed with:

(i) at least one green flashing light for the purpose of visibility of the unmanned aircraft at night, and

(ii) an active and up-to-date remote identification system.

AMC1 UAS.SPEC.050(1) Responsibilities of the UAS operator

OPERATIONAL PROCEDURES

(a) The UAS operator should develop procedures as required by the standard scenario (STS) or by the operational authorisation.

(b) If a UAS operator employs more than one remote pilot, the UAS operator should:

(1) develop procedures for UAS operations in order to coordinate the activities between its employees; and

(2) compile and maintain a list of their personnel and their assigned duties.

(c) The UAS operator should allocate functions and responsibilities in accordance with the level of autonomy of the UAS during the operation.

AMC1 UAS.SPEC.050(1)(a) Responsibilities of the UAS operator

OPERATIONAL PROCEDURES

The UAS operator should develop operational procedures based on the manufacturer's recommendations, if available.

When the UAS operator is required to develop an OM in accordance with point UAS.SPEC.030(3)(e), the procedures should be included in that manual.

GM1 UAS.SPEC.050(1)(a)(iv) Responsibilities of the UAS operator

PROCEDURES TO ENSURE THAT ALL OPERATIONS ARE IN COMPLIANCE WITH THE DATA PROTECTION ACT ON THE PROTECTION OF NATURAL PERSONS WITH REGARD TO THE PROCESSING OF PERSONAL DATA AND ON THE FREE MOVEMENT OF SUCH DATA

The UAS operator is responsible for complying with any applicable National Regulations, in particular, with regard to privacy, data protection, liability, insurance, security and environmental protection.

This GM has the purpose of providing guidance to the UAS operator to help them to identify and describe the procedures to ensure that the UAS operations are in compliance with the Data Protection Act on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

Description of the procedures established by the UAS operator to ensure that the UAS operation is in compliance with the Data Protection Act

1. Identify the privacy risks[1] that the intended operation may create
2. Define your role with respect to personal data collection and processing
☐ I am the (joint) data controller ☐ I am the (joint) data processor
3. Data protection impact assessment (DPIA)
Have you assessed the need to perform a DPIA: Yes ☐ No ☐ **If yes, do you have to perform a DPIA? Yes ☐ No ☐ - If yes, did you perform a DPIA? Yes ☐ No ☐**
4. Describe the measures you are taking to ensure data subjects are aware that their data may be collected[6]

5. Describe the measures you are taking to minimise the personal data you are collecting or to avoid collecting personal data[7]
6. Describe the procedure established to store the personal data and limit access to it
7. Describe the measures taken to ensure that data subjects can exercise their right to access, correction, objection and erasure
8. Additional information

Notes:

1. For guidance regarding the identification of the **privacy risks** of your operation, please check:

   — The DR PRO online training course *(the link is temporary unavailable)*: Module 1 — Privacy risks in context; and

   — The DR PRO Privacy-by-Design Guide: Privacy risks and safeguards in drone manufacturing (page 10).

2. For more information about **definitions of personal data**, please check:

   — The DR PRO online training course *(the link is temporary unavailable)*: Module 2 – What is personal data? and

   — The DR PRO Privacy Code of Conduct: 3. Glossary.

   'Data controller' means that you make decisions about what personal data is collected and how it is collected, processed and stored.

   'Data processor' means that you follow instructions from another entity on collecting, processing and storing personal data.

   For more information about your potential role as **data controller or data processor**, you can check:

   — The DR PRO online training course *(the link is temporary unavailable)*: Module 2 – Data protection Roles; and

   — The DR PRO Privacy Code of Conduct for the responsibilities of data controllers.

3. For more information about when and how to conduct **data protection impact assessments** please check:

   — The DR PRO Data Protection Impact Assessment template

4. For more information about how to **inform data subjects** about your activities you can check:

   — The DR PRO Privacy Code of Conduct: 4.3.2 Act visibly and transparently; course *(the link is temporary unavailable)*: Module 3 – Carry out your operation; and

   — The DR PRO Pre-flight checklist *(the link is temporary unavailable)*

5. For more information about the **data minimisation principle**, please check:

   — The DR PRO Privacy Code of Conduct: 4.3.1 Minimise the impact on people's privacy and data protection; — The DR PRO Privacy-by-Design Guide: Drone Privacy Enhancing Software Features; and

   — The DR PRO online training course *(the link is temporary unavailable)*: Module 3 – Risk mitigation strategies.

6. For guidance on the **secure storage and access** to personal data, please check:

   — The DR PRO Privacy Code of Conduct: 4.4.2 Handle data securely;

   — The DR PRO online training course *(the link is temporary unavailable)*: Module 2 – How should personal data be handled? and

   — The DR PRO Privacy-by-Design Guide: Drone Privacy Enhancing Software Features.

7. For more information about the **rights of data subjects**, please check:

   — The DR PRO Privacy Code of Conduct: 4.3.3 Respect the rights of individuals; and

   — The DR PRO online training course *(the link is temporary unavailable)*: Module 2 – How should individuals be treated?

GM1 UAS.SPEC.040(1) Operational authorisation

PROCEDURES TO ENSURE THAT ALL OPERATIONS ARE IN COMPLIANCE WITH REGULATION (EU) 2016/679 ON THE PROTECTION OF NATURAL PERSONS WITH REGARD TO THE PROCESSING OF PERSONAL DATA AND ON THE FREE MOVEMENT OF SUCH DATA

The UAS operator is responsible for complying with any applicable European Union and national rules, in particular, with regard to privacy, data protection, liability, insurance, security and environmental protection.

This GM has the purpose of providing guidance to the UAS operator to help them to identify and describe the procedures to ensure that the UAS operations are in compliance with Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

Description of the procedures established by the UAS operator to ensure that the UAS operation is in compliance with Regulation (EU) 2016/679

Have you assessed the need to perform a DPIA: ☐ Yes ☐ No

Notes:

1. For guidance regarding the identification of the privacy risks of your operation, please check:

— The DR PRO online training course (the link is temporary unavailable): Module 1 — Privacy risks in context; and

— The DR PRO Privacy-by-Design Guide: Privacy risks and safeguards in drone manufacturing (page 10).

2. For more information about definitions of personal data, please check:

— The DR PRO online training course (the link is temporary unavailable): Module 2 – What is personal data? and

— The DR PRO Privacy Code of Conduct: 3. Glossary.

'Data controller' means that you make decisions about what personal data is collected and how it is collected, processed and stored.

'Data processor' means that you follow instructions from another entity on collecting, processing and storing personal data.

For more information about your potential role as data controller or data processor, you can check:

— The DR PRO online training course (the link is temporary unavailable): Module 2 – Data protection Roles; and

— The DR PRO Privacy Code of Conduct for the responsibilities of data controllers.

3. For more information about when and how to conduct data protection impact assessments please check:

— The DR PRO Data Protection Impact Assessment template

4. For more information about how to inform data subjects about your activities you can check:

— The DR PRO Privacy Code of Conduct: 4.3.2 Act visibly and transparently;

— The DR PRO online training course (the link is temporary unavailable): Module 3 – Carry out your operation; and

— The DR PRO Pre-flight checklist (the link is temporary unavailable)

5. For more information about the data minimisation principle, please check:

— The DR PRO Privacy Code of Conduct: 4.3.1 Minimise the impact on people's privacy and data protection;

— The DR PRO Privacy-by-Design Guide: Drone Privacy Enhancing Software Features; and

— The DR PRO online training course (the link is temporary unavailable): Module 3 – Risk mitigation strategies.

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— The DR PRO online training course (the link is temporary unavailable): Module 2 – How should personal data be handled? and

— The DR PRO Privacy-by-Design Guide: Drone Privacy Enhancing Software Features.

7. For more information about the rights of data subjects, please check:

— The DR PRO Privacy Code of Conduct: 4.3.3 Respect the rights of individuals; and

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GM1 UAS.SPEC.050(1)(b) Responsibilities of the UAS operator

LEVEL OF AUTONOMY AND GUIDELINES FOR HUMAN-AUTONOMY INTERACTION

The concept of autonomy, its levels and human-autonomous system interactions are currently being discussed in various domains (not only in aviation), and no common

understanding has yet been reached. Guidance will therefore be provided once this concept is mature and globally accepted.

Nevertheless, the risk assessment of autonomous operations should ensure, as for any other operations, that the risk is mitigated to an acceptable level.

Besides, it is expected that autonomous operations or operations with a high level of autonomy will be subject to authorisation and will not be covered by STSs until enough experience is gained.

AMC1 UAS.SPEC.050(1)(d) and UAS.SPEC.050(1)(e) Responsibilities of the UAS operator

THEORETICAL KNOWLEDGE SUBJECTS FOR THE TRAINING OF THE REMOTE PILOT AND ALL PERSONNEL IN CHARGE OF DUTIES ESSENTIAL TO THE UAS OPERATION IN THE 'SPECIFIC' CATEGORY

(a) The 'specific' category may cover a wide range of UAS operations with different levels of risk and a wide range of UAS designs, in particular in terms of level of automation. The following guidelines may, therefore, have to be adapted considering the level of automation and the level of involvement of the remote pilot in the management of the flight. The UAS operator is, therefore, required to identify the competency required for the remote pilot according to the outcome of the risk assessment. This AMC covers the theoretical knowledge subjects while AMC2 UAS.SPEC.050(1)(d) covers the practical knowledge subjects applicable to all UAS operations in the 'specific' category. In addition, for both theoretical and practical knowledge subjects, the UAS operator should select the relevant additional modules from AMC3 UAS.SPEC.050(1)(d), as applicable to the type of the intended UAS operation. The UAS operator should achieve a level of robustness consistent with the assurance integrity level (e.g. SAIL) of the intended UAS operation.

(b) Additional topics to cover areas under national competence, such as national regulations for security, privacy and data protection, may be added by the national Authority. In case of operations conducted in the republic of Mauritius other than the State of registration, these additional topics may be defined as local conditions required by the State of operation.

(c) When the UAS operation is conducted according to one of the STSs that are listed in Appendix 1 to the Annex of the UAS Regulation, the UAS operator should ensure that the remote pilot has the competency that is defined in the STSs. In all other cases, the UAS operator should propose to the Authority, as part of the application, a theoretical

knowledge training course for the remote pilot based on the elements that are listed in AMC1 UAS.OPEN.020(4)(b), in UAS.OPEN.040(3), in AMC1 UAS.OPEN.030(2)(c) and in Attachment A to the Annex of the UAS Regulation, which are relevant for the intended operation, complemented by the elements listed below. The UAS operator may use the same listed topics to propose also for the personnel in charge of duties essential to the UAS operation a theoretical knowledge training course with competency-based theoretical training specific to the duties of that personnel.

(1) Aviation safety:

(i) remote pilot records;

(ii) logbooks and associated documentation;

(iii) good airmanship principles;

(iv) aeronautical decision-making;

(v) ground safety;

(vi) air safety;

(vii) air proximity reporting; and

(viii) advanced airmanship:

(A) manoeuvres and emergency procedures; and

(B) general information on unusual conditions (e.g. stalls, spins, vertical lift limitations, autorotation, vortex ring states).

(2) Aviation regulations:

(i) introduction to the UAS Regulation with focus on the ‘specific’ category;

(ii) risk assessment, introduction to the SORA; and

(iii) overview of the STSs and the PDRA.

(3) Navigation:

(i) navigational aids (e.g. GNSS) and their limitations;

(ii) reading maps and aeronautical charts (e.g. 1:500 000 and 1:250 000, interpretation, specialised charts, helicopter routes, U-space service areas, and understanding of basic terms); and

(iii) vertical navigation (e.g. reference altitudes and heights, altimetry).

(4) Human performance limitations:

(i) perception (situational awareness in BVLOS operations);

(ii) fatigue:

(A) flight duration within work hours;

(B) circadian rhythm;

(C) work stress;

(D) vision problems; and

(E) commercial pressure;

(iii) attentiveness:

(A) eliminating distractions; and

(B) scan techniques;

(iv) medical fitness (health precautions, alcohol, drugs, medication, etc.); and

(v) environmental factors such as vision changes from orientation to the sun.

(5) Airspace operating principles:

(i) airspace classifications and operating principles;

(ii) U-space;

(iii) procedures for airspace reservation;

(iv) aeronautical information publications (AIPs); and

(v) NOTAMs.

(6) General knowledge of UASs and external systems that support the operation of UASs:

(i) differences between autonomy levels (e.g. automatic versus autonomous operations);

(ii) loss of signal and system failure protocols — understanding the condition and planning for programmed responses such as returning to home, loiter, landing immediately;

(iii) equipment to mitigate air and ground risks (e.g. flight termination systems);

(iv) flight control modes;

(v) the means to monitor the UA (its position, height, speed, C2 link, systems status, etc.);

(vi) the means of communication with the VOs; and

(vii) the means to support air traffic awareness.

(7) Meteorology:

(i) obtaining and interpreting advanced weather information:

(A) weather reporting resources;

(B) reports;

(C) forecasts and meteorological conventions appropriate for typical UAS flight operations;

(D) local weather assessments (including sea breeze, sea breeze front, and urban heat island);

(E) low-level charts; and

(F) METAR, SPECI, TAF;

(ii) regional weather effects — standard weather patterns in coastal, mountain or desert terrains; and

(iii) weather effects on the UA (wind, storms, mist, variation of wind with altitude, wind shear, etc.).

(8) Technical and operational mitigation measures for air risks:

(i) operations for which airspace observers (AOs) are employed; and

(ii) principles of detect and avoid (DAA).

(9) Operational procedures:

(i) mission planning, airspace considerations, and site risk assessment:

(A) measures to comply with the limitations and conditions applicable to the operational volume and to the ground risk buffer for the intended UAS operation;

(B) UAS operations over a controlled ground area;

(C) BVLOS operations;

(D) use of UA VOs;

(E) importance of on-site inspections, operation planning, pre-flight and operating procedures;

(ii) multi-crew cooperation (MCC):

(A) coordination between the remote pilot and other personnel (e.g. AOs) in charge of duties essential to the UAS operation;

(B) crew resource management (CRM):

(C) effective leadership;

(D) working with others.

(10) Managing data sources regarding:

(i) where to obtain the data from;

(ii) the security of the data;

(iii) the quantity of the data needed; and

(iv) the impact on the storage of data

(d) emergency response plan (ERP) — the UAS operator should provide its personnel with competency-based theoretical training covering the ERP that includes the related proficiency requirements and recurrent training.

(e) Both the training and the assessment should be appropriate to the level of automation of the intended UAS operation.

AMC2 UAS.SPEC.050(1)(d) and UAS.SPEC.050(1)(e) Responsibilities

PRACTICAL-SKILLS TRAINING FOR THE REMOTE PILOT AND ALL PERSONNEL IN CHARGE OF DUTIES ESSENTIAL TO THE UAS OPERATION IN THE 'SPECIFIC' CATEGORY

(a) Regarding the practical-skills training and assessment for the remote pilot, the UAS operator should consider the competencies that are defined in AMC2 UAS.OPEN.030(2)(b), complemented by the items listed below. The UAS operator should adapt the practical-skills training to the characteristics of the intended UAS operation and the functions available on the UAS. The UAS operator may use the same listed topics and may provide a practical training course also for all other personnel in charge of duties essential to the UAS operation.

Appropriate simulators may be used to conduct some or all the tasks.

(1) Preparation of the UAS operation:

(i) implement the necessary measures to comply with the limitations and conditions applicable to the operational volume and to the ground risk buffer for the intended UAS operation in accordance with the OM procedures;

(ii) follow the necessary procedures for UAS operations in controlled airspace, including a protocol to communicate with the ATC and obtain clearance and instructions, if necessary;

(iii) confirm that all necessary documents for the intended UAS operation are on-site;

(iv) brief all participants on the planned UAS operation;

(v) perform visual airspace scanning; and

(vi) if AOs are employed, place them appropriately and brief them on the deconfliction scheme that includes phraseology.

(2) Preparation for the flight:

(i) ensure that all safety systems and functions, if installed on the UAS, including its height and speed limitation systems, flight termination system, and triggering system, are operational; and

(ii) know the basic actions to be taken in the event of an emergency, including issues with the UAS, or a mid-air collision hazard arising during the flight.

(3) Flight under abnormal conditions:

(i) manage a partial or a complete power shortage of the UA propulsion system, while ensuring the safety of third parties on the ground;

(ii) manage a situation of a non-involved person entering the operational volume or the controlled ground area, and take appropriate measures to maintain safety; and

(iii) react to, and take the appropriate corrective actions for, a situation where the UA is likely to exceed the limits of both the flight geography (contingency procedures) and of the operational volume (emergency procedures) as they were defined during the flight preparation.

(4) In general, emphasis should be placed on the following:

(i) normal, contingency, and emergency procedures;

(ii) skill tests combined with periodic proficiency checks;

(iii) operational experience (with on-the-job training counting towards proficiency);

(iv) pre-flight and post-flight procedures and documentation;

(v) recurrent training (UAS / flight training device (FTD)); and

(vi) remote pilot incapacitation.

(b) The practical-skills training may be conducted with the UAS or on an FTD. Scenario-based training (SBT) with highly structured, real-world experience scripts for the intended UAS operation should be used to fortify personnel's learning in an operational environment and improve situational awareness. SBT should include realistic normal, abnormal, and emergency scenarios that are drafted considering specific learning objectives.

(c) The practical-skills training is checked during the assessment and can be provided using the actual UAS or an FTD appropriate to the intended UAS operation.

(d) Initial and recurrent training

(1) The UAS operator should ensure that specified minimum requirements regarding the time of the initial and recurrent training (e.g. duration and number of flight hours) are provided for in a manner that is acceptable and approved by the Authority.

(2) Depending on the training course, each of the topics shown in Table 1 below may require only overview training or in-depth training. In-depth training should be interactive and should include discussions, case-study reviews, and role play, as deemed necessary to enhance learning. In case of change or update of the SW/HW of the UAS, depending on the size of the changes, the UAS operator should define the level of training.

Table 1 - Level of the practical-skills training in several topics depending on initial training,

Situational	In-depth	In-depth	Overview	Overview
Organisational safety culture, operational	In-depth	Not required	In-depth	Overview
Automation and	As required	In-depth	In-depth	As required

AMC3 UAS.SPEC.050(1)(d) Responsibilities of the UAS operator

UAS OPERATION-SPECIFIC ENDORSEMENT MODULES

Depending on the type and risk of the intended UAS operation, the UAS operator may propose, as part of the application for an operational authorisation, additional theoretical knowledge training in combination with the practical-skills training that is specific to the intended UAS operation as described in the OM.

The practical-skills training should at least contain the practical competencies that are described in AMC2 UAS.OPEN.030(2)(b) 'UAS operations in subcategory A2', which may include relevant emergency and contingency procedures. However, the UAS operator may adapt that training to the level of automation of the UAS.

During the practical-skills training, the remote pilot should list the relevant emergency and contingency procedures, which are defined in the OM and are peculiar to flight over known populated areas or over assemblies of people or increased air risk, in a given area of operation, and should describe the basic conditions for each kind of emergency as well as the related recovery techniques to be applied during flight for the emergencies that are defined in the OM. Depending on the criticality of the situation and on the available time to react, the remote pilot should memorise some procedures, while for other procedures, they may consult a checklist. The emergency and

contingency procedures may involve also other personnel; in that case, the UAS operator should define the practical-skills training needed for them.

The remote pilot only needs to complete the relevant operation-specific endorsement modules that reflect the intended UAS operation. For example, in case of transport of cargo, the remote pilot should complete the related training module 'Transport and/or dropping of cargo'; however, if the cargo contains dangerous goods, then the remote pilot should also complete the training module 'Transport of dangerous goods'.

The assurance level of the operation-specific endorsement modules is determined by the related assurance integrity level (e.g. SAIL) according to the respective specific operational risk assessment.

Relevant UAS operation-specific endorsement modules should be reflected in the documentation of the remote pilot's competencies.

The following UAS operation-specific endorsement modules and the areas to be covered are recommended:

(a) night operations;

(b) overflight (flight over known populated areas or over assemblies of people);

(c) BVLOS operations;

(d) low-altitude (below 500 ft) operations;

(e) flights in non-segregated airspace;

(f) transport and/or dropping of cargo;

(g) transport of dangerous goods;

(h) operations with multiple UASs and swarms;

(i) UA launch and recovery using special equipment;

(j) flying over mountainous terrain.

Note: The 'Rationale' in grey-font italics under the 'Learning objectives' column is provided for explanatory purposes and does not form part of the proposed rule text.

Night operations	General	Recognise the meaning of the definition of 'night' or other similar wording that is used for night flight. *Rationale: In Regulation (EU) No 1178/2011 (the 'Aircrew Regulation'), 'night' for manned aviation 'means the period between the end of evening civil twilight and the beginning of morning civil twilight or such other period between sunset and sunrise as may be prescribed by the appropriate authority'.* *Some national laws use the sunset and sunrise times for the definition of a night flight. 'Sunset' is defined as the*

		Recognise that an infrared radiation (IR) camera allows one to see enough at night. Turning off the front green flashing light might improve the view because there will be no reflection in the on-board camera. Recognise that the IR camera does not help in case of rain/humidity, and that the IR visibility significantly decreases. Explain the use of the green flashing light at night. Explain the use of navigation lights, position lights, anti-collision lights, and other lights for UA controllability. Explain the use of lights (e.g. navigation, position, or anti-collision lights) for recognising the presence of manned aircraft.

		Rationale: Those lights show where the UA is positioned and the direction in which the UA is aligned. *For manned aircraft, a red navigation light is located on the leading edge of the left-wing tip and a green navigation light on the leading edge of the rightwing tip (for helicopters, on the left and right sides of the cockpit). A white navigation light is positioned on the tail as far aft as possible. High- intensity strobe lights are also located in those positions. They are used as anti-collision lights and flash twice after a short break. A red rotating beacon is also part of the anti-collision lights.*
	Degradation of visual acuity	Recognise that flying the UA at night degrades visual perception. Recognise night myopia, caused by the increasing pupil size. At low-light levels, without distant objects to focus on, the focusing mechanism of the eye may go to a resting myopic position.

		If night-vision goggles are used, know how they function.
	Night illusions	Define the term ‘night illusion’. Recognise and overcome visual illusions that are caused by darkness, and understand the physiological conditions that may degrade night vision. State the limitations of night vision techniques at night and by day.

	Altered visual-scanning techniques	State the limitations of the different visual- scanning techniques at night and by day. *Rationale: Despite the value of electronic means of conflict detection, physical lookout remains an important defence against the loss of visual separation for all types of aircraft.* *To avoid collisions, the remote pilot should visually scan effectively from the moment the UA starts moving until it comes to a stop at the end of the flight. Collision threats are present everywhere.* *Before take-off, the remote pilot should visually check the take-off area to ensure that there are no other objects. After take-off, the remote pilot should continue to visually scan to ensure a safe departure of the UA with no obstacles.*
	Altered identification of obstacles	Explain the effect of obstacles on the take-off distance that is required at night.

		Rationale: The remote pilot should know the flight area where the UA will fly at night. Objects look different and power lines are nearly invisible at night. It is, therefore, advisable that the remote pilot conduct a test flight during the daytime.
Overflight (flight over known populated areas or over assemblies of people)	Identification of populated areas and assemblies of people	Explain the definition of 'populated area' and 'assemblies of people'.
	Optimising flight paths to reduce risk of exposure	Explain the effects of the following variables on the flight path and take-off distances: — take-off procedure; obstacle clearances both laterally and vertically; understand the lethality of a UAS including debris area through flying parts after a crash; and recognise the importance of a defined emergency landing area.

	Likely operating sites and alternative sites	Recognise the different operating sites and alternative sites on the route of the overflight.
	Adequate clearance for wind effects, especially in urban environment	Explain how the wind changes at very low height due to its interaction with orography and buildings.
	Obstructions (wires, masts, buildings, etc.)	Explain the effect of obstacles on the required takeoff distance. Interpret all available procedures, data, and information regarding obstructions that could be encountered during overflight

Operation-specific endorsement modules	**Areas to be covered**	**Learning objectives**
	Avoiding third-party interference with the UA	Explain how to avoid third-party interference with the UA.

	Minimum separation distances from persons, vessels, vehicles, and structures	Explain the importance of minimum separation distances from persons, vessels, vehicles, and structures.
	Impact of electromagnetic interference, i.e. high-intensity radio transmissions	Describe the physical phenomenon 'interference'. Explain in which situations electromagnetic interference could occur, particularly with regard to electromagnetic emissions and signal reflections peculiar to an urban environment. Explain their impact on the UAS system (i.e. C2 link GNSS quality, etc.)

	Crowd control strategies and public access	Explain the importance of ensuring that no one is endangered within the take-off and landing area. Describe the different crowd control strategies. Explain the importance of having knowledge of public access.
BVLOS operations	Operation planning: airspace, terrain, obstacles, expected air traffic, and restricted areas	Explain the operation planning for BVLOS operations: — check the flying conditions (e.g. geographical zone, NOTAM) and obstacles along the planned route; — secure the necessary documentation before the BVLOS operation;

		know and comply with the local conditions in the area where the BVLOS operation takes place;

Operation-specific endorsement modules	Areas to be covered	Learning objectives

		ensure communication with the air traffic controller (ATCO), depending on the type of airspace within which the BVLOS operation is planned to be conducted; plan the BVLOS operation including flight route and response to contingency and emergency events; in uncontrolled airspace, check the actual traffic level of manned traffic along the planned route, including low-level traffic such as paragliders, hang gliders, helicopters, model aircraft, seaplanes and other possible traffic; — in uncontrolled airspace, verify that

		The UAS operation has been notified to manned aviation using, e.g. NOTAM, or other means used by manned aviation; how to employ airspace observers (AOs), when needed; — consider the C2 link limitations (e.g. maximum range and presence of obstacles); and use of conspicuity devices or traffic information / detection of incoming aircraft / deconfliction and emergency manoeuvres.

	Sensor systems and their limitations	State the limitations of the different sensor systems. *Rationale: UASs that are used for BVLOS operations should maintain precise positioning to avoid traffic conflict and to successfully carry out their mission. Environmental features, such as tunnels and urban canyons, can weaken GNSS signals or even cause them to be lost completely.*

Operation-specific endorsement modules	**Areas to be covered**	**Learning objectives**
		To maintain accuracy in GNSS-denied environments, UA may use real-time kinematic

		(RTK) capable inertial navigation systems (INSs) *that provide information from accelerometers and gyroscopes to accurately estimate position, velocity, heading, and attitude.*
	Cooperative and non-cooperative aircraft (airspace surveillance)	Identify the cooperative and non-cooperative detect-and-avoid (DAA) sensor/system capabilities for UA, if applicable. *Rationale: Cooperative and non-cooperative DSAA capabilities are key enablers for UA to safely and routinely access all airspace classes.*
	Roles and responsibilities of the remote pilot to remain clear of collision	Explain the traffic alert system and traffic collision avoidance system (TCAS) phraseologies, and how these systems work. Identify the roles and responsibilities of the remote pilot to remain clear of collision.

	Command, control and communication (C3) link performance and limitations	Know the definition of 'C3'. Understand the relation between communications and effective command and control (C2).

Operation-specific endorsement modules	Areas to be covered	Learning objectives
		Rationale: C3 cannot be accomplished without two-way communications. C3 would be impossible unless the remote pilot can collect feedback in some form. Basic to any C3 system is the incorporation of a reliable communications network.

	Signal or communications latency for the C2 link	Understand the impact of signal or communications latency on the C2 link. Explain what can cause, and how to detect, a signal or communications latency. Describe the actions that are required following a signal or communications latency. *Rationale: BVLOS control may require a satellite communications link that implies a level of signal delay, or signal latency, which may impact on the accuracy of the BVLOS operation.*

	Planning for the loss of C2 link or for system failure	Understand the impact of a loss of C2 link. Explain what can cause, and how to detect, a system failure. Describe the actions that are required following a loss of C2 link.
	Interpreting separate	Interpret different data sources to

Operation-specific endorsement modules	**Areas to be covered**	**Learning objectives**
	Crew resource	Explain the importance of CRM for
Low-altitude (below	Air traffic management	Describe the ATM procedures for low-altitude operations.

500 ft) operations	(ATM) procedures	
	Radio communications and phraseology	Define the meaning of 'standard words and phrases'. Recognise, describe, and use the
	Situational awareness	Keep situational awareness,
	Advanced aviation terminology	Explain the meaning of low-altitude operations related terminology.
Flight in **non-segregated** **airspace**	Clear roles and responsibilities	Describe the relationship between the initiating causes (or threats), the hazard (top (main) event), the risk mitigations (the controls and barriers), and the potential consequential results (loss states) when conducting a flight in a non-segregated airspace.
	Wake turbulence	State the wake turbulence categories for
Transport and/or **dropping of cargo**	Weight and balance	Describe the relationship between UA mass and structural stress.

		Describe why mass should be limited to ensure adequate margins of strength. Describe the relationship between UA mass and aircraft performance. Describe why UA mass should be limited to ensure adequate aircraft performance.

Operation-specific endorsement modules	Areas to be covered	Learning objectives

		Depending on the type of operation, describe the relationship between centre-of-gravity (CG) position and stability/controllability of the UA. Describe the consequences if the CG is in front of the forward limit. Describe the consequences if the CG is behind the aft limit. Describe the relationship between CG position and aircraft performance. Describe the effects of the CG position on the performance parameters (speed, altitude, endurance, and range).

		Be familiar with the abbreviations regarding mass and balance, e.g. (maximum) take-off mass ((M)TOM), (maximum) landing mass ((M)LM), basic empty mass (BEM), dry operating mass (DOM), operating mass (OM), and zero-fuel mass (ZFM). Describe the effects of changes in the load when dropping an object. Describe the effects of an unintended loss of the load. *Rationale: Mass and balance are extremely important for a UA. A UA that is not in balance may become difficult to control. Therefore, the overall balance should be considered when adding payloads, attaching gimbals, etc.*
Operation-specific endorsement modules	**Areas to be covered**	**Learning objectives**

	Load securing and awareness of dangerous goods	Calculate the MTOM and the MLM.
		Explain the reasons for restraining or securing cargo loads.
		Describe the basic methods of restraining or securing loads.
		Explain why the transport of dangerous goods by air is subject to an additional training module.
		State that certain articles and substances, which would otherwise be classified as dangerous goods, may be exempted if they are part of the UA equipment.
		Rationale: The safe operation of the UAS requires to weigh all cargo in the UA (or provide an accurate estimate of weight using 'standard' values), load it correctly, and secure it to prevent loss or movement of the cargo during the flight.

		Loading should be performed in accordance with the applicable regulations and limitations. The UAS operator's loading procedures should be in accordance with the instructions given by the person that has the overall responsibility for the loading process for a particular UA flight. These *loading instructions should match the* *requirements for cargo distribution that are* *included in the UA load and trim sheet.*
Operation-specific **endorsement modules**	**Areas to be covered**	**Learning objectives**

Transport of dangerous goods	Safe transport of dangerous goods	Explain the terminology relevant to dangerous goods. Be able to recognise dangerous goods and understand their labelling. Be able to interpret the documentation related to dangerous goods. Recognise dangerous goods by using 'safety data sheets' and the consumer labelling of the Globally Harmonized System of Classification and Labelling of Chemicals (GHS). Explain that the provisions for the transport of dangerous goods by air are included in ICAO Doc 9284 'Technical Instructions for the Safe Transport of Dangerous Goods by Air'.

		State the emergency/reporting procedures in case of an event with dangerous goods, including that in the event of a dangerous-goods-related emergency regarding the UA, the remote pilot should inform the ATC organisation of the transport of dangerous goods. Explain the principles of compatibility and segregation of dangerous goods. Explain the special requirements for loading radioactive materials. Explain the use of the dangerous goods list. Explain the procedures for collecting safety data, e.g. reporting accidents, incidents, and occurrences with dangerous goods.

		Note: The learning objectives should be derived from the Technical Instructions and should be commensurate with the personnel responsibilities.
Operation-specific endorsement modules	**Areas to be covered**	**Learning objectives**
Operations with	Limitations related to human factors	Understand the human performance limitations in an operation with multiple UASs, including UAS swarms.

multiple UASs and		
swarms	Recognising system failures	Describe the different failures that may potentially
	Emergency containment procedures	List the different emergency containment procedures and describe the basic conditions for each kind of emergency.
		Describe the recovery techniques in the event of engine or battery failure during multiple/swarming UAS operations.
UAS launch and recovery using special equipment	Operating procedures	Explain the specific procedures for launch and recovery operations.
		Explain the impact on the UA's behaviour when the systems for launch and recovery are operated from a moving vehicle, including ships.
	Recognising failures	Describe the different failures that may occur during launch and recovery operations.

Operation-specific endorsement modules	Areas to be covered	Learning objectives
Flying over hilly environment	Temperature inversions	Describe the following: — the effect of thermic-induced turbulence near the Earth's surface; — surface effects; — diurnal and seasonal variations; — the effect of clouds; and — the effect of wind. *Rationale: The temperature can affect the density altitude. If the UA flies on a hot and humid day, the remote pilot will*

		experience poor UA performance: as the temperature increases, the air molecules spread out. As a result, the propellers or motors of the UA do not have much air to grab on to.
	Orographic lifting	Describe the effect of exploiting orographic lifting (i.e. slope or ridge) and the actions required. Describe the vertical movements, wind shear, and turbulence, which are typical of hilly environment. *Rationale: Orographic lifting occurs when an air mass is forced from a low elevation to a higher* *elevation as it moves over rising terrain. As the air mass gains altitude, it quickly cools down adiabatically, which can raise the relative humidity to 100 %, create clouds and, under the right conditions, cause precipitation[1].*

Operation-specific endorsement modules	Areas to be covered	Learning objectives
	Higher winds through passes	Describe the effects of wind shear and the actions required when wind shear is encountered at take- off and approach. Describe the precautions to be taken when wind shear is suspected at take-off and approach. Describe the effects of wind shear and the actions required following entry into
	Mountain waves	Explain the origin and formation of mountain waves. State the conditions necessary for the formation of mountain waves. Describe the structure and properties of mountain waves.

		Explain how mountain waves may be identified through their associated meteorological phenomena. Explain that mountain wave effects may exceed the performance or structural capability of the UA. Explain that mountain wave effects may be propagated from low to high levels. Indicate the turbulent zones (mountain waves, rotors) on a drawing of a mountain chain.
	High- and low-pressure patterns	Describe the movements of fronts and pressure systems, and the life cycle of a midlatitude depression. State the rules for predicting the direction and the speed of movement of fronts.

		State the difference in the speed of cold and warm fronts. State the rules for predicting the direction and the speed of frontal depressions.
	Density altitude effects	Define pressure altitude and air density altitude. Explain the effects of all-up mass (AUM), pressure, temperature, density altitude, and humidity. Explain the influence of density altitude on the equilibrium of forces and

GM1 UAS.SPEC.050(1)(d)(iii) Responsibilities of the UAS operator

COORDINATION OF THE UAS OPERATOR WITH THE DESIGNATED ENTITY(IES)

For UAS operations that require an operational authorisation, the training of the remote pilots must be provided in coordination with the entity(ies) that is (are) designated by the Authority, only if the Authority has nominated entities that meet the applicable criteria to provide the required training. If the Authority has not designated any entity, then such coordination is not required.

AMC1 UAS.SPEC.050(1)(g) Responsibilities of the UAS operator

LOGGING OF FLIGHT ACTIVITIES AND RECORD-KEEPING

(a) An acceptable means to log and record the flight activities is to use a logbook, which may be electronic.

(b) The information to be recorded should be indicated in the declaration or in the operational authorisation, which may include the following:

(1) the identification of the UAS (manufacturer, model/variant (e.g. serial number);

NOTE: if the UAS is not subject to registration, the identification of the UAS may be done using the serial number of the UAS.

(2) the date, time, and location of the take-off and landing;

(3) the duration of each flight;

(4) the total number of flight hours/cycles;

(5) in the case of a remotely piloted operation, the name of the remote pilot responsible for the flight;

(6) the activity performed (add the reference to the STS or the authorisation number, as applicable);

(7) any significant incident or accident that occurred during the operation;

(8) a completed pre-flight inspection;

(9) any defects and rectifications;

(10) any repairs and changes to the UAS configuration; and

(11) the information required to comply with UAS.SPEC.100.

(c) Records should be stored for 2 years in a manner that ensures their protection from unauthorised access, damage, alteration, and theft.

(d) The logbook can be generated in one of the following formats: electronic or paper. If the paper format is used, it should contain, in a single volume, all the pages needed to log the holder's flight time. When one volume is completed, a new one will be started based on the cumulative data from the previous one.

UAS.SPEC.060 Responsibilities of the remote pilot

1. The remote pilot shall:

(a) ~~be in a physical and mental condition such that would not endanger the safe operation of the UAS;~~ not perform duties under the influence of psychoactive substances or alcohol or when it is unfit to perform its tasks due to injury, fatigue, medication, sickness or other causes;

(b) have the appropriate remote pilot competency as defined in the operational authorisation, in the standard scenario defined in Appendix 1 or as defined by the LUC and carry a proof of competency while operating the UAS.; and

(c) ~~comply with UAS.SPEC.050 and UAS.SPEC.060 if the remote pilot is also the UAS operator.~~ be familiar with manufacturer's instructions provided by the manufacturer of the UAS.

2. Before starting a UAS operation, the remote pilot shall:

(a) obtain updated information, relevant to the intended operation, about ~~any flight restrictions or conditions established by the Member State of operation~~ about any geographical zones defined in accordance with Article 15;

(b) ensure that the operating environment is compatible with the authorised or declared limitations and conditions ~~or with the model clubs' and associations' procedures; ensure that the UAS is in a safe condition to complete the intended flight safely; and~~

(c) ensure that the UAS is in a safe condition to complete the intended flight safely, and if applicable, check if the direct remote identification is active and up-to-date;

(d) ensure that the information about the operation has been made available to the relevant air traffic service (ATS) unit, other airspace users and relevant stakeholders, as required by the operational authorisation or by the conditions published by the Member State for the geographical zone of operation in accordance with Article 15.

3. During the flight, the remote pilot shall:

(a) comply with the authorised or declared limitations and conditions ~~or with the model clubs' and associations' procedures, as applicable~~;

(b) avoid any risk of collision with any manned aircraft and discontinue a flight when continuing it may pose a risk to other aircraft, people, animals, environment or property;

(c) comply with the operational limitations in geographical zones defined in accordance with Article 15;

(d) comply with the operator's procedures;

(e) not fly close to or inside areas where an emergency response effort is ongoing unless they have permission to do so from the responsible emergency response services.

AMC1 UAS.SPEC.060(2)(b) Responsibilities of the remote pilot

OPERATING ENVIRONMENT

(a) The remote pilot, or the UAS operator in the case of an autonomous operation, should check any conditions that might affect the UAS operation, such as the locations of people, property, vehicles, public roads, obstacles, aerodromes, critical infrastructure, and any other elements that may pose a risk to the safety of the UAS operation.

(b) Familiarisation with the environment and obstacles should be conducted through a survey of the area where the operation is intended to be performed.

(c) It should 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 compatible with those defined in the manufacturer's manual, as well as with the operational authorisation or declaration, as applicable.

(d) The remote pilot should be familiar with the light conditions and make a reasonable effort to identify potential sources of electromagnetic energy, which may cause undesirable effects, such as EMI or physical damage to the operational equipment of the UAS.

AMC1 UAS.SPEC.060(2)(c) Responsibilities of the remote pilot

THE UAS IS IN A SAFE CONDITION TO COMPLETE THE INTENDED FLIGHT

The remote pilot, or the operator in the case of an autonomous operation, should:

(a) update the UAS with data for the geo-awareness function if one is available on the UA;

(b) ensure that the UAS is fit to fly and complies with the instructions and limitations provided by the manufacturer;

(c) ensure that any payload carried is properly secured and installed, respecting the limits for the mass and CG of the UA;

(d) ensure that the UA has enough propulsion energy for the intended operation based on:

(i) the planned operation; and

(ii) the need for extra energy in case of unpredictable events; and

(e) for a UAS equipped with a loss-of-data-link recovery function, ensure that the recovery function allows a safe recovery of the UAS for the envisaged operation; for programmable loss-of-datalink recovery functions, the remote pilot may have to set up the parameters of this function to adapt it to the envisaged operation.

UAS.SPEC.070 Transferability of an operational authorisation

An operational authorisation is not transferable.

UAS.SPEC.080 Duration and validity of an operational authorisation

1. The Authority shall specify in the operational authorisation its duration.

2. Notwithstanding paragraph 1, the authorisation remains valid provided that:

~~(a)~~ the UAS operator remains in compliance with the relevant requirements of this Regulation and with the conditions defined in the operational authorisation.

3. Upon revocation or surrender of the operational authorisation the UAS operator shall provide an acknowledgment in digital format that must be returned to the Authority without delay.

UAS.SPEC.085 Duration and validity of an operational declaration

The operational declaration shall have a limited duration of 2 years. The declaration shall no longer be considered as complete within the meaning of point (4) of point UAS.SPEC.020 if:

(1) during the oversight of the UAS operator, the Authority has found that the UAS operation is not conducted in accordance with the operational declaration;

(2) the conditions of the UAS operation have changed to the extent that the operational declaration no longer complies with the applicable requirements of this MCAR;

(3) the Authority is not granted access in accordance with point UAS.SPEC.090.

UAS.SPEC.090 Access

For the purpose of demonstrating compliance with this MCAR, a UAS operator shall grant any person that is duly authorised by the A uthority access to any facility, UAS, document, records, data, procedures or to any other material relevant to its activity which is subject to authorisation or declaration, regardless of whether or not its activity is contracted or subcontracted to another organisation.

(1) Where the UAS operator uses an unmanned aircraft for which a certificate of restricted certificate of airworthiness has been issued, the UAS operator shall unmanned aircraft system complies with Delegated Regulation (EU) 2024/1107;

(2) Where the UAS operator uses certified equipment on an unmanned aircraft for which certificate of airworthiness nor a restricted certificate of airworthiness have be UAS operator shall carry out all of the following tasks:

(i) record the operation or service time in accordance with either the inprocedures applicable to the certified equipment;

(ii) follow the instructions referred to in the equipment certificate, and also co-applicable airworthiness directives issued by the primary Certification Authority;

(iii) implement any safety measures mandated by the Authority;

(iv) use any relevant mandatory safety information issued by the Agency.

GM1 UAS.SPEC.100 The use of certified equipment and certified

GENERAL

For the purposes of UAS.SPEC.100, ‘certified equipment’ is considered to be any equipment for which the relevant design organisation has demonstrated compliance with the applicable certification specifications and received a form of recognition from EASA that attests such compliance (e.g. an ETSO authorisation). This process is independent from the CE marking process.

The use of certified equipment or certified UA in the ‘specific’ category of operation does not imply a transfer of the flight activities into the ‘certified’ category of operation. However, the use of certified equipment or certified UA in the ‘specific’ category should be considered as a risk reduction and/or mitigation measure in the SORA.

LIGHT UAS OPERATOR CERTIFICATE (LUC)

UAS.LUC.010 General requirements for an LUC

(1) A legal person is eligible to apply for an LUC under this Part.

(2) An application for an LUC or for an amendment to an existing LUC shall be submitted to the Authority and shall contain all of the following information:

(a) a description of the UAS operator's management system, including its organisational structure and safety management system;

(b) the name(s) of the responsible UAS operator's personnel, including the person responsible for authorising operations with UASs;

(c) a statement that all the documentation submitted to the Authority has been verified by the applicant and found to comply with the applicable requirements.

(3) If the requirements of this Part are met, a LUC holder may be granted the privileges, in accordance with point MCAR-UAS.LUC.060.

GM1 UAS.LUC.010 General requirements for an LUC

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UAS operators may decide to apply for authorisations or issue declarations, as applicable, for their operations, or apply for an LUC.

An LUC holder is considered to be a UAS operator; therefore, they must register in accordance with Regulations 7 and 12 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and can do it in parallel to the LUC application.

AMC1 UAS.SPEC.060(2)(c) Responsibilities of the remote pilot

APPLICATION FOR AN LUC

The application should include at least the following information:

(a) Name and address of the applicant's principal place of business.

(b) Statement that the application serves as a formal application for a LUC.

(c) Statement that all the documentation submitted to the Authority has been verified by the applicant and found to comply with the applicable requirements.

(d) Desired date for the operation to commence.

(e) Signature of the applicant's accountable manager.

(f) List of attachments that accompany the formal application (the following is not an exhaustive list):

(i) name(s) of the responsible UAS operator's personnel, including the accountable manager, operations, maintenance and training managers, the safety manager and security manager, the person responsible for authorising operations with UASs;

(ii) list of UASs to be operated;

(iii) details of the method of control and supervision of operations to be used;

(iv) identification of the operation specifications sought;

(v) OM and safety management manual (SMM). (Note: the OM and SMM may be combined under the LUC Manual);

(vi) schedule of events in the process to gain the LUC certificate with appropriate events addressed and target dates;

(vii) documents of purchase, leases, contracts or letters of intent;

(viii) arrangements for the facilities and equipment required and available; and

(ix) arrangements for crew and ground personnel training and qualification.

UAS.LUC.020 Responsibilities of the LUC holder

The LUC holder shall:

(1) comply with the requirements of points MCAR-UAS.SPEC.050 and MCAR-UAS.SPEC.060;

(2) comply with the scope and privileges defined in the terms of approval;

(3) establish and maintain a system for exercising operational control over any operation conducted under the terms of its LUC;

(4) carry out an operational risk assessment of the intended operation in accordance with Subpart D of this MCAR unless conducting an operation for which an operational declaration is sufficient according to point MCAR-UAS.SPEC.020,

(5) keep records of the following items in a manner that ensures protection from damage, alteration and theft for a period at least 3 years for operations conducted using the privileges specified under point MCAR-UAS.LUC.060:

(a) the operational risk assessment, when required according to point (4), and its supporting documentation;

(b) mitigation measures taken; and

(c) the qualifications and experience of personnel involved in the UAS operation, compliance monitoring and safety management;

(6) keep personnel records referred to in point (5)(c) as long as the person works for the organisation and shall be retained until 3 years after the person has left the organisation.

AMC1 UAS.LUC.020(3) Responsibilities of the LUC holder

OPERATIONAL CONTROL

The organisation and methods established by the LUC holder to exercise operational control within its organisation should be included in the OM as an additional chapter in relation to the template provided in GM1 MCAR-UAS.SPEC.030(3)(e).

GM1 UAS.LUC.020(3) Responsibilities of the LUC holder

OPERATIONAL CONTROL

'Operational control' should be understood as the responsibility for the initiation, continuation, termination or diversion of a flight in the interest of safety.

'System' in relation to operational control should be understood as the organisation, methods, documentation, personnel and training of those personnel for the initiation, continuation, termination or diversion of a flight in the interest of safety.

AMC1 UAS.LUC.020(5) Responsibilities of the LUC holder

RECORD-KEEPING — GENERAL

The record-keeping system should ensure that all records are stored in a manner that ensures their protection from damage, alteration and theft. They should be accessible on request of the Authority, whenever needed within a reasonable time. These records should be organised in a way that ensures traceability, availability and retrievability throughout the required retention period. The retention period starts when the record was created or last amended. Adequate backups should be ensured.

UAS.LUC.030 Safety management system

(1) An UAS operator who applies for an LUC shall establish, implement and maintain a safety management system corresponding to the size of the organisation, to the nature and complexity of its activities, taking into account the hazards and associated risks inherent in these activities.

(2) The UAS operator shall comply with all of the following:

(a) nominate an accountable manager with authority for ensuring that within the organisation all activities are performed in accordance with the applicable standards and that the organisation is continuously in compliance with the requirements of the management system and the

procedures identified in the LUC manual referred to in point MCAR-UAS.LUC.040;

(b) define clear lines of responsibility and accountability throughout the organisation;

(c) establish and maintain a safety policy and related corresponding safety objectives;

(d) appoint key safety personnel to execute the safety policy;

(e) establish and maintain a safety risk management process including the identification of safety hazards associated with the activities of the UAS operator, as well as their evaluation and the management of associated risks, including taking action to mitigate those risks and verify the effectiveness of the action;

(f) promote safety in the organisation through:

(i) training and education;

(ii) communication;

(g) document all safety management system key processes for making personnel aware of their responsibilities and of the procedure for amending this documentation; key processes include:

(i) safety reporting and internal investigations;

(ii) operational control;

(iii) communication on safety;

(iv) raining and safety promotion;

(v) compliance monitoring;

(vi) safety risk management;

(vii) management of change;

(viii) interface between organisations;

(ix) use of sub-contractors and partners;

(h) include an independent function to monitor the compliance and adequacy of the fulfilment of the relevant requirements of this Regulation, including a system to provide feedback of findings to the accountable manager to ensure effective implementation of corrective measures as necessary;

(i) include a function to ensure that safety risks inherent to a service or product delivered through subcontractors are assessed and mitigated under the operator's safety management system.

(3) If the organisation holds other organisation certificates within the scope of the Civil Aviation Regulations, the safety management system of the UAS operator may be integrated with the safety management system that is required by any of those additional certificate(s).

AMC1 UAS.LUC.030(2) Safety management system

PERSONNEL REQUIREMENTS — GENERAL

(a) The accountable manager should have the authority to ensure that all activities are carried out in accordance with the requirements of the UAS Regulation.

(b) The safety manager should:

(1) facilitate hazard identification, risk analysis, and risk management;

(2) monitor the implementation of risk mitigation measures;

(3) provide periodic reports on safety performance;

(4) ensure maintenance of the safety management documentation;

(5) ensure that there is safety management training available and that it meets acceptable standards;

(6) provide all the personnel involved with advice on safety matters; and

(7) ensure the initiation and follow-up of internal occurrence investigations.

(c) Management and other personnel of the LUC holder should be qualified for the planned operations in order to meet the relevant requirements of this MCAR.

(d) The LUC holder should ensure that its personnel receive appropriate training to remain in compliance with the relevant requirements of this MCAR.

GM1 UAS.LUC.030(2)(a) Safety management system

ACCOUNTABLE MANAGER

The accountable manager is a single, identifiable person who has the responsibility for the effective and efficient performance of the LUC holder's safety management system.

AMC1 UAS.LUC.030(2)(c) Safety management system

SAFETY POLICY

(a) The safety policy should:

(1) be endorsed by the accountable manager;

(2) reflect organisational commitments regarding safety, and its proactive and systematic management;

(3) be communicated, with visible endorsement, throughout the organisation;

(4) include internal reporting principles, and encourage personnel to report errors related to UAS operations, incidents and hazards; and

(5) recognise the need for all personnel to cooperate with compliance monitoring and safety investigations.

(b) The safety policy should include a commitment to:

(1) improve towards the highest safety standards;

(2) comply with all applicable legislation, meet all applicable standards, and consider best practices;

(3) provide appropriate resources;

(4) apply the human factors principles;

(5) enforce safety as a primary responsibility of all managers; and

(6) apply 'just culture' principles and, in particular, not to make available or use the information on occurrences:

(i) to attribute blame or liability to someone for reporting something which would not have been otherwise detected; or

(ii) for any purpose other than the improvement of safety.

(c) The senior management of the UAS operator should:

(1) continually promote the UAS operator's safety policy to all personnel, and demonstrate their commitment to it;

(2) provide the necessary human and financial resources for the implementation of the safety policy; and

(3) establish safety objectives and associated performance standards.

GM1 UAS.LUC.030(2)(c) Safety management system

SAFETY POLICY

The safety policy is the means whereby an organisation states its intention to maintain and, where practicable, improve safety levels in all its activities and to minimise its contribution to the risk of an accident or serious incident as far as is reasonably practicable. It reflects the management's commitment to safety, and should reflect the organisation's philosophy of safety management, as well as be the foundation on which the organisation's safety management system is built. It serves as a reminder of 'how we do business here'. The creation of a positive safety culture begins with the issuance of a clear, unequivocal direction.

The commitment to apply 'just culture' principles forms the basis for the organisation's internal rules that describe how 'just culture' principles are guaranteed and implemented.

For organisations that have their principal place of business in the Republic of Mauritius, the 'just culture' principles to be applied (refer in particular to MCAR SMS).

GM1 UAS.LUC.030(2)(d) Safety management system

PERSONNEL REQUIREMENTS

The functions of the safety manager may be fulfilled by the accountable manager or another person charged by the UAS operator with the responsibility of ensuring that the UAS operator remains in compliance with the requirements of the UAS Regulation.

Where the safety manager already fulfils the functions of the compliance monitoring manager, the accountable manager cannot be the safety manager.

Depending on the size of the organisation and the nature and complexity of its activities, the safety manager may be assisted by additional safety personnel for the performance of all the safety management tasks.

Regardless of the organisational set-up, it is important that the safety manager remains the unique focal point as regards the development, administration, and maintenance of the organisation's management system.

GM2 UAS.LUC.030(2)(d) Safety management system

PERSONNEL REQUIREMENTS

A UAS operator may include a safety committee in the organisational structure of its safety management system and, if needed, one or more safety action groups.

(a) Safety committee

A safety committee may be established to support the accountable manager in their safety responsibilities. The safety committee should monitor:

(1) the UAS operator's performance against safety objectives and performance standards;

(2) whether safety action is taken in a timely manner; and

(3) the effectiveness of the UAS operator's safety management processes.

(b) Safety action group

(1) Depending on the scope of the task and the specific expertise required, one or more afety action groups should be established to assist the safety manager in their functions.

(2) The safety action group should be comprised of managers, supervisors and personnel from operational areas, depending on the scope of the task and the specific expertise required.

(3) The safety action group should at least perform the following:

(i) monitor operational safety and assess the impact of operational changes on safety;

(ii) define actions to mitigate the identified safety risks; and

(iii) ensure that safety measures are implemented within agreed timescales.

GM3 UAS.LUC.030(2)(d) Safety management system

KEY SAFETY PERSONNEL

The UAS operator should appoint personnel to manage key fields of activity such as operations, maintenance, training, etc.

AMC1 UAS.LUC.030(2)(g) Safety management system

DOCUMENTATION

The safety management system documentation of the LUC holder should be included in an SMM or in the LUC manual. If that documentation is contained in more than one operator's manual and is not duplicated, cross references should be provided.

GM1 UAS.LUC.030(2)(g)(i) Safety management system

SAFETY REPORTING AND INTERNAL INVESTIGATIONS

The purpose of safety reporting and internal investigations is to use reported information to improve the level of safety performance of the UAS operator. The purpose is not to attribute blame or liability.

The specific objectives of safety reporting and internal investigations are to:

(a) enable assessments of the safety implications of each relevant incident and accident, including previous similar occurrences, so that any necessary action can be initiated; and

(b) ensure that knowledge of relevant incidents and accidents is disseminated so that other persons and UAS operators may learn from them.

All occurrence reports that are considered to be reportable by the person who submits the report should be retained, as the significance of such reports may only become obvious at a later date.

AMC1 UAS.LUC.030(2)(g)(iii) Safety management system

COMMUNICATION ON SAFETY

(a) The organisation should establish communication about safety matters that:

(1) ensures that all personnel are aware of the safety management activities as appropriate for their safety responsibilities;

(2) conveys safety-critical information, especially information related to assessed risks and analysed hazards;

(3) explains why particular actions are taken; and

(4) explains why safety procedures are introduced or changed.

(b) Regular meetings with personnel, where information, actions, and procedures are discussed, may be used to communicate safety matters.

GM1 UAS.LUC.030(2)(g)(iv) Safety management system

TRAINING AND SAFETY PROMOTION

Training, combined with safety communication and information sharing form part of safety promotion and supplement the organisation's policies, encouraging a positive

safety culture and creating an environment that is favourable to the achievement of the organisation's safety objectives.

Safety promotion can also be the instrument for the development of a just culture.

Depending on the particular risk, safety promotion may constitute or complement a risk mitigation action and an effective reporting system.

AMC1 UAS.LUC.030(2)(g)(v) Safety management system

COMPLIANCE MONITORING

(a) The accountable manager should designate a manager to monitor the compliance of the LUC holder with:

(1) the terms of approval, the privileges, the risk assessment and the resulting mitigation measures;

(2) all operator's manuals and procedures; and

(3) training standards.

(b) The compliance monitoring manager should:

(1) have knowledge of, and experience in, compliance monitoring;

(2) have direct access to the accountable manager to ensure that findings are addressed, as necessary; and

(3) not be one of the other persons referred to in MCAR-UAS.LUC.030(2)(d).

(c) The tasks of the compliance monitoring manager may be performed by the safety manager, provided that the latter has knowledge of, and experience in, compliance monitoring.

(d) The compliance monitoring function should include audits and inspections of the LUC holder. The audits and inspections should be carried out by personnel who are not responsible for the function, procedure or products being audited.

(e) An organisation should establish an audit plan to show when and how often the activities as required by this MCAR will be audited.

(f) The independent audit should ensure that all aspects of compliance, including all the subcontracted activities, are checked within a period defined in the scheduled plan, and agreed by the Authority.

(g) Where the organisation has more than one approved location, the compliance monitoring function should describe how these locations are integrated into the

system and include a plan to audit each location in a risk-based programme as agreed by the Authority.

(h) A report should be raised each time an audit is carried out, describing what was checked and the resulting findings against applicable requirements and procedures.

(i) The feedback part of the compliance monitoring function should address who is required to rectify any non-compliance in each particular case, and the procedure to be followed if rectification is not completed within appropriate timescales. The procedure should lead to the accountable manager.

(j) The LUC holder should be responsible for the effectiveness of the compliance monitoring function, in particular for the effective implementation and follow-up of all corrective measures.

GM1 UAS.LUC.030(2)(g)(v) Safety management system

COMPLIANCE MONITORING

The primary objective of the compliance monitoring function is to enable the UAS operator to ensure a safe operation and to remain in compliance with this MCAR.

An external organisation may be contracted to perform compliance monitoring functions. In such cases, that organisation should designate the compliance monitoring manager.

The compliance monitoring manager may use one or more auditors to carry out compliance audits and inspections of the LUC holder under their own responsibility.

AMC1 UAS.LUC.030(2)(g)(vi) Safety management system

SAFETY RISK MANAGEMENT

The LUC holder should have a safety management system that is able to perform at least the following:

(a) identify hazards through reactive, proactive, and predictive methodologies, using various data sources, including safety reporting and internal investigations;

(b) collect, record, analyse, act on and generate feedback about hazards and the associated risks that affect the safety of the operational activities of the UAS operator;

(c) develop an operational risk assessment as required by Subpart D of this MCAR;

(d) carry out internal safety investigations;

(e) monitor and measure safety performance through safety reports, safety reviews, in particular during the introduction and deployment of new technologies, safety audits, including periodically assessing the status of safety risk controls, and safety surveys;

(f) manage the safety risks related to a change, using a documented process to identify any external and internal change that may have an adverse effect on safety; the management of change should make use of the UAS operator's existing hazard identification, risk assessment, and mitigation processes;

(g) manage the safety risks that stem from products or services delivered through subcontractors, by using its existing hazard identification, risk assessment, and mitigation processes, or by requiring that the subcontractors have an equivalent process for hazard identification and risk management; and

(h) respond to emergencies using an ERP that reflects the size, nature, and complexity of the activities performed by the organisation, considering AMC3 MCAR-UAS.SPEC.030(3)(e). The ERP should:

(1) contain the action to be taken by the UAS operator or the specified individuals in an emergency;

(2) provide for a safe transition from normal to emergency operations and vice versa;

(3) ensure coordination with the ERPs of other organisations, where appropriate; and

(4) describe emergency training/drills, as appropriate.

GM1 UAS.LUC.030(2)(g)(vi) Safety management system

SAFETY RISK MANAGEMENT

In very broad terms, the objective of safety risk management is to eliminate risk, where practical, or reduce the risk (likelihood/severity) to acceptable levels, and to manage the remaining risk to avoid or mitigate any possible undesirable outcome. Safety risk management is, therefore, integral to the development and application of effective safety management.

Safety risk management can be applied at many levels in an organisation. It can be applied at the strategic level and at operational levels. The potential for human error, its influences and sources, should be identified and managed through the safety risk management process. Human factors risk management should allow the organisation to determine where it is vulnerable to human performance limitations

GM1 UAS.LUC.030(2)(g)(vii) Safety management system

MANAGEMENT OF CHANGE

Unless properly managed, changes in organisational structures, facilities, the scope of work, personnel, documentation, policies and procedures, etc. can result in the inadvertent introduction of new hazards, which expose the organisation to new, or increased risk. Effective organisations seek to improve their processes, with conscious recognition that changes can expose the organisations to potentially latent hazards and risks if the changes are not properly and effectively managed.

Regardless of the magnitude of a change, large or small, proactive consideration should always be given to the safety implications. This is primarily the responsibility of the team that proposes and/or implements the change. However, change can only be successful if all the personnel affected by the change are engaged and involved, and they participate in the process. The magnitude of a change, its safety criticality, and its potential impact on human performance should be assessed in any change management process.

The process for the management of change typically provides principles and a structured framework for managing all aspects of the change. Disciplined application of change management can maximize the effectiveness of the change, engage staff, and minimise the risks inherent in change.

Change is the catalyst for an organisation to perform the hazard identification and risk management processes.

Some examples of change include, but are not limited to:

(a) changes to the organisational structure;

(b) a new type of UAS being employed;

(c) additional UASs of the same or similar type being acquired;

(d) significant changes in personnel (affecting key personnel and/or large numbers of personnel, high turn-over);

(e) new or amended regulations;

(f) changes in financial status;

(g) new location(s), equipment, and/or operational procedures; and

(h) new subcontractors.

A change may have the potential to introduce new human factors issues, or exacerbate pre-existing issues. For example, changes in computer systems, equipment, technology, personnel (including the management), procedures, the work organisation, or work processes are likely to affect performance.

The purpose of integrating human factors into the management of change is to minimise potential risks by specifically considering the impact of the change on the people within a system.

Special consideration, including any human factors issues, should be given to the 'transition period'. In addition, the activities utilised to manage these issues should be integrated into the change management plan.

Effective management of change should be supported by the following:

(a) implementation of a process for formal hazard analyses/risk assessment for major operational changes, major organisational changes, changes in key personnel, and changes that may affect the way a UAS operation is carried out;

(b) identification of changes likely to occur in business which would have a noticeable impact on:

(1) resources — material and human;

(2) management guidance — processes, procedures, training; and

(3) management control;

(c) safety case/risk assessments that are focused on aviation safety; and

(d) involvement of key stakeholders in the change management process as appropriate.

During the change management process, previous risk assessments and existing hazards are reviewed for possible effects.

GM1 UAS.LUC.030(2)(g)(viii) Safety management system

SAFETY RISK MANAGEMENT — INTERFACES BETWEEN ORGANISATIONS

Safety risk management processes should specifically address the planned implementation of, or participation in, any complex arrangements (such as when multiple organisations are contracted, or when multiple levels of contracting/subcontracting are included).

Hazard identification and risk assessment start with the identification of all parties involved in the arrangement, including independent experts and non-approved organisations. This extends to the overall control structure, and assesses in particular the following elements across all subcontract levels and all parties within such arrangements:

(a) coordination and interfaces between the different parties;

(b) applicable procedures;

(c) communication between all the parties involved, including reporting and feedback channels;

(d) task allocation, responsibilities and authorities; and

(e) the qualifications and competency of key personnel.

Safety risk management should focus on the following aspects:

(a) clear assignment of accountability and allocation of responsibilities;

(b) only one party is responsible for a specific aspect of the arrangement — there should be no overlapping or conflicting responsibilities, in order to eliminate coordination errors;

(c) the existence of clear reporting lines, both for occurrence reporting and progress reporting; and

(d) the possibility for staff to directly notify the organisation of any hazard by suggesting an obviously unacceptable safety risk as a result of the potential consequences of this hazard.

Regular communication between all parties to discuss work progress, risk mitigation actions, changes to the arrangement, as well as any other significant issues, should be ensured.

AMC1 UAS.LUC.030(2)(g)(ix) Safety management system

USE OF SUBCONTRACTORS

(a) When an LUC holder uses products or services delivered through a subcontractor that is not itself approved in accordance with this Subpart, the subcontractor should work under the terms of the LUC.

(b) Regardless of the certification status of the subcontractor, the LUC holder is responsible for ensuring that all subcontracted products or services are subject to the hazard identification, risk management, and compliance monitoring of the LUC holder.

UAS.LUC.040 LUC manual

(1) An LUC holder shall provide the A uthority with a LUC manual, describing directly or by cross reference its organisation, the relevant procedures and the activities carried out.

(2) The manual shall contain a statement signed by the accountable manager that confirms that the organisation will at all times work in accordance with this Regulation and with the approved LUC manual. When the accountable Manager is not the Chief Executive Officer of the organisation, the chief executive officer shall countersign the statement.

(3) If any activity is carried out by partner organisations or subcontractors, he UAS operator shall include in the LUC manual procedures on how the LUC holder shall manage the relationship with those partner organisations or subcontractors.

(4) The LUC manual shall be amended as necessary to retain an up-to-date description of the LUC holder's organisation, and copies of amendments shall be provided to the Authority.

(5) The UAS operator shall distribute the relevant parts of the LUC manual to all its personnel in accordance with their functions and duties.

AMC1 UAS.LUC.040 LUC manual

GENERAL

(a) The LUC holder should ensure that all personnel are able to understand the language in which those parts of the LUC manual which pertain to their duties and responsibilities are written.

(b) The LUC manual should contain a statement signed by the accountable manager that confirms that the organisation will at all times work in accordance with the UAS Regulation, as applicable, and with the approved LUC manual. When the accountable manager is not the chief executive officer of the organisation, then the chief executive officer shall countersign the statement.

AMC2 UAS.LUC.040 LUC manual

GENERAL

The LUC manual may contain references to the OM, where an OM is compiled in accordance with AMC1 MCAR-UAS.SPEC.030(3)(e).

The LUC manual should contain at least the following information, customised according to the complexity of the UAS operator.

LUC MANUAL TEMPLATE

Operator's name

Table of contents

1. Introduction (the information under Chapter 1 of the OM may be duplicated here or simply referenced in the OM)

2. SMM

2.1. Safety policy (provide details of the UAS operator's safety policy, safety targets)

2.2. Organisational structure (include the organogram and brief description thereof)

2.3. Duties and responsibilities of the accountable manager and key management personnel; (in addition, clearly identify the person who authorises operations)

2.4. Safety management system (provide a description of the safety management system, including the lines of responsibilities with regard to safety matters)

2.5. Operational control system (provide a description of the procedures and responsibilities necessary to exercise operational control with respect to flight safety)

2.6. Compliance monitoring (provide a description of the compliance monitoring function)

2.7. Safety risk management (the information about hazard identification, safety risk assessment and mitigation under Chapter A of the OM may be duplicated here or simply referenced to the OM)

2.8. Management of change (description of the process to identify safety-critical changes within the organisation and its operation and to eliminate or modify safety risk controls that are no longer needed or effective due to such changes)

2.9. Development and approval of an operational scenario (provide a description of the process)

2.10. Interface with subcontractors and partners (describe the relationship with any subcontractor delivering products or services to the UAS operator as well as with partners, if available)

2.11. Documentation of key management system processes

3. OM (the information under Chapters 2-11 of the OM may be duplicated here or references to the OM may be provided)

4. Handling, notifying and reporting accidents, incidents and occurrences

5. Handling of dangerous goods (specify the relevant regulations and instructions to crew members concerning the transport of dangerous goods such as pesticides and chemicals, etc. and the use of dangerous goods during operations such as batteries and fuel cells, engines, magnetizing materials, pyrotechnics, flares and firearms)

AMC1 UAS.LUC.040(3) LUC manual

PROCEDURES FOR SUBCONTRACTORS

If any activity is carried out by partner organisations or subcontractors, the LUC manual should include a relevant statement of how the LUC holder is able to ensure compliance with MCAR-UAS.LUC.030(2)(i), and should contain, directly or by cross reference,

descriptions of, and information on, the activities of those organisations or subcontractors, as necessary to substantiate this statement.

UAS.LUC.050 Terms of approval of the LUC holder

The Authority shall issue an LUC in a manner and format described below in this MCAR after it is satisfied that the UAS operator complies with UAS.LUC.020, UAS.LUC.030 and UAS.LUC.040.

(1) The LUC shall include:

(a) the UAS operator identification;

(b) the UAS operator's privileges;

(c) authorised type(s) of operation;

(d) the authorised area, zone or class of airspace for operations, if applicable;

(e) any special limitations or conditions, if applicable;

AMC1 UAS.SPEC.060(2)(c) Responsibilities of the remote pilot

FORM FOR THE TERMS OF APPROVAL OF AN LUC HOLDER

<table>
<tr><td colspan="3">LIGHT UAS OPERATOR CERTIFICATE (LUC)

(Terms of approval of an LUC holder)</td></tr>
<tr><td rowspan="2">(3)</td><td>State of the operator (1):</td><td rowspan="2">(3)</td></tr>
<tr><td>Issuing Authority(2):</td></tr>
<tr><td>LUC # (4):</td><td>Operator name (5):
Registration number of the UAS operator (6):</td><td>Contact details, at which operational management</td></tr>
</table>

	Operator address (8): Telephone (9): Email (10):	can be contacted without undue delay (7):
This certificate certifies that ……..(5) is authorised to perform UAS operations, as defined in the attached UAS operations specifications, in accordance with the LUC manual, MCAR-UAS and the Civil Aviation (Unmanned Aircraft System) Regulations 2024.		
Date of issue (11):_____	Name and signature (12):_____ Title: _____	

1. Enter the name of the State of the operator.

2. Enter the identification of the issuing Authority.

3. Reserved for use of the Authority.

4. Enter the approval reference (digital and/or letter code) of the LUC, as issued by the Authority.

5. Enter the name of the legal entity of the UAS operator and UAS operator's trading name, if different from the name of the legal entity.

6. Enter the registration number of the UAS operator, provided according to Regulation 7 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

7. Enter contact details such as the telephone numbers, including the country code, and the email address at which operational management can be contacted without undue delay for issues related to UAS operations, the airworthiness of UAS, remote crew competency and other matters as appropriate.

8. Enter the UAS operator's principal place of business address.

9. Enter the UAS operator's principal place of business telephone details, including the country code.

10. Enter the UAS operator's email.

11. Enter the issue date of the LUC (dd-mm-yyyy).

12. Enter the title, name and signature of the Authority representative. In addition, an official stamp may be applied on the LUC.

UAS OPERATIONS SPECIFICATIONS
LUC (1):
Operator name (2):
The UAS operator (2)_____has the privilege to _____(3), subject to the following:
UAS model (4): ;UAS serial number or registration mark (5): _____

Type(s) of UAS operation ([6]) or :	Specifications ([7]):	Special limitations ([8]):	Remarks([9])
1. 2.			
Issuing Authority ([10]): Telephone([11]): Email([12]):			
Date ([13]):			
Signature([14]):			

1. Enter the approval reference (digital and/or letter code) of the LUC, as issued by the Authority.

2. Enter the name of the legal entity of the UAS operator and UAS operator's trading name, if different from the name of the legal entity.

3. Enter any privilege listed in AMC1 UAS.LUC.060 that has been granted.

4. Enter the UAS model.

5. Enter the UAS serial number or the UAS registration mark if applicable.

6. Specify the type(s) of UAS operation (e.g. STS, PDRA when applicable, or type of UAS operations in case the operation is not covered by an STS or a PDRA; the type of UAS operation may be: survey, linear inspection, urban delivery; agricultural, photography, advertising, calibration, construction work, stringing power line, aerial mapping, pollution control, news media, television and movie, flying display, competition, etc.).

7. Enter the relevant specifications describing where the operation is allowed to take place (area of operation or class of airspace for operations; maximum height, BVLOS/VLOS; range; etc.).

8. Enter the limitations related to: restriction of the ground area (i.e. controlled ground area, population density; ground risk buffer); the UAS performance and equipment (i.e. maximum speed; maximum weight etc.); data link or communications; external systems or loads; carriage of dangerous goods, possibility of handover, etc.

9. Enter remarks such as the remote pilot's competency; normal, contingency and emergency procedures.

10. Enter the identification of the issuing Authority.

11. Enter the telephone number of the Authority, including the country code.

12. Enter the email address of the Authority.

13. Issue date of the operations specifications (dd-mm-yyyy).

14. Signature of the Authority representative.

UAS.LUC.060 Privileges of the LUC holder

When satisfied with the documentation provided, the Authority shall:

(1) shall specify the terms and conditions of the privilege granted to the UAS operator in the LUC; and

(2) may, within the terms of approval, grant to an LUC holder the privilege to authorise its own operations without:

(a) submitting an operational declaration;

(b) applying for an operational authorisation.

AMC1 UAS.LUC.060 Privileges of an LUC holder

SCOPE OF PRIVILEGES

Within the terms of its approval, the LUC holder should be able:

(a) without prior declaration to the Authority, to authorise its own operations based on an STS; and

(b) without prior approval of the Authority, to authorise one or more of the following types of own operations:

(1) one based on a PDRA that requires an authorisation;

(2) one based on one or more modifications of an STS (variants), which does not involve changes in the Con Ops, the category of UAS used or the competencies of the remote pilots; or

(3) one that does not correspond to a PDRA, but falls within a type of activity already performed by the UAS operator.

In case of UAS operations that are conducted at SAIL V and VI, the Authority requires the LUC holder to use a UAS with an acceptable Type Certificate (TC). In case of UAS operations that are conducted at SAIL III and IV, the Authority specifies if the LUC holder is required to use a UAS with an acceptable TC.

GM1 UAS.LUC.060 Privileges of an LUC holder

GENERAL

For the purpose of granting privileges to LUC applicants, the Authority may apply a gradual approach. Depending on the UAS operator's past safety performance and safety record over a defined period of time (e.g. the previous 6 months), the Authority may expand the scope of the UAS operator's privileges.

The gradual approach should not be understood as preventing the Authority from granting privileges with a greater scope to a first-time LUC applicant who has an adequate structure and competent personnel, an effective safety management system and has demonstrated a good compliance disposition.

For operations that are conducted at SAIL III and IV, the Authority will requires LUC holders to use a UAS with an acceptable TC.

UAS.LUC.070 Changes in the LUC management system

After an LUC is issued, the following changes require prior approval by the Authority:

1. any change in the terms of approval of the UAS operator; or

2. any significant change to the elements of the LUC holder safety management system as required by MCAR-UAS.LUC.030.

AMC1 UAS.LUC.070(2) Changes in the LUC management system

CHANGES REQUIRING PRIOR APPROVAL

A change of the accountable manager is considered a significant change that requires a prior approval.

UAS.LUC.075 Transferability of an LUC

Except as a result of a change of ownership of the organisation, approved by the Authority in accordance with MCAR-UAS.LUC.070, an LUC is not transferable.

UAS.LUC.080 Duration and validity of an LUC

1. An LUC shall be issued for an unlimited duration. It shall be valid subject to:

   (a) the LUC holder remaining in compliance with the relevant requirements of this MCAR and the Civil Aviation (Unmanned Aircraft System) Regulations 2024, and

   (b) it not being surrendered or revoked.

2. Upon revocation or surrender, the LUC shall be returned to the Authority without delay.

UAS.LUC.090 Access

For the purpose of demonstrating compliance with this this MCAR and the Civil Aviation (Unmanned Aircraft System) Regulations 2024, the LUC holder shall grant any person that is duly authorised by the Authority access to any facility, UAS, document, records, data, procedures or to any other material relevant to its activity which is subject to certification, authorisation or declaration, regardless of whether or not its activity is contracted or subcontracted to another organisation.

Appendix 1 for standard scenarios supporting a declaration

CHAPTER I

1 STS-01 - VLOS OVER A CONTROLLED GROUND AREA IN A POPULATED ENVIRONMENT

UAS.STS-01.010 General provisions

(1) During flight, the unmanned aircraft shall be maintained within 120 m from the closest point of the surface of the earth. The measurement of distances shall be adapted accordingly to the geographical characteristics of the terrain, such as plains, hills, mountains.

(2) When flying an unmanned aircraft within a horizontal distance of 50 m from an artificial obstacle taller than 105 metres, the maximum height of the UAS operation may be increased up to 15 m above the height of the obstacle at the request of the entity responsible for the obstacle.

(3) The maximum height of the operational volume shall not exceed 30 m above the maximum height allowed in points (1) and (2).

(4) During flight, the unmanned aircraft shall not carry dangerous goods.

UAS.STS-01.020 UAS operations in STS-01

(1) UAS operations in STS-01 shall meet all of the following conditions:

(a) be conducted with the unmanned aircraft kept in VLOS at all times;

(b) be conducted in accordance with the operations manual referred to in point (1) of point MCAR-UAS.STS-01.030;

(c) be conducted over a controlled ground area comprising:

(i) for the operation of an untethered unmanned aircraft:

(A) the flight geography area;

(B) the contingency area, with its external limit(s) at least 10 m beyond the limit(s) of the flight geography area; and

(C) the ground risk buffer, which shall cover a distance beyond the external limit(s) of the contingency area that meets at least the following parameters:

	Minimum distance to be covered by the ground risk buffer for untethered unmanned aircraft	
Maximum height above ground	**with an MTOM up to 10 kg**	**with an MTOM above 10 kg**
30 m	10 m	20 m
60 m	15 m	30 m
90 m	20 m	45 m
120 m	25 m	60 m

(ii) operation of a tethered unmanned aircraft, a radius equal to the tether length plus 5 m and centred on the point where the tether is fixed over the surface of the earth.

(d) be conducted at a ground speed of less than 5 m/s in the case of untethered unmanned aircraft;

(e) be conducted by a remote pilot who:

(i) holds a certificate of remote pilot theoretical knowledge in accordance with Attachment A to this Chapter for operations in the standard scenarios issued by the Authority or by an entity designated by the Authority of a Contracting State;

(ii) holds an accreditation of completion of the STS-01 practical skill training, in accordance with Attachment A to this Chapter and issued by:

(A) an entity that has declared compliance with the requirements in Appendix 3 and is recognised by the Authority; or

(B) an UAS operator that has declared to the authority of a Contracting State of registration, compliance with STS-01

and that has declared compliance with the requirements in Appendix 3; and

(f) be conducted with an unmanned aircraft which is marked as class C5 and complies with the requirements of that class, as defined in Subpart E, and is operated with active and updated direct remote identification system.

(2) The remote pilot shall obtain the certificate of theoretical knowledge for operations in the standard scenarios after:

(a) having completed an online training course and passed the online theoretical knowledge examination as referred to in point (4)(b) of point UAS.OPEN.020; and

(b) having passed an additional theoretical knowledge examination provided by the Authority or by an entity designated by the authority of a Contracting State in accordance with Attachment A to this Chapter.

(3) This certificate shall be valid for five years. The revalidation, within its validity period is subject to any of the following:

(a) the demonstration of competencies in accordance with point (2);

(b) the completion of a refresher training addressing the theoretical knowledge subjects as defined in point (2) provided by the Authority or by an entity designated by the Authority.

(4) In order to revalidate the certificate upon its expiration, the remote pilot shall comply with point (2).

GM1 UAS.STS-01.020(1)(c) UAS operations in STS-01

GROUND RISK BUFFER

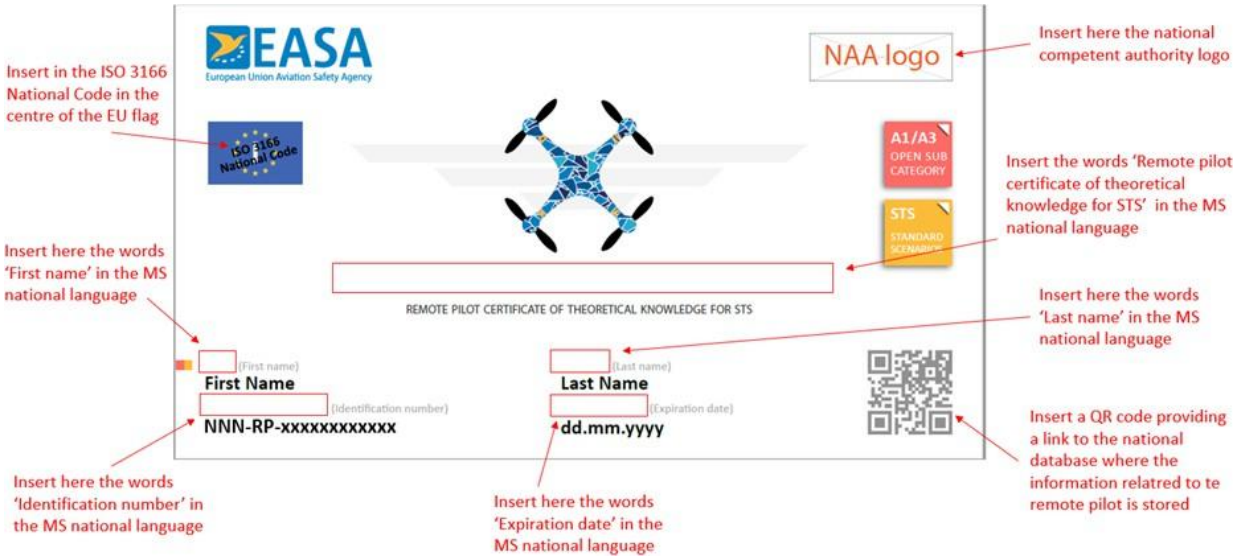
The values for determining the size of the ground risk buffer that are indicated in the table of point MCAR-UAS.STS-01.020(1)(c)(i)(C) should be considered as minimum values. However, additional margins should be considered depending on factors that may increase the distance travelled by the UA, e.g. UA flight characteristics, such as autorotation capability, wind, remote pilot's reaction time, etc.

AMC1 UAS.STS-01.020(1)(e)(i) UAS operations in STS-01 and UAS.STS-02.020(7)(a) UAS operations in STS-02

CERTIFICATE OF REMOTE PILOT THEORETICAL KNOWLEDGE

Upon receipt of proof that the remote pilot has successfully completed the theoretical knowledge examination, the Authority or the entity that is designated by the Authority

should provide the remote pilot with a certificate of remote pilot theoretical knowledge in the format that is depicted in the figure below. The certificate may be provided in electronic form.



The remote pilot identification number that is provided by the Authority, or the entity that is designated by the Authority, which issues the certificate of remote pilot theoretical knowledge should have the following format:

NNN-RP-xxxxxxxxxxxx

Where:

— 'NNN' is the ISO 3166 Alpha-3 code of the Authority that issues the proof of completion;

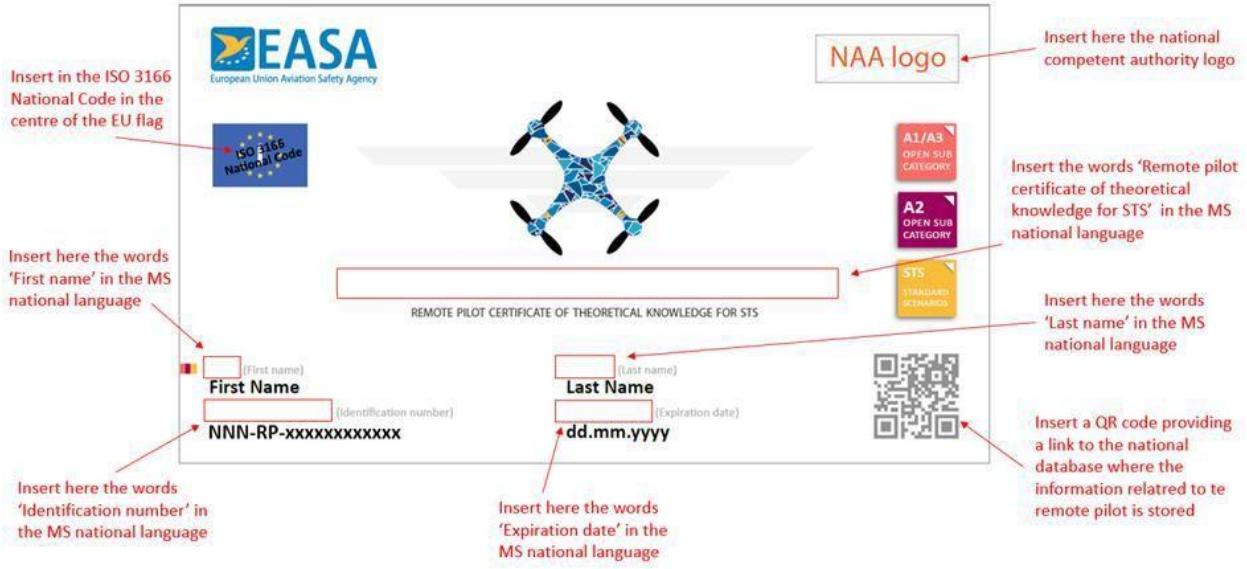
— 'RP' is a fixed field meaning 'remote pilot'; and

— 'xxxxxxxxxxxx' are 12 alphanumeric characters (lower-case only) defined by the Authority that issues the proof of completion.

Example: (FIN-RP-123456789abc)

The QR code provides a link to the national database where the information related to the remote pilot is stored. Through the 'remote pilot identification number', all information related to the training of the remote pilot can be retrieved by authorised bodies (e.g. authorities, law enforcement authorities, etc.) and authorised personnel.

If the remote pilot provides the declaration of the practical-skills self-training as defined in point MCAR-UAS.OPEN.030(2)(c), before passing the theoretical knowledge examination, the Authority may include in the certificate also 'subcategory A2'.



AMC1 UAS.STS-01.020(1)(e)(ii) UAS operations in STS-01 and UAS.STS-02.020(7)(b) UAS operations in STS-02

REMOTE PILOT PRACTICAL TRAINING FOR STSs

The instructor should gradually compile a 'progress booklet' to allow the monitoring of the training and the continuous evaluation of the practical skills of the student remote pilot.

The progress booklet should be signed by the student remote pilot at the end of each practical training cycle. A record of the booklet should be kept for 5 years.

When the student remote pilot reaches the desired level of competence, the organisation that provides the practical training issues an attestation of practical training.

GM1 UAS.STS-01.020(1)(e)(ii) UAS operations in STS-01 and UAS.STS-02.020(7)(b) UAS operations in STS-02

REMOTE PILOT PRACTICAL TRAINING FOR STSs

Practical training for STSs is provided as a 'continuous evaluation' of the student remote pilot by:

(1) either a UAS operator that has declared compliance with:

(a) the relevant STS(s) (the one(s) for which training and assessment are provided); and

(b) the requirements of Appendix 3 of this Subpart to this MCARn; or

(2) an entity that has declared compliance with the requirements of Appendix 3 to this Subpart of this MCAR.

UAS.STS-01.030 Responsibilities of the UAS operator

In addition to the responsibilities defined in MCAR-UAS.SPEC.050, the UAS operator shall:

(1) develop an operations manual including the elements defined in Appendix 5;

(2) define the operational volume and ground risk buffer for the intended operations, including the controlled ground area covering the projections on the surface of the earth within both the volume and the buffer;

(3) ensure the adequacy of the contingency and emergency procedures through any of the following:

(a) dedicated flight tests;

(b) simulations, provided that the representativeness of the simulation means is appropriate for the intended purpose;

(4) develop an effective emergency response plan (ERP) suitable for the operation that includes at least:

(a) the plan to limit any escalating effects of the emergency situation;

(b) the conditions to alert the relevant authorities and organisations;

(c) the criteria to identify an emergency situation;

(d) clear delineation of the duties of the remote pilot(s) and any other personnel in charge of duties essential to the UAS operation;

(5) ensure that the level of performance for any externally provided service necessary for the safety of the flight is adequate for the intended operation;

(6) define the allocation of the roles and responsibilities between the operator and the external service provider(s), if applicable;

(7) upload updated information into the geo-awareness, if the function is installed on the UAS, when required by the UAS geographical zone for the intended location of operation;

(8) ensure that, before starting the operation, the controlled ground area is in place, effective and compliant with the minimum distance defined in point UAS.STS-01.020(1)(C)(i)(C) and, when required, coordination with the appropriate authorities has been conducted;

(9) ensure that, before starting the operation, all persons present in the controlled ground area:

(a) have been informed of the risks of the operation;

(b) have been briefed or trained, as appropriate, on the safety precautions and measures established by the UAS operator for their protection; and

(c) have explicitly agreed to participate in the operation;

(10) ensure that:

(a) the UAS is accompanied by the correspondings declaration(s) of conformity, as defined in Subpart E of this MCAR or the Third Schedule of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 including the reference to class C5 or reference to class C3 and to the accessories kit; and

(b) the class C5 identification label is affixed to the unmanned aircraft or to the accessories kit.

AMC1 UAS.STS-01.030(1)&(3) and UAS.STS-02.030(1)&(3)

OPERATIONAL PROCEDURES

The UAS operator should comply with the conditions for a 'medium' level of robustness of AMC2 UAS.SPEC.030(3)(e) as regards:

— the operational procedures contained in the OM, indicated in MCAR-UAS.STS-01.030(1) and MCAR-UAS.STS-02.030(1); and

— the contingency and emergency procedures, indicated in MCAR-UAS.STS-01.030(3) and MCAR-UAS.STS-02.030(3).

The flight test to verify the adequacy of the contingency and emergency procedures may be conducted in subcategory A3 of the 'open' category. In that case, the UAS operator should ensure that the UAS operation complies with the 'open' category requirements.

AMC1 UAS.STS-01.030(4) and UAS.STS-02.030(4) Responsibilities of

EMERGENCY RESPONSE PLAN (ERP)

The UAS operator should develop an ERP in compliance with the conditions for a 'medium' level of robustness as per AMC3 MCAR-UAS.SPEC.030(3)(e).

GM1 UAS.STS-01.030(5)&(6) and UAS.STS-02.030(5)&(6) Responsibilities of the UAS operator

EXTERNALLY PROVIDED SERVICES

'External service' should be understood as any service that is provided by an external service provider to the UAS operator and which is:

— necessary to ensure the safety of a UAS operation; and

— provided by a service provider other than the UAS operator.

UAS.STS-01.040 Responsibilities of the remote pilot

In addition to the responsibilities defined in MCAR-UAS.SPEC.060, the remote pilot:

(1) before starting an UAS operation, shall verify that the means to terminate the flight of the unmanned aircraft are operational and check if the direct remote identification is active and up-to-date;

(2) during the flight:

(a) shall keep the unmanned aircraft in VLOS and maintain a thorough airspace scan of the airspace surrounding the unmanned aircraft in order to avoid any risk of a collision with any manned aircraft. The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property;

(b) for the purposes of point (a), may be assisted by an unmanned aircraft observer. In such case, clear and effective communication shall be established between the remote pilot and the unmanned aircraft observer;

(c) shall have the ability to maintain control of the unmanned aircraft, except in the case of a lost command and control (C2) link;

(d) shall operate only one unmanned aircraft at a time;

(e) shall not operate the unmanned aircraft from a moving vehicle;

(f) shall not hand over the control of the unmanned aircraft to another command unit;

(g) shall perform the contingency procedures defined by the UAS operator for abnormal situations, including when the remote pilot has an indication that the unmanned aircraft may exceed the limits of the flight geography; and

(h) shall perform the emergency procedures defined by the UAS operator for emergency situations, including triggering the means to terminate the flight when the remote pilot has an indication that the unmanned aircraft may exceed the limits of the operational volume.

ATTACHMENT A: REMOTE PILOT THEORETICAL KNOWLEDGE AND PRACTICAL SKILL EXAMINATION FOR STS-01

(1) Theoretical knowledge examination

(a) The examination referred in point (2)(b) of point MCAR-UAS.STS-01.020 shall comprise at least 40 multiple-choice questions aimed at assessing the remote pilot's knowledge of the technical and operational mitigations, distributed appropriately across the following subjects:

(i) aviation regulations;

(ii) human performance limitations;

(iii) operational procedures;

(iv) technical and operational mitigations for ground risk;

(v) UAS general knowledge;

(vi) meteorology;

(vii) the flight performance of the UAS; and

(viii) technical and operational mitigations for air risks.

(b) If the student remote pilot already holds a certificate of remote pilot competency as referred to in point (2) of point MCAR-UAS.OPEN.030, the examination shall comprise at least 30 multiple-choice questions distributed appropriately across the subjects in points (1)(a)(i) to (1)(a)(v).

(c) To pass the theoretical knowledge examination, the remote pilot student shall achieve at least 75 % of the overall marks.

(2) Practical skill training and assessment

The training and assessment of the practical skill for operations under any standard scenario shall cover at least the subjects and areas identified in Table 2:

Table 2 - Subjects and areas to be covered for practical skill training and assessment

Subject	**Areas to be covered**
(a) Pre-flight actions	(i) Operation planning, airspace considerations and site risk assessment. The following points are to be included: (A) identify the objectives of the intended operation; (B) make sure that the defined operational volume and relevant buffers (e.g. ground risk buffer) are suitable for the intended operation; (C) spot the obstacles in the operational volume that could hinder the intended operation; (D) identify whether the wind speed and/or direction may be affected by topography or by obstacles in the operational volume; (E) select relevant data on airspace information (including on UAS geographical zones) that can have an impact on the intended operation; (F) make sure the UAS is suitable for the intended operation; (G) make sure that the selected payload is compatible with the UAS used for the operation; (H) implement the necessary measures to comply with the limitations and conditions applicable to the operational volume and ground risk buffer for the intended operation in accordance with the operations manual procedures for the relevant scenario;

	(K) brief all participants about the planned operation. (ii) UAS pre-flight inspection and set-up (including flight modes and power-source hazards). The following points are to be included: (A) assess the general condition of the UAS; (B) ensure that all the removable components of the UAS are properly secured; (C) make sure that the UAS software configurations are compatible; (D) calibrate the instruments in the UAS; (E) identify any flaw that may jeopardise the intended operation; (F) make sure that the energy level of the battery is sufficient for the intended operation; (G) make sure that the flight termination system of the UAS and its triggering system are operational; (H) check the correct functioning of the command and control link; (I) activate the geo-awareness function and upload the information to it (if geo-awareness function is available); and (J) set the height and speed limitation systems (if available). (iii) Knowledge of the basic actions to be taken in the event of an emergency situation, including issues with the UAS, or if a mid-air collision hazard arises during the flight.

(b) In-flight procedures	(i) Maintain an effective look-out and keep the unmanned aircraft within visual line of sight (VLOS) at all times to include: situational awareness of the location in relation to the operational volume and other airspace users, obstacles, terrain and persons who are not involved at all times. (ii) Perform accurate and controlled flight manoeuvres at different heights and distances representative of the corresponding STS (including flight in manual/non-GNSS assisted mode or the equivalent, where fitted). At least the following manoeuvres shall be performed: (A) hover in position (only for rotorcraft); (B) transition from hover into forward flight (only for rotorcraft);

	(F) actions after a failure of a motor/propulsion system; and (G) evasive action (manoeuvres) to avoid collisions. (iii) Real-time monitoring of the UAS status and endurance limitations. **Flight under abnormal conditions:** (A) manage a partial or complete power shortage of the unmanned aircraft propulsion system while ensuring the safety of third parties on the ground; (B) manage the path of the unmanned aircraft in abnormal situations; (C) manage a situation in which the unmanned aircraft positioning equipment is impaired; (D) manage a situation of an incursion by a person not involved into the operational volume or the controlled ground area, and take appropriate measures to maintain safety; (E) react to, and take the appropriate corrective actions for a situations where the unmanned aircraft is likely to exceed the limit of the flight geography (contingency procedures) and from the operational volume (emergency procedures) as defined during the flight preparation; (F) manage the situation when an aircraft approaches the operational volume; and (G) demonstrate the recovery method following a deliberate (simulated) loss of the command and control link.

(c) Post-flight actions	(i) Shut down and secure the UAS. (ii) Post-flight inspection and recording of any relevant data relating to the general condition of the UAS (its systems, components and power sources) and crew fatigue. (iii) Conduct a debriefing about the operation. (iv) Identify situations when an occurrence report was necessary and complete the required occurrence

CHAPTER II

STS-02 – BVLOS WITH AIRSPACE OBSERVERS OVER A CONTROLLED GROUND AREA IN A SPARSELY POPULATED ENVIRONMENT

UAS.STS-02.010 General provisions

(1) During flight, the unmanned aircraft shall be maintained within 120 m from the closest point of the surface of the earth. The measurement of distances shall be adapted according to the geographical characteristics of the terrain, such as plains, hills, mountains.

(2) When flying an unmanned aircraft within a horizontal distance of 50 m from an artificial obstacle taller than 105 m, the maximum height of the UAS operation may be increased up to 15 m above the height of the obstacle at the request of the entity responsible for the obstacle.

(3) The maximum height of the operational volume shall not exceed 30 m above the maximum height allowed in points (1) and (2).

(4) During flight, the unmanned aircraft shall not carry dangerous goods.

UAS.STS-01.010 General provisions

UAS operations in STS-02 shall be conducted:

(1) in accordance with the operations manual referred to in point (1) of point UAS.STS-02.030;

(2) over a controlled ground area entirely located in a sparsely populated environment including:

(a) the flight geography area,

(b) the contingency, which its external limit(s) shall be located at least 10 m beyond the limit(s) of the flight geography area,

(c) a ground risk buffer covering a distance that is at least equal to the distance most likely to be travelled by the UA after activation of the means to terminate the flight specified by the UAS manufacturer in manufacturer's instructions, considering the operational conditions within the limitations specified by the UAS manufacturer;

(3) in an area where the minimum flight visibility is more than 5 km;

(4) with the unmanned aircraft in sight of the remote pilot during the launch and recovery of the unmanned aircraft, unless the latter is the result of an emergency flight termination;

(5) if no airspace observer is used in the operation, with the unmanned aircraft flying no further than 1 km from the remote pilot, with the unmanned aircraft following a pre-programmed trajectory when the unmanned aircraft is not in VLOS of the remote pilot;

(6) if one or more airspace observers are used in the operation, it shall comply with all of the following conditions:

(a) the airspace observer(s) are positioned in a manner allowing for an adequate coverage of the operational volume and the surrounding airspace with the minimum flight visibility indicated in point (3);

(b) the unmanned aircraft is operated no further than 2 km from the remote pilot;

(c) the unmanned aircraft is operated no further than 1 km from the airspace observer who is nearest to the unmanned aircraft;

(d) the distance between any airspace observer and the remote pilot is not more than 1 km;

(e) robust and effective communication means are available for the communication between the remote pilot and the airspace observer(s);

(7) by a remote pilot who holds:

(a) a certificate of remote pilot theoretical knowledge for operations in standard scenarios, issued by the Authority or by an entity designated by the Authority of a Contracting State;

(b) an accreditation of completion of the STS-02 practical skill training, in accordance with Attachment A to this Chapter and issued by:

(A) an entity that has declared compliance with the requirements in Appendix 3 and is recognised by the Authority; or

(B) by an UAS operator that has declared to the Authority of the State of registration, compliance with STS-02 and that has declared compliance with the requirements in Appendix 3;

(8) with an unmanned aircraft which complies with all of the following conditions:

(a) is marked as class C6 and complies with the requirements of that class, as defined in Subpart E of this MCAR;

(b) is operated with an active system to prevent the unmanned aircraft from breaching the flight geography;

(c) is operated with active and updated direct remote identification system.

(9) The remote pilot shall obtain the certificate of theoretical knowledge for operations in the standard scenarios after:

(a) having completed an online training course and passed the online theoretical knowledge examination as referred to in point (4)(b) of point MCAR-UAS.OPEN.020; and

(b) having passed an additional theoretical knowledge examination provided by the Authority or by an entity designated by the Authority or designated by a Contracting State in accordance with Attachment A to this Chapter.

(10) This certificate shall be valid for five years. The revalidation, within its validity period is subject to any of the following:

(a) the demonstration of competencies in accordance with point (9);

(b) the completion of a refresher training addressing the theoretical knowledge subjects as defined in point (9) provided by the Authority or by an entity designated by the Authority; or designated by a Contracting State

(11) In order to revalidate the certificate upon its expiration, the remote pilot shall comply with point (9).

GM1 UAS.STS-01.030(5)&(6) and UAS.STS-02.030(5)&(6) Responsibilities of the UAS operator

FLIGHT VISIBILITY

Point MCAR-UAS.STS-02.020(3) requires a minimum flight visibility of 5 km to ensure that the remote pilot and/or the AO(s) can adequately visually scan the operational volume and surrounding airspace to detect well in advance any incoming manned aircraft and identify any risk of collision with that aircraft.

'Flight visibility' should be understood as the shortest distance from the remote pilot's position, or from the position of each of the AOs (if employed), at which unlighted objects may be seen and identified at day and prominently lighted objects may be seen and identified at night. It should be considered in all directions.

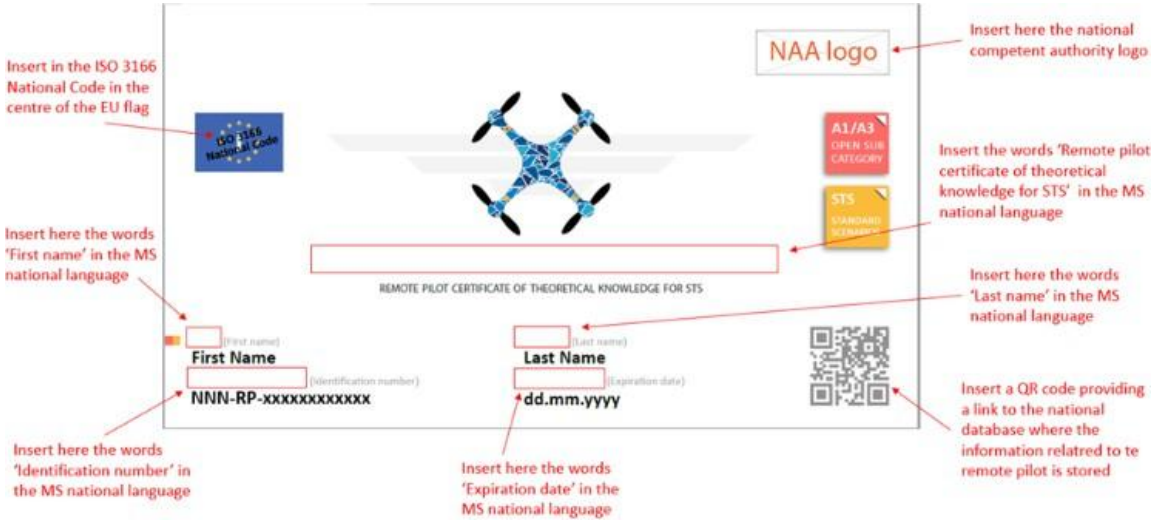
Before starting the intended UAS operation, the UAS operator should gather all relevant information that may affect the UAS flight visibility.

Other aspects that should be considered are, for example, the light conditions (including the sun or other intense lights that may blind the remote pilot and/or the AO(s)), the presence of natural or artificial obstacles, the cloud ceiling level, the presence of smoke, etc.

AMC1 UAS.STS-01.030(4) and UAS.STS-02.030(4) Responsibilities of the UAS operator

CERTIFICATE OF REMOTE PILOT THEORETICAL KNOWLEDGE

Upon receipt of proof that the remote pilot has successfully completed the theoretical knowledge examination, the Authority or the entity that is designated by the Authority should provide the remote pilot with a certificate of remote pilot theoretical knowledge in the format that is depicted in the figure below. The certificate may be provided in electronic form.



The remote pilot identification number that is provided by the Authority, or the entity that is designated by the Authority or designated by a Contracting State, which issues the certificate of remote pilot theoretical knowledge should have the following format:

NNN-RP-xxxxxxxxxxxx

Where:

— ‘NNN’ is the ISO 3166 Alpha-3 code of the Authority that issues the proof of completion;

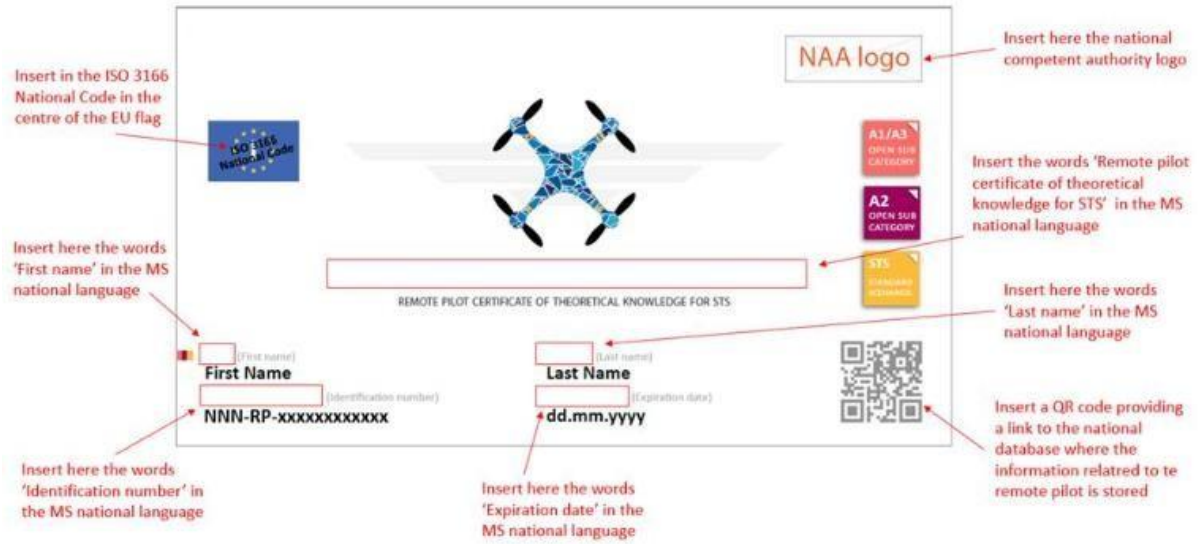
— ‘RP’ is a fixed field meaning ‘remote pilot’; and

— ‘xxxxxxxxxxxx’ are 12 alphanumeric characters (lower-case only) defined by the Authority that issues the proof of completion.

Example: (FIN-RP-123456789abc)

The QR code provides a link to the national database where the information related to the remote pilot is stored. Through the ‘remote pilot identification number’, all information related to the training of the remote pilot can be retrieved by authorised bodies (e.g. competent authorities, law enforcement authorities, etc.) and authorised personnel.

If the remote pilot provides the declaration of the practical-skills self-training as defined in point MCAR-UAS.OPEN.030(2)(c), before passing the theoretical knowledge examination, the Authority may include in the certificate also ‘subcategory A2’.



AMC1 UAS.STS-01.020(1)(e)(ii) UAS operations in STS-01 and

REMOTE PILOT PRACTICAL TRAINING FOR STSs

The instructor should gradually compile a 'progress booklet' to allow the monitoring of the training and the continuous evaluation of the practical skills of the student remote pilot.

The progress booklet should be signed by the student remote pilot at the end of each practical training cycle. A record of the booklet should be kept for 5 years.

When the student remote pilot reaches the desired level of competence, the organisation that provides the practical training issues an attestation of practical training.

GM1 UAS.STS-01.020(1)(e)(ii) UAS operations in STS-01 and UAS.STS-02.020(7)(b) UAS operations in STS-02

REMOTE PILOT PRACTICAL TRAINING FOR STSs

Practical training for STSs is provided as a 'continuous evaluation' of the student remote pilot by:

(1) either a UAS operator that has declared compliance with:

(a) the relevant STS(s) (the one(s) for which training and assessment are provided); and

(b) the requirements of Appendix 3 to the Annex to the UAS Regulation; or

(2) an entity that has declared compliance with the requirements of Appendix 3 to the Annex to the UAS Regulation.

UAS.STS-02.030 Responsibilities of the UAS operator

In addition to the responsibilities defined in MCAR-UAS.SPEC.050, the UAS operator shall:

(1) develop an operations manual including the elements defined in Appendix 5;

(2) define the operational volume and ground risk buffer for the intended operations, including the controlled ground area covering the projections on the surface of the earth of both the volume and the buffer;

(3) ensure the adequacy of the contingency and emergency procedures through any of the following:

(a) dedicated flight tests;

(b) simulations, provided that the representativeness of the simulation means is appropriate for the intended purpose;

(4) develop an effective emergency response plan (ERP) suitable for the operation that includes at least:

(a) the plan to limit the escalating effects of the emergency situation;

(b) the conditions to alert the relevant authorities and organisations;

(c) the criteria to identify an emergency situation;

(d) clear delineation of the duties of the remote pilot(s) and any other personnel in charge of duties essential to the UAS operation;

(5) ensure that the level of performance for any externally provided service necessary for the safetyof the flight is adequate for the intended operation;

(6) define the allocation of the roles and responsibilities between the operator and the external service provider(s), if applicable;

(7) upload updated information into the geo-awareness, if the function is installed on the UAS, when required by the UAS geographical zone for the intended location of the operation;

(8) ensure that, before starting the operation, all appropriate measures to reduce the risk of intrusion of uninvolved persons in the controlled ground area compliant with the minimum distance defined in point MCAR-UAS.STS-02.020(2) have been taken and, when required, coordination with the appropriate authorities has been conducted;

(9) ensure that, before starting the operation, all persons present in the controlled ground area:

(a) have been informed of the risks of the operation;

(b) have been briefed and, if applicable, trained on the safety precautions and measures established by the UAS operator for their protection; and

(c) have explicitly agreed to participate in the operation;

(10) before starting the operation, if airspace observers are used:

(a) ensure the correct placement and number of airspace observers along the intended flight path;

(b) verify:

(i) that the visibility and the planned distance of the airspace observer are within acceptable limits as defined in the operations manual;

(ii) the absence of potential terrain obstructions for each airspace observer;

(iii) that there are no gaps between the zones covered by each of the airspace observers;

(iv) that the communication with each airspace observer is established and effective;

(v) that if means are used by the airspace observers to determine the position of the unmanned aircraft, those means are functioning and effective;

(c) ensure that the airspace observers have been briefed on the intended path of the unmanned aircraft and the associated timing;

(11) ensure that:

(a) the UAS is accompanied by the corresponding EU declaration of conformity, including the reference to class C6;

(b) the class C6 identification label is affixed to the unmanned aircraft.

AMC1 UAS.STS-01.030(1)&(3) and UAS.STS-02.030(1)&(3) Responsibilities of the UAS operator

OPERATIONAL PROCEDURES

The UAS operator should comply with the conditions for a 'medium' level of robustness of AMC2 MCAR-UAS.SPEC.030(3)(e) as regards:

— the operational procedures contained in the OM, indicated in MCAR-UAS.STS-01.030(1) and MCAR-UAS.STS-02.030(1); and

— the contingency and emergency procedures, indicated in MCAR-UAS.STS-01.030(3) and MCAR-UAS.STS-02.030(3).

The flight test to verify the adequacy of the contingency and emergency procedures may be conducted in subcategory A3 of the 'open' category. In that case, the UAS operator should ensure that the UAS operation complies with the 'open' category requirements.

AMC1 UAS.STS-01.030(4) and UAS.STS-02.030(4) Responsibilities of the UAS operator

EMERGENCY RESPONSE PLAN (ERP)

The UAS operator should develop an ERP in compliance with the conditions for a 'medium' level of robustness as per AMC3 MCAR-UAS.SPEC.030(3)(e).

GM1 UAS.STS-01.030(5)&(6) and UAS.STS-02.030(5)&(6) Responsibilities of the UAS operator

EXTERNALLY PROVIDED SERVICES

External service' should be understood as any service that is provided by an external service provider to the UAS operator and which is:

— necessary to ensure the safety of a UAS operation; and

— provided by a service provider other than the UAS operator.

UAS.STS-02.040 Responsibilities of the remote pilot

In addition to the responsibilities defined in MCAR-UAS.SPEC.060, the remote pilot shall:

(1) before starting an UAS operation:

(i) set the programmable flight volume of the unmanned aircraft to keep it within the flight geography;

(ii) verify that the means to terminate the flight and the programmable operational volume functionality of the unmanned aircraft are operational; and, check if the direct remote identification is active and up-to-date.

(2) during flight:

(i) unless supported by airspace observers, maintain a thorough airspace scan of the airspace surrounding the unmanned aircraft in order to avoid any risk of a collision with any manned aircraft. The remote pilot shall discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property;

(ii) have the ability to maintain control of the unmanned aircraft, except in the case of a lost command and control (C2) link;

(iii) operate only one unmanned aircraft at a time;

(iv) not operate the unmanned aircraft from a moving vehicle;

(v) shall not hand over the control of the unmanned aircraft to another CMU;

(vi) inform the airspace observer(s), when employed, in a timely manner of any deviations of the unmanned aircraft from the intended path, and the associated timing;

(vii) perform the contingency procedures defined by the UAS operator for abnormal situations, including when the remote pilot has indication that the unmanned aircraft may exceed the limits of the flight geography;

(viii) perform the emergency procedures defined by the UAS operator for emergency situations, including triggering the means to terminate the flight when the remote pilot has an indication that the unmanned aircraft may exceed the limits of the operational volume.

UAS.STS-02.050 Responsibilities of the airspace observer

An airspace observer shall:

(1) maintain a thorough airspace scan of the airspace surrounding the unmanned aircraft in order to identify any risk of a collision with any manned aircraft;

(2) maintain awareness of the position of the unmanned aircraft through direct airspace observation or through assistance provided by electronic means;

(3) alert the remote pilot when a hazard is detected and assist in avoiding or minimising the potential negative effects.

AMC1 UAS.STS-02.050(2) Responsibilities of the airspace observer

MAINTAINING AWARENESS OF THE UA

The airspace observer should be provided with clear and concise information on the geographical position of the UA, its speed, and its height above the surface or take-off point.

The airspace observer may use the same system provided to the remote pilot to comply with the requirement in Subpart E of this MCAR.

ATTACHMENT A: REMOTE PILOT THEORETICAL KNOWLEDGE AND PRACTICAL SKILL FOR STS-02

(1) Theoretical knowledge examination

The examination shall be defined in accordance with point 1 of Attachment A to Chapter I.

(2) Practical skill training and assessment

In addition to the areas defined in point A.2 of Attachment A to Chapter I, the following areas shall be covered:

Table 3 - Additional subjects and areas to be covered for practical skill training and assessment for STS-02

(a) BVLOS operations conducted under STS-02	(i) Pre-flight actions — operation planning, airspace Considerations and site risk-assessment. The following points are to be included: (A) airspace scanning;

Appendix 2 — Operational declaration

Data protection: Personal data included in this declaration is processed by the Authority pursuant to the Data Protection Act on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. It will be processed for the purposes of the performance, management and follow up of the oversight activities according to the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

If you require further information concerning the processing of your personal data or you wish to exercise your rights (e.g. to access or rectify any inaccurate or incomplete data), please refer to the contact point of the Authority.

UAS operator registration number	
UAS operator name	
UAS manufacturer	
UAS model	

DEPARTMENT OF CIVIL AVIATION

MCAR-UAS

UAS Serial number	

I hereby declare that:

I comply with all the applicable provisions of Implementing Regulation (EU) 2019/947 and with STS.x; and

Date		**Signature or other verification**	

GM1 Appendix 2 Operational declaration

OPERATIONAL DECLARATION FORM: UAS MANUFACTURER, UAS MODEL AND UAS SERIAL NUMBER

If the UAS operator intends to conduct UAS operations that are covered by the STS that uses different UASs (not used at the same time in the same location and all bearing the appropriate class identification label), the UAS operator is not required to submit a separate operational declaration form for each UAS.

In such a case, the information on the 'UAS manufacturer', the 'UAS model', and the 'UAS serial number' for each UAS should be provided in the corresponding fields of the operational declaration form. For example, for two different UASs from different manufacturers:

	UAS manufacturer	UAS model	UAS serial number
UAS #1			
UAS #2			

If the UAS operator intends to provide practical-skills training and conduct practical-skills assessments of remote pilots that operate in an STS, information on the manufacturer, the model, and the serial number of the UAS that is used for such training and assessment should also be included in the operational declaration form even if the UAS is used only for training and assessment purposes.

Appendix 3 — Additional requirements for entities recognised by the Authority and UAS operators that conduct practical skill training and assessment of remote pilots for operations

An entity that intends to be recognised by the Authority for conducting practical skill training and assessment of remote pilots for an STS, shall declare to the Authority compliance with the following requirements using the declaration form in Appendix 6.

An UAS operator that intends to conduct practical skill training and assessment of remote pilots for an STS, in addition to submitting the operational declaration for that STS, shall declare to the Authority compliance with the following requirements using the declaration form in Appendix 4.

If the Authority or the UAS operator intends to conduct practical skill training and assessment of remote pilots for an STS in Mauritius other than the State of registration, a copy of the declaration form in Appendix 4 shall be submitted to the Authority of the State where the training is conducted.

If an entity recognised by the Authority intends to conduct practical skill training and assessment of remote pilots for an STS in Mauritius other than the State of recognition, a proof of the recognition shall be submitted to the Authority of the State where the training is conducted.

(1) The entity recognised by the Authority or the UAS operator shall ensure a clear separation between the training activities and any other operational activity to guarantee the independence of the evaluation.

(2) The entity recognised by the Authority or the UAS operator shall have the capability to adequately perform the technical and administrative activities linked with the entire task process, including the adequacy of personnel and the use of facilities and equipment appropriate to the task.

(3) The entity recognised by the Authority or the UAS operator shall have an accountable manager, with the responsibility for ensuring that all tasks are performed in compliance with the information and procedures identified in point (8).

(4) The personnel responsible for the practical skill training and practical skill assessment tasks shall:

(a) have the competence to conduct these tasks;

(b) be impartial and shall not participate in assessments if they feel that their objectivity may be affected;

(c) have a sound theoretical knowledge and practical skill training experience, and satisfactory knowledge of the requirements for the practical skill assessment tasks they carry out as well as adequate experience of such processes;

(d) have the ability to administer the declarations, records and reports that demonstrate that the relevant practical skill assessments have been carried out and to draw the conclusions of those practical skill assessments; and

(e) not disclose any information supplied by the operator or remote pilot to any person other than the Authority upon their request.

(5) The training and assessment shall cover the practical skills corresponding to the STS for which the declaration is made, included in Attachment A to the relevant Chapter.

(6) The practical skill training and assessment location(s) shall be conducted in an environment representative of the conditions of the STS.

(7) The practical skill assessment shall consist of a continuous evaluation of the student remote pilot.

(8) The entity recognised by the Authority or the UAS operator shall produce an assessment report after completing the practical skill assessment, which shall:

(a) include at least:

(i) the student remote pilot's identification details;

(ii) the identity of the person responsible for the practical skill assessment;

(iii) the identification of the STS for which the practical skill assessment has been performed;

(iv) performance marks for each action performed by the student remote pilot;

(v) an overall practical skill assessment of the student remote pilot's competencies; and

(vi) practical skill assessment feedback providing guidance on areas for improvement where applicable;

(b) be appropriately signed and dated by the person responsible for the practical skill assessment once complete; and

(c) be recorded and made available for inspection by the Authority upon request.

(9) An accreditation of completion of the practical skill training for the STS shall be delivered to the student remote pilot by entity recognised by the Authority or the UAS operator if the assessment report concludes that the student remote pilot has achieved a satisfactory level of practical skill.

(10) The issuance of the accreditation of completion of point (9) shall be notified to the Authority where the practical skill training and assessment are conducted including the student remote pilot's identification details, the STS covered, the date of issuance and the identification details of the entity recognised by the Authority or the UAS operator issuing it.

(11) The entity recognised by the Authority or the UAS operator shall include in the operations manual, developed in accordance with Appendix 5, a separate section covering the training elements, including the following:

(a) the nominated personnel conducting practical skill training and assessment, including:

(i) descriptions of the respective personnel's competence;

(ii) the personnel's duties and responsibilities; and

(iii) a chart of the organisation showing the associated chains of responsibility;

(b) the procedures and processes used for practical skill training and assessment, including the training syllabus covering the practical skill corresponding to the STS for which the declaration is made, defined in Attachment A to the relevant Chapter;

(c) a description of the UAS and any other equipment, tools and environment used for the practical skill training and assessment; and

(d) a template for the assessment report.

Appendix 4 — Declaration of UAS operators that intend to provide practical skill training and assessment of remote pilots in STS-x

	STS-x
	Declaration of UAS operators that intend to provide practical skill training and assessment of remote pilots

Data protection: Personal data included in this declaration is processed by the Authority pursuant to the Data Protection Act on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, It will be processed for the purposes of the performance, management and follow up of the oversight activities according to the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

If you require further information concerning the processing of your personal data or you wish to exercise your rights (e.g. to access or rectify any inaccurate or incomplete data), please refer to the contact point of the Authority.

UAS operator registration number	

UAS operator name	

I hereby declare that:

I have submitted the operational declaration for STS-x; I comply with the requirements defined in Appendix 3 to this MCAR; and when operating an UAS in the context of training activities for STS.x, I comply with all the applicable provisions of this MCAR including requirements for operations under STS.x

Date		**Signature or other verification**	

Appendix 5 — Operations manual for Standard Scenario

The operations manual for STS defined in Appendix 1 shall contain at least the following:

(1) a statement that the operations manual complies with the relevant requirements of this Regulation and with the declaration, and contains instructions that are to be complied with by the personnel involved in flight operations;

(2) an approval signature by the accountable manager or the UAS operator in the case of a natural person;

(3) an overall description of the UAS operator's organisation;

(4) a description of the concept of the operation, including at least:

(a) the nature and description of the activities performed in the UAS operations, and the identified associated risks;

(b) the operational environment and geographical area for the intended operations, including:

(i) the characteristics of the area to be overflown in terms of the population density, topography, obstacles, etc.;

(ii) the characteristics of the airspace to be used;

(iii) the environmental conditions including at least the weather and the electromagnetic environment;

(iv) the definition of the operational volume and risk buffers to address the ground and air risks;

(c) the technical means used and their main characteristics, performance and limitations, including the UAS, external systems supporting the UAS operation, facilities, etc.;

(d) the required personnel for conducting operations, including the composition of the team, their roles and responsibilities, selection criteria, initial training and recent experience requirements and/or recurrent training;

(5) the maintenance instructions required to keep the UAS in a safe condition, covering the UAS manufacturer's maintenance instructions and requirements, if applicable;

(6) operational procedures, which shall be based on manufacturer's instructions provided by the UAS manufacturer, and shall include:

(a) consideration of the following to minimise human errors:

(i) a clear distribution and assignment of tasks; and

(ii) an internal checklist to check that staff are performing their assigned tasks adequately;

(b) consideration of the deterioration of external systems supporting the UAS operation;

(c) normal procedures, including at least:

(i) pre-flight preparations and checklists, covering:

(A) the assessment of the operational volume and related buffers (the ground risk buffer, and air risk buffer when applicable), including the terrain and potential obstacles and obstructions that may reduce the ability to keep the unmanned aircraft in visual line of sight or to scan the airspace, the potential overflight of persons who are not involved and potential overflight of critical infrastructure;

(B) the assessment of the surrounding environment and airspace, including the proximity of UAS geographical zones and potential activities by other airspace users;

(C) the environmental conditions suitable for conducting the UAS operation;

(D) the minimum number of personnel in charge of duties essential to the UAS operation who are required to perform the operation, and their responsibilities;

(E) the required communication procedures between the remote pilot(s) and any other personnel in charge of duties essential to the UAS operation and with any external parties, when needed;

(F) compliance with any specific requirements from the relevant authorities in the intended area of operations, including those related to security, privacy, data and environmental protection, and the use of the RF spectrum;

(G) the required risk mitigations in place to ensure the safe conduct of the operation; in particular, for the controlled ground area:

(a) determination of the controlled ground area; and

(b) securing the controlled ground area to prevent third parties from entering the area during the operation, and ensuring coordination with the local authorities, when needed;

(H) the procedures to verify that the UAS is in a suitable condition to safely conduct the intended operation;

(ii) launch and recovery procedures;

(iii) in-flight procedures, including those to ensure that the unmanned aircraft remains within the flight geography;

(iv) post-flight procedures, including the inspections to verify the condition of the UAS;

(v) procedures for the detection of potentially conflicting aircraft by the remote pilot and, when required by the UAS operator, by airspace observer(s) or unmanned aircraft observer(s), as applicable;

(d) contingency procedures, including at least:

(i) procedures to cope with the unmanned aircraft leaving the designated 'flight geography';

(ii) procedures to cope with persons who are not involved entering the controlled ground area;

(iii) procedures to cope with adverse operating conditions;

(iv) procedures to cope with the deterioration of external systems supporting the operation;

(v) if airspace observers are employed, the phraseology to be used;

(vi) conflict avoidance procedures with other airspace users;

(e) emergency procedures to cope with emergency situations, including at least:

(i) procedures to avoid, or at least minimise, harm to third parties in the air or on the ground;

(ii) procedures to cope with the unmanned aircraft leaving the 'operational' volume;

(iii) procedures for the emergency recovery of the unmanned aircraft;

(f) security procedures as referred to in point (1)(a)(ii) and (iii) of point UAS.SPEC.050;

(g) the procedures for the protection of personal data referred to in point (1)(a)(iv) of point UAS.SPEC.050;

(h) the guidelines to minimise nuisance and environmental impact referred to in point (1)(a)(v) of point UAS.SPEC.050;

(i) occurrence reporting procedures;

(j) record-keeping procedures; and

(k) the policy defining how the remote pilot(s) and any other personnel in charge of duties essential to the UAS operation can declare themselves fit to operate before conducting any operation.

Appendix 6 — Declaration of the entity intending to be recognised by the Authority to provide practical skill training and

	STS-x
	Declaration of the entity intending to be recognised by the Authority to provide practical skill training and assessment of remote pilots

Data protection: Personal data included in this declaration is processed by the Authority pursuant to the Data Protection Act on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, It will be processed for the purposes of the performance, management and follow up of the oversight activities according to the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

If you require further information concerning the processing of your personal data or you wish to exercise your rights (e.g. to access or rectify any inaccurate or incomplete data), please refer to the contact point of the Authority.

Identification of the entity	
First and last name, telephone number and email address of the responsible person	

I hereby declare that:

I comply with the requirements defined in Appendix 3 to this MCAR; and when operating an UAS in the context of training activities for STS.x, I comply with all the applicable provisions of to the Civil Aviation (Unmanned Aircraft System) Regulations 2024, including the requirements for operations under STS.x in this MCAR.

Date		**Signature or other verification**	

DEPARTMENT OF CIVIL AVIATION

MCAR-UAS

Chapter III – REQUIREMENTS FOR UAS OPERATED IN THE 'CERTIFIED' THE 'SPECIFIC' CATEGORIES EXCEPT WHEN CONDUCTED UNDER A DECLARATION

Requirements for UAS operated in the 'certified' and 'specific' categories except when conducted under a declaration

1. The design, production and maintenance of UAS that meets any of the following conditions shall be certified:

(a) it has a characteristic dimension of 3 m or more, and is designed to be operated over assemblies of people unless the UA is lighter than air;

(b) it is designed for transporting people;

(c) it is designed for the purpose of transporting dangerous goods and requiring a high level of robustness to mitigate the risks for third parties in case of accident;

(d) it is intended to be used in the 'specific' category of operations defined in Regulation 11 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and the Authority has concluded, in accordance with Subpart D of this MCAR, on the basis of the risk assessment conducted by UAS operator in accordance with Regulation 11 of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, that the risk of the operation cannot be adequately mitigated without the certification of the UAS.

1a Paragraph 1 does not apply to UAS that are specifically designed or modified for research, experimental or scientific purposes, and are likely to be produced in very limited numbers. The operation of such UAS will be subject to a permit to fly in accordance with Civil Aviation Regulation 2007.

2. An UAS that meets the conditions specified in paragraph 1 shall comply with the applicable requirements laid down in this MCAR.

2a UAS certified for reasons other than those specified in paragraph 1 shall comply with the applicable requirements laid down in Regulation (EU) No 748/2012 and in Regulation (EU) 2015/640.

3. Unless it needs to be certified in accordance with paragraph 1, a UAS used in the 'specific' category shall feature the technical capabilities set out in the operational authorisation issued by the Authority or as defined by the Light UAS Operator Certificate (LUC) pursuant to Subpart C of this MCAR.

4. Unless privately built, all UAS not subject to registration according to Article 14 of the Implementing Regulation (EU) 2019/947 shall have a unique serial number compliant with standard ANSI/CTA-2063-A-2019, Small Unmanned Aerial Systems Serial Numbers, 2019.

5. Each UA intended to be operated in the 'specific' category and at a height below 120 meters shall be equipped with a remote identification system that allows:

(a) the upload of the UAS operator registration number required in accordance with Article 14 of Implementing Regulation (EU) 2019/947 and any additional number provided by the registration system. The system shall perform a consistency check verifying the integrity of the full string provided to the UAS operator at the time of registration. In case of inconsistency, the UAS shall emit an error message to the UAS operator;

(b) the periodic transmission of at least the following data, in real time during the whole duration of the flight, in a way that it can be received by existing mobile devices:

(i) the UAS operator registration number and the verification code provided by the Member State during the registration process unless the consistency check defined in point(a) is not passed;

(ii) the unique serial number of the UA compliant with paragraph 4 or, if the UA is privately built, the unique serial number of the add on, as specified in Part 6 of the Annex;

(iii) the time stamp, the geographical position of the UA and its height above the surface or take-off point;

(iv) course measured clockwise from true north and ground speed of the UA;

(v) the geographical position of the remote pilot;

(vi) an indication of the emergency status of the UAS.

(c) to reduce the ability of tampering the functionality of the direct remote identification system.

PART 10 — Contents of the technical documentation

The manufacturer shall establish the technical documentation. The documentation shall make it possible to assess the product's conformity to the applicable requirements.

The technical documentation shall, wherever applicable, contain at least the following elements:

1. a complete description of the product including:

(a) photographs or illustrations showing its external features, markings and internal layout;

(b) the versions of any software or firmware involved in compliance with the requirements set by this Regulation;

(c) manufacturer's and installation instructions;

2. conceptual design and manufacturing drawings and schemes of components, sub-assemblies, circuits and other relevant similar elements;

3. descriptions and explanations necessary for the understanding of those drawings and schemes and the operation of the product;

4. a list of the harmonised standards applied in full or in part, the references of which have been published in the Official Journal of the European Union, and, where those harmonised standards have not been applied, descriptions of the solutions adopted to meet the essential requirements set out in Article 4, including a list of other relevant technical specifications applied. In the event of partly applied harmonised standards, the technical documentation shall specify the parts which have been applied;

5. copy of the EU declaration of conformity;

6. where the conformity assessment module in Part 8 has been applied, copy of the EU-type examination certificate and its annexes as delivered by the notified body involved;

7. results of design calculations made, examinations carried out, and other relevant similar elements;

8. test reports;

9. copies of the documents that the manufacturer has submitted to the notified body if any involved;

10. the supporting evidence for the adequacy of the technical design solution. This supporting evidence shall mention any documents that have been used, in particular where the relevant harmonised standards and/or technical specifications have not been applied in full. The supporting evidence shall include, where necessary, the results of tests carried out by the appropriate laboratory of the manufacturer, or by another testing laboratory on his behalf and under his responsibility;

11. addresses of places of manufacture and storage.

PART 11 — EU declaration of conformity

1. The product (type, batch and serial number).

2. Name and address of the manufacturer or his authorised representative.

3. This declaration of conformity is issued under the sole responsibility of the manufacturer. [in case of a kit of accessories, the manufacturer of the kit may indicate that this certificates relies on the certificate of the UAS which the kit ensures the conversion.]

4. Object of the declaration [identification of the product allowing traceability; it may include a colour image of sufficient resolution where necessary for the identification of the products; in case of a kit of accessories, indicate the type of UAS to which the kit ensures the conversion].

5. The object of the declaration described above is of class … [include for UAS the class number as defined by Parts 1 to 5, 16 and 17 of this Annex; for a kit of accessories, indicate the class into which the UAS is converted].

6. The guaranteed sound power level for this UAS equipment is … dB(A) [for non fixed-wing UAS classes 1 to 3 only]

7. The object of the declaration described above is in conformity with the relevant Union harmonisation legislation:

— [include the reference to this Regulation and the Annex relevant to the class of the product];

— or other Union harmonisation legislation where applicable.

8. References to the relevant harmonised standards used or references to the other technical specifications in relation to which conformity is declared. References must be listed with their identification number and version and, where applicable, date of issue.

9. Where applicable, the notified body … [name, number] … performed … [description of intervention] … and issued the EU-type examination certificate.

10. Where applicable, a description of accessories and components, including software, which allow the unmanned aircraft or unmanned aircraft system to operate as intended and covered by the EU declaration of conformity.

11. Additional information:

Signed for and on behalf of: …

[place and date of issue]:

[name, function] [signature]:

PART 12 — Simplified EU declaration of conformity

The simplified EU declaration of conformity referred to in Article 14(3) shall be provided as follows:

— [Name of manufacturer] hereby declares that the UAS [identification of the UAS: type or serial number] is of class … … [for UAS include the class number of the product as defined in Parts 1 to 5, 16 and 17 of this Annex; for a kit of accessories, indicate the class into which the UAS is converted] and has a guaranteed sound power level of … dB(A) [for non fixed-wing UAS classes 1, 2, 3, 5 and 6 only]

— and in compliance with Regulations … [list all the Regulations that the product complies with].

— The full EU declaration of conformity is accessible at the following website: [website address]

PART 13 — Noise test code

This Part lays down the methods of measurement of airborne noise that shall be used for the determination of the measured A-weighted sound power levels of UA classes 1, 2, 3, 5 and 6.

It lays down the basic noise emission standard and detailed test code for measuring the sound pressure level on a measurement surface enveloping the source and for calculating the sound power level produced by the source.

1. BASIC NOISE EMISSION STANDARD

For the determination of the A-weighted sound power level LWA of UA, the basic noise emission standards EN ISO 3744:2010 will be used subject to the following supplements:

2. INSTALLATION AND MOUNTING CONDITIONS

Test area:

The UA will be maintained above one reflecting (acoustically hard) plane. The UA shall be located at a sufficient distance from any reflecting wall or ceiling or any reflecting object so that the requirements given in Annex A of EN ISO 3744:2010 are satisfied on the measurement surface.

Sound measurement surface and microphone array:

The UA will be completely enclosed in a hemispherical measurement surface as per § 7.2.3 of EN ISO 3744:2010.

The number and position of the microphones is defined by Annex F of EN ISO 3744:2010.

The measurement surface shall have its origin at the point O lying in the ground plane directly below the UA.

3. OPERATING CONDITIONS DURING TEST

The noise tests shall be carried out with the UA's rotors operating at a speed corresponding to the hovering of the UA under MTOM.

If the UA is placed on the market with accessories that can be fitted to it, it will be tested with and without these accessories in all possible UA configurations.

4. CALCULATION OF SURFACE TIME-AVERAGED SOUND PRESSURE LEVEL

The A-weighted surface time-averaged sound pressure level shall be determined at least three times for each UA configuration. If at least two of the determined values do not differ by more than 1 dB, further measurements will not be necessary; otherwise the measurements shall be continued until two values differing by no more than 1 dB are obtained. The surface time-averaged sound pressure level to be used for calculating the sound power level of a UA configuration is the arithmetic mean of the two highest values that do not differ by more than 1 dB.

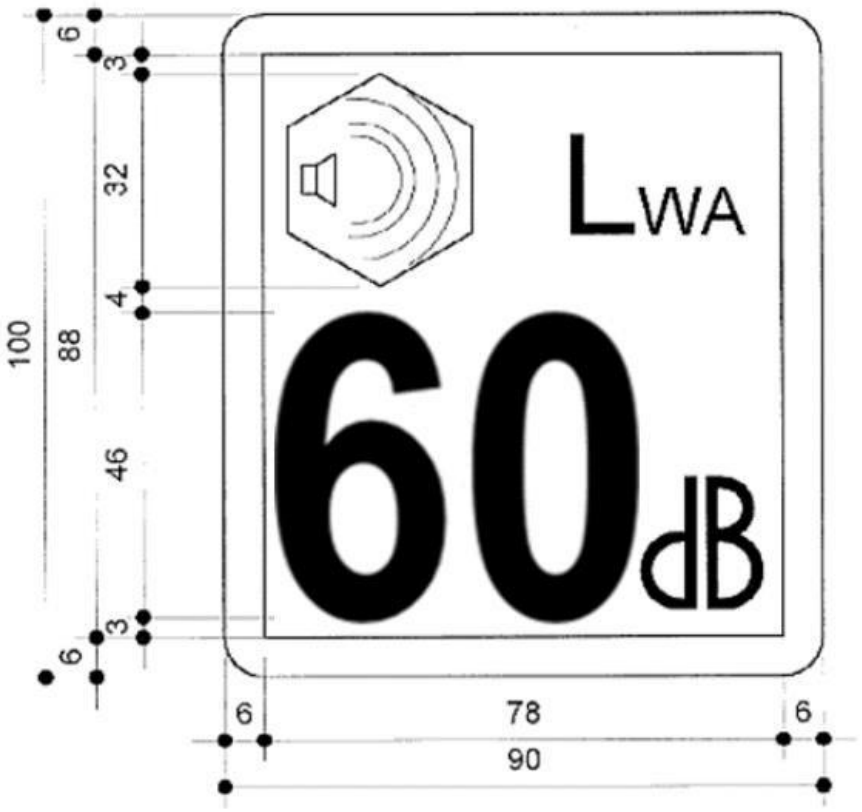
5. INFORMATION TO BE REPORTED

The report shall contain the technical data necessary to identify the source under test as well as the noise test code and the acoustical data.

The A-weighted sound power level value to be reported is the highest value of the different UA configurations tested rounded to the nearest whole number (less than 0,5 use the lower number; greater than or equal to 0,5 use the higher number).

PART 14 — Indication of the guaranteed sound power level

The indication of the guaranteed sound power level must consist of the single number of the guaranteed sound power in dB, the sign LWA and a pictogram taking the following form:



If the indication is reduced according to the size of the equipment the proportions given in the above drawing must be respected. However, the vertical dimension of the indication should, if possible, not be less than 20 mm.

PART 15 — Maximum sound power level per class of UA (including

C2	900 ≤ *m* < 4 000	$85 + 18{,}5 \lg \frac{m}{900}$	$83 + 18{,}5 \lg \frac{m}{900}$	$81 + 18{,}5 \lg \frac{m}{900}$

Where ‘lg’ is the base 10 logarithm.

SUBPART D

Rules for conducting an operational risk assessment

1. An operational risk assessment shall:

   (a) describe the characteristics of the UAS operation;

   (b) propose adequate operational safety objectives;

   (c) identify the risks of the operation on the ground and in the air considering all of the below:

      i. the extent to which third parties or property on the ground could be endangered by the activity;

      ii. the complexity, performance and operational characteristics of the unmanned aircraft involved;

      iii. the purpose of the flight, the type of UAS, the probability of collision with other aircraft and class of airspace used;

      iv. the type, scale, and complexity of the UAS operation or activity, including, where relevant, the size and type of the traffic handled by the responsible organisation or person;

      v. the extent to which the persons affected by the risks involved in the UAS operation are able to assess and exercise control over those risks.

   (d) identify a range of possible risk mitigating measures;

   (e) determine the necessary level of robustness of the selected mitigating measures in such a way that the operation can be conducted safely.

2. The description of the UAS operation shall include at least the following:

   (a) the nature of the activities performed;

   (b) the operational environment and geographical area for the intended operation, in particular overflown population, orography, types of airspace, airspace volume where the operation will take place and which airspace volume is kept as necessary risk buffers, including the operational requirements for geographical zones;

(c) the complexity of the operation, in particular which planning and execution, personnel competencies, experience and composition, required technical means are planned to conduct the operation;

(d) the technical features of the UAS, including its performance in view of the conditions of the planned operation and, where applicable, its registration number;

(e) the competence of the personnel for conducting the operation including their composition, role, responsibilities, training and recent experience.

3. The assessment shall propose a target level of safety, which shall be equivalent to the safety level in manned aviation, in view of the specific characteristics of UAS operation.

4. The identification of the risks shall include the determination of all of the below:

(a) the unmitigated ground risk of the operation taking into account the type of operation and the conditions under which the operation takes place, including at least the following criteria:

i. VLOS or BVLOS;

ii. population density of the overflown areas;

iii. flying over an assembly of people;

iv. the dimension characteristics of the unmanned aircraft;

(b) the unmitigated air risk of the operation taking into account all of the below:

i. the exact airspace volume where the operation will take place, extended by a volume of airspace necessary for contingency procedures;

ii. the class of the airspace; iii. the impact on other air traffic and air traffic management (ATM) and in particular:

— the altitude of the operation;

— controlled versus uncontrolled airspace;

— aerodrome versus non-aerodrome environment;

— airspace over urban versus rural environment;

— separation from other traffic.

5. The identification of the possible mitigation measures necessary to meet the proposed target level of safety shall consider the following possibilities:

(a) containment measures for people on the ground;

(b) strategic operational limitations to the UAS operation, in particular:

i. restricting the geographical volumes where the operation takes place;

ii. restricting the duration or schedule of the time slot in which the operation takes place;

(c) strategic mitigation by common flight rules or common airspace structure and services;

(d) capability to cope with possible adverse operating conditions;

(e) organisation factors such as operational and maintenance procedures elaborated by the UAS operator and maintenance procedures compliant with the manufacturer's user manual;

(f) the level of competency and expertise of the personnel involved in the safety of the flight;

(g) the risk of human error in the application of the operational procedures;

(h) the design features and performance of the UAS in particular:

i. the availability of means to mitigate risks of collision;

ii. the availability of systems limiting the energy at impact or the frangibility of the unmanned aircraft;

iii. the design of the UAS to recognised standards and the fail-safe design.

6. The robustness of the proposed mitigating measures shall be assessed in order to determine whether they are commensurate with the safety objectives and risks of the intended operation, particularly to make sure that every stage of the operation is safe.

GM1 AMC1 - Rules for conducting an operational risk assessment

GENERAL

The operational risk assessment required by this Subpart and may be conducted using the methodology described in AMC1 of this Subpart. This methodology is basically the specific operations risk assessment (SORA) developed by JARUS. Other methodologies might be used by the UAS operator as alternative means of compliance.

Aspects other than safety, such as security, privacy, environmental protection, the use of the radio frequency (RF) spectrum, etc., should be assessed in accordance with the applicable requirements established by the Authority in which the operation is intended to take place,

For some UAS operations that are classified as being in the 'specific' category, alternatives to carrying out a full risk assessment are offered to UAS operators:

(a) for UAS operations with lower intrinsic risks, a declaration may be submitted when the operations comply with the standard scenarios (STSs) listed in Appendix 1 to this MCAR. Table 1 provides a summary of the STSs; and

(b) for other UAS operations, a request for authorisation may be submitted based on the mitigations and provisions described in the predefined risk assessment (PDRA) when the UAS operation meets the operational characterisation described in AMC2 et seq. this Subpart. Table 2 below provides a summary of the PDRAs that have been published so far.

While the STSs are described in a detailed way, the provisions and mitigations in the PDRAs are described in a rather generic way to provide flexibility to UAS operators and the competent authorities to establish more prescriptive limitations and provisions that are adapted to the particularities of the intended operations. Two types of PDRAs are provided:

— those derived from an STS, which allow the UAS operator to conduct similar operations, but using, for example, UAS without the class label that is mandated by the STS (e.g. privately built UAS); and

— more generic PDRAs.

The codification of a PDRA includes the letter 'G' or 'S' (e.g. PDRA-G01 or PDRA-S01):

— 'G' is used for generic PDRAs.

— 'S' is used for PDRAs that are derived from an STS whose level of prescriptiveness is the same as of the corresponding STS. Therefore, those PDRAs, although they address UAS operations that are subject to operational authorisations (to allow the use of UAS without a class label), are expected to provide an even more simplified authorisation process compared to other (non-STS-related) PDRAs. Ideally, for UAS operations that are performed based on those PDRAs, the competent authorities may implement expedited operational-authorisation processes. Those processes may be based on the review of the documentation that is submitted by the UAS operator to support the declaration of compliance with the PDRA provisions.

In accordance with this Subpart, the applicant must collect and provide the relevant technical, operational and system information needed to assess the risk associated with the intended operation of the UAS, and the SORA (AMC1 of this Subpart provides

a detailed framework for such data collection and presentation. The concept of operations (ConOps) description is the foundation for all other activities, and should be as accurate and detailed as possible. The ConOps should not only describe the operation, but also provide insight into the UAS operator's operational safety culture. It should also include how and when to interact with the air navigation service provider (ANSP) when applicable.

PDRAs only address safety risks; consequently, additional limitations and provisions might need to be included after the consideration of other risks (e.g. security, privacy, etc.).

STS#	Edition/date	UAS characteristics	BVLOS/VLOS	Overflown area	Maximum range from remote pilot	Maximum height	Airspace	Notes
STS-01	June 2020	Bearing a C5 class marking (maximum characteristic dimension of up to 3 m and MTOM of up to 25 kg)	VLOS	Controlled ground area that might be located in a populated area	VLOS	120 m	Controlled or uncontrolled, with low risk of encounter with manned aircraft	
STS-02	June 2020	Bearing a C6 class marking (maximum characteristic dimension of up to 3 m and MTOM of up to 25 kg)	BVLOS	Controlled ground area that is entirely located in a sparsely populated area	2 km with an AO 1 km, if no AO	120 m	Controlled or uncontrolled, with low risk of encounter with manned aircraft	

When UAS operators intend to conduct an operation covered by a PDRA, they should fill in the last two columns of the table related to the selected PDRA, named ‘integrity’ and ‘proof’. In the column ‘integrity’ they should explain how the level of integrity is met, and in the column ‘proof’ how the level of integrity is demonstrated. To support UAS operators, the two columns are already prefilled; however, the UAS operator may adapt the text to their needs.

If the UAS operation does not fit completely within the limits of the PDRA, the UAS operator is required to conduct a full risk assessment and submit it to the Authority. Changes to the PDRA should not be done, unless the Authority accepts that minor changes should be made.

PDRA#	Edition/date	UAS characteristics	BVLOS/VLOS	Overflown area	Maximum range from remote pilot	Maximum height	Airspace	AMC# to Article 11	Notes
PDRA-S01	1.1 / January 2022	Maximum characteristic dimension of up to 3 m and take-off mass of up to 25 kg	VLOS	Controlled ground area that might be located in a populated area	VLOS	150 m	Controlled or uncontrolled, with low risk of encounter with manned aircraft	AMC4	
PDRA-S02	1.1 / January 2022	Maximum characteristic dimension of up to 3 m and take-off mass of up to 25 kg	BVLOS	Controlled ground area that is entirely located in a sparsely populated area	2 km with an AO or with AOs 1 km, if no AO	150 m	Controlled or uncontrolled, with low risk of encounter with manned aircraft	AMC5	
PDRAG01	1.2 / January 2022	Maximum characteristic dimension of up to 3 m and typical kinetic energy of up to 34 kJ	BVLOS	Sparsely populated area	If no AO, up to 1 km	150 m (operational volume)	Uncontrolled, with low risk of encounter with manned aircraft	AMC2	
PDRAG02	1.1 / January 2022	Maximum characteristic dimension of up to 3 m and typical kinetic energy of up to 34 kJ	BVLOS	Sparsely populated area	n/a (direct C2 link)	As established for the	Reserved or segregated	AMC3	

PDRA#	Edition/date	UAS characteristics	BVLOS/VLOS	Overflown area	Maximum range from remote pilot	Maximum height	Airspace	AMC# to Article 11	Notes
						reserved or segregated airspace	for the UAS operation		
PDRAG03	1.0 / January 2022	Maximum characteristic dimension of up to 3 m and typical kinetic energy of up to 34 kJ	BVLOS	Sparsely populated areas	n/a (direct C2 link)	50 m from ground unless in reserved or segregated airspace	Controlled or uncontrolled airspace if height is below 50 m, otherwise reserved or segregated airspace	AMC6	

Table 2 — List of PDRAs published as AMC to Article 11 of the UAS Regulation

For the purposes of the SORA, the following definitions should apply:

— ‘populated area’ should be understood as ‘congested area’, as defined in the Civil Aviation Regulation 2007: ‘in relation to a city, town or settlement, any area which is substantially used for residential, commercial or recreational purposes’; and

— ‘rural area’ is used in the context of the air risk and it means the volume outside a populated area and not within the aerodrome traffic zone (ATZ) of an aerodrome.

AMC1 Article 11 Rules for conducting an operational risk assessment

SPECIFIC OPERATIONS RISK ASSESSMENT (SORA) (SOURCE JARUS SORA V2.0) EDITION December 2020

1. Introduction

1.1 Preface

(a) This SORA is based on the document developed by JARUS, providing a vision on how to safely create, evaluate and conduct an unmanned aircraft system (UAS) operation. The SORA provides a methodology to guide both the UAS operator and the Authority in determining whether a UAS operation can be conducted in a safe manner. The document should not be used as a checklist, nor be expected to provide answers to all the challenges related to the integration of the UAS in the airspace. The SORA is a tailoring guide that allows a UAS operator to find a best fit mitigation means, and hence reduce the risk to an acceptable level. For this reason, it does not contain prescriptive requirements, but rather safety objectives to be met at various levels of robustness, commensurate with the risk.

(b) The SORA is meant to inspire UAS operators and Authorities and highlight the benefits of a harmonised risk assessment methodology. The feedback collected from real-life UAS operations will form the backbone of the updates in the upcoming revisions of the document.

1.2 Purpose of the document

(a) The purpose of the SORA is to propose a methodology to be used as an acceptable means to demonstrate compliance with this Subpart, that is to evaluate the risks and determine the acceptability of a proposed operation of a UAS within the ‘specific’ category.

(b) Due to the operational differences and the expanded level of risk, the ‘specific’ category cannot automatically take credit for the safety and performance data demonstrated with the large number of UA operating in the ‘open’ category. Therefore, the SORA provides a consistent approach to assess the additional risks associated with the expanded and new UAS operations that are not covered by the ‘open’ category.

(c) The SORA is not intended as a one-stop-shop for the full integration of all types of UAS in all classes of airspace.

(d) This methodology may be applied where the traditional approach to aircraft certification (approving the design, issuing an airworthiness approval and type certificate) may not be appropriate due to an applicant’s desire to operate a UAS in a limited or restricted manner. This methodology may also support the activities necessary to

determine the associated airworthiness requirements. This assumes that the safety objectives set forth in, or derived from, those applicable for the

'certified' category, are consistent with the ones set forth or derived for the 'specific' category.

(e) The methodology is based on the principle of a holistic/total system safety riskbased assessment model used to evaluate the risks related to a given UAS operation. The model considers the nature of all the threats associated with a specified hazard, the relevant design, and the proposed operational mitigations for a specific UAS operation. The SORA then helps to evaluate the risks systematically, and determine the boundaries required for a safe operation. This method allows the applicant to determine the acceptable risk levels, and to validate that those levels are complied with by the proposed operations. The Authority may also apply this methodology to gain confidence that the UAS operator can conduct the operation safely.

(f) To avoid repetitive individual approvals, The Authority will apply the methodology to define 'standard scenarios' or 'predefined risk assessments' for the identified types of ConOps with known hazards and acceptable risk mitigations.

(g) The methodology, related processes, and values proposed in this document are intended to guide the UAS operator when performing a risk assessment in accordance with this Subpart.

1.3 Applicability

(a) The methodology presented in this document is aimed at evaluating the safety risks involved with the operation of UAS of any class, size or type of operation (including military, experimental, research and development and prototyping). It is particularly suited, but not limited to, 'specific' operations for which a hazard and a risk assessment are required.

(b) The safety risks associated with collisions between UA and manned aircraft are in the scope of the methodology. The risk of a collision between two UA or between a UA and a UA carrying people will be addressed in future revisions of the document.

(c) In the event of a mishap, the carriage of people or payloads on board the UAS (e.g. weapons) that present additional hazards is explicitly excluded from the scope of this methodology.

(d) Security aspects are excluded from the applicability of this methodology when they are not limited to those confined by the airworthiness of the systems (e.g. the aspects relevant to protection from unlawful electromagnetic interference.)

(e) Privacy and financial aspects are excluded from the applicability of this methodology.

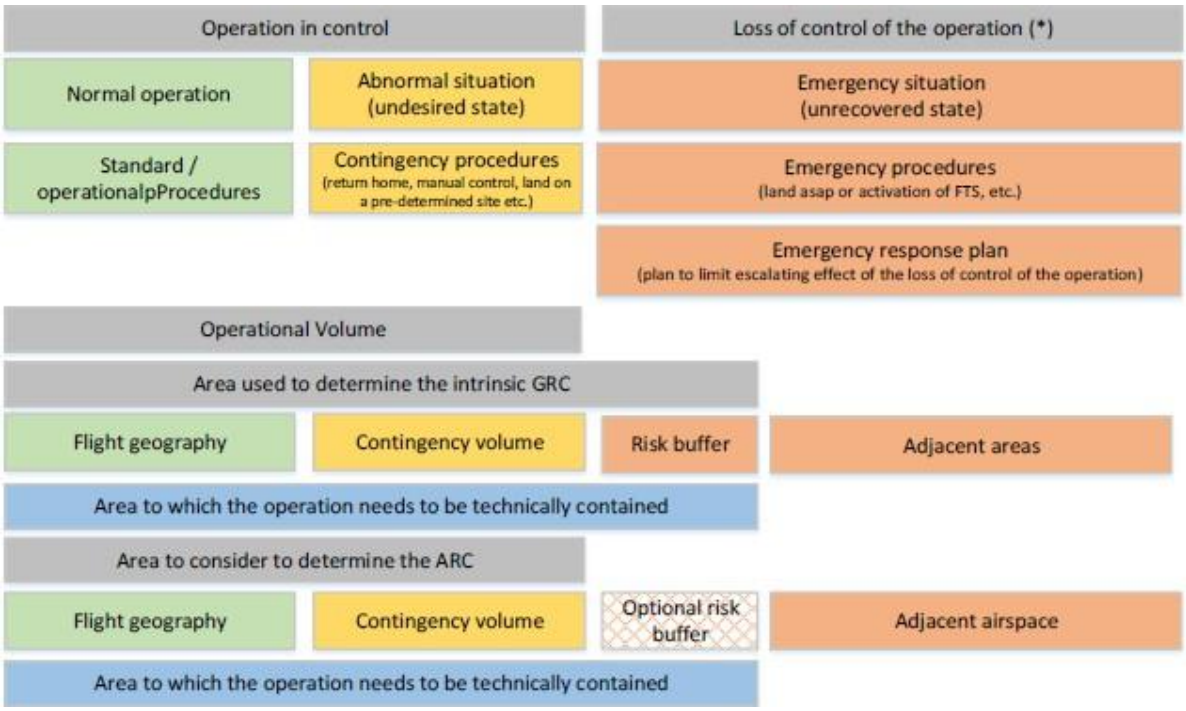
(f) The SORA can be used to support waiving the regulatory requirements applicable to the operation if it can be demonstrated that the operation can be conducted with an acceptable level of safety.

(g) In addition to performing a SORA in accordance with the UAS Regulation, the UAS operator must also ensure compliance with all the other regulatory requirements applicable to the operation that are not necessarily addressed by the SORA.

1.4 Key concepts and definitions

1.4.1 Semantic model

(a) To facilitate effective communication of all aspects of the SORA, the methodology requires the standardised use of terminology for the phases of operation, procedures, and operational volumes. The semantic model shown in Figure 1 provides a consistent use of the terms for all SORA users. Figure 2 provides a graphical representation of the model and a visual reference to further aid the reader in understanding the SORA terminology.



(*) The Loss of control of operation corresponds to situations:

- where the outcome of the situation highly relies on providence; or
- which could not be handled by a contingency procedure; or

- when there is grave and imminent danger of fatalities.

Figure 1 — SORA semantic model

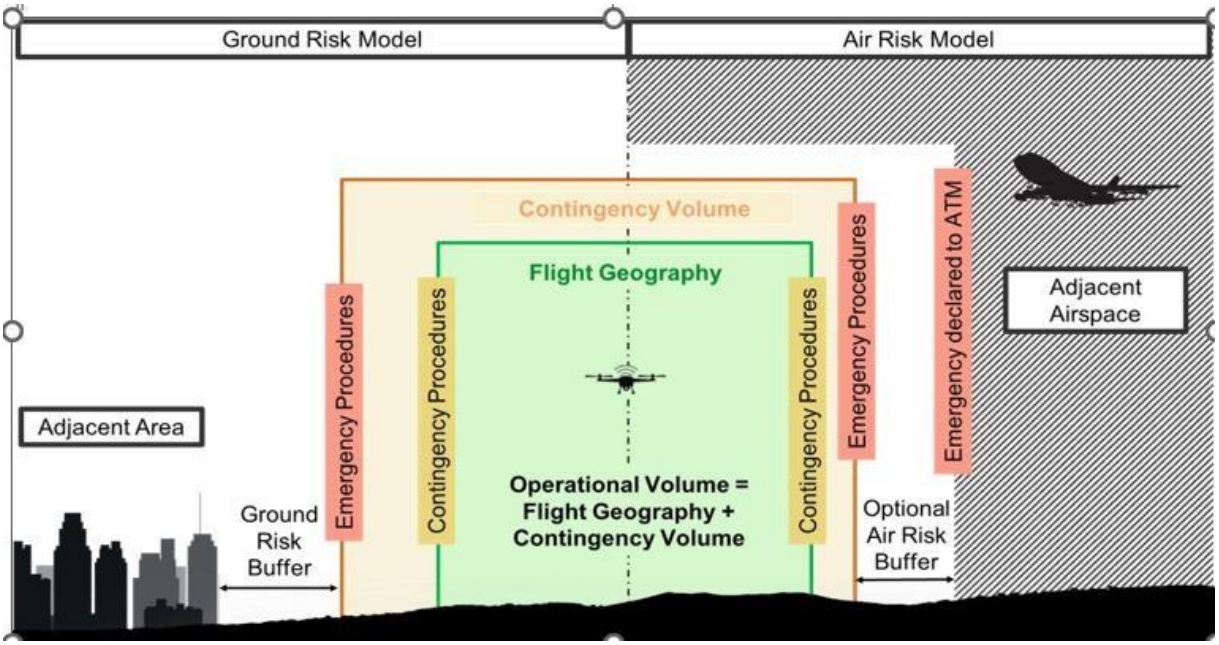


Figure 2 — Graphical representation of the SORA semantic model

1.4.2 Introduction to robustness

(a) To properly understand the SORA process, it is important to introduce the key concept of robustness. Any given risk mitigation or operational safety objective (OSO) can be demonstrated at differing levels of robustness. The SORA process proposes three different levels of robustness: low, medium and high, commensurate with the risk.

(b) The robustness designation is achieved using both the level of integrity (i.e. safety gain) provided by each mitigation, and the level of assurance (i.e. method of proof) that the claimed safety gain has been achieved. These are both risk-based.

(c) The activities used to substantiate the level of integrity are detailed in Annexes B, C, D and E. Those annexes provide either guidance material or reference industry standards and practices where applicable.

(d) General guidance for the level of assurance is provided below:

(1) A low level of assurance is where the applicant simply declares that the required level of integrity has been achieved.

(2) A medium level of assurance is where the applicant provides supporting evidence that the required level of integrity has been achieved. This is typically achieved by means of testing (e.g. for

technical mitigations) or by proof of experience (e.g. for humanrelated mitigations).

(3) A high level of assurance is where the achieved integrity has been found to be acceptable by a competent third party.

(e) The specific criteria defined in the Annexes take precedence over the criteria defined in paragraph d.

(f) Table 1 provides guidance to determine the level of robustness based on the level of integrity and the level of assurance:

	Low assurance	Medium assurance	High assurance
Low integrity	Low robustness	Low robustness	Low robustness
Medium integrity	Low robustness	Medium robustness	Medium robustness
High integrity	Low robustness	Medium robustness	High robustness

Table 1 — Determination of robustness level

(g) For example, if an applicant demonstrates a medium level of integrity with a low level of assurance, the overall robustness will be considered to be low. In other words, the robustness will always be equal to the lowest level of either the integrity or the assurance.

1.5 Roles and responsibilities

(a) While performing a SORA process and assessment, several key actors might be required to interact in different phases of the process. The main actors applicable to the SORA are described in this section.

(b) UAS operator — The UAS operator is responsible for the safe operation of the UAS, and hence the safety risk analysis. In accordance with Regulation 11 of the Civil Aviation (Unmanned Aircraft System) Regulations, the UAS operator must substantiate the safety of the operation by performing the specific operational and risk assessment, except for the cases defined by the same Regulation 11. Supporting material for the assessment may be provided by third parties (e.g. the manufacturer of the UAS or equipment, U-space service providers, etc.).

The UAS operator obtains an operational authorisation from the Authority/ANSP. A UAS operator having a LUC cannot be granted the privilege to assess compliance with the design requirements when a UAS with a design verification report1 (DVR) or a (restricted) type certificate ((R)TC) is required.

(c) Applicant — The applicant is the party seeking operational approval. The applicant becomes the UAS operator once the operation has been approved.

(d) UAS manufacturer — For the purposes of the SORA, the UAS manufacturer is the party that designs and/or produces the UAS. The UAS manufacturer has unique design evidence (e.g. for the system performance, the system architecture, software/hardware development documentation, test/analysis documentation, etc.) that they may choose to make available to one or many UAS operator(s) or to the Authority to help to substantiate the UAS operator's safety case. Alternatively, a potential UAS manufacturer may utilise the SORA to target design objectives for specific or generalised operations. To obtain airworthiness approval(s), these design objectives could be complemented by the use of certification specifications (CS) or industry consensus standards if they are found to be acceptable by the Authority.

(e) Component manufacturer — The component manufacturer is the party that designs and/or produces components for use in UAS operations. The component manufacturer has unique design evidence (e.g. for the system performance, the system architecture, software/hardware development documentation, test/analysis documentation, etc.) that they may choose to make available to one or many UAS operator(s) to substantiate a safety case.

(f) Authority — The Authority that is referred to throughout this AMC is the Authority in Mauritius in accordance with the Civil Aviation (Unmanned Aircraft System) Regulations to assess the safety case of UAS operations and to issue the operational authorisation in accordance with Regulation 11. The Authority may accept an applicant's SORA submission in whole or in part. Through the SORA process, the applicant may need to consult with the Authority to ensure the consistent application or interpretation of individual steps. The Authority must perform oversight of the UAS operator in accordance with paragraphs 9 of Regulation 14 of the UAS Regulation. The Authority will be responsible to verify compliance of the UAS design and its components with the applicable rules, and to verify compliance with the operational requirements and compliance of the personnel's competency with those rules. The following elements are related to the UAS design:

— OSOs #02 (limited to design criteria), #04, #05, #06, #10, #12, #18, #19 (limited to criterion #3), #20, #23 (limited to criterion #1) and #24;

— M2 mitigation for ground risk (criterion #1);

— verification of the system to contain the UAS to avoid an infringement of the adjacent areas on the ground and/or adjacent airspace, in accordance with Step #9 of the SORA process.

If the UAS operation is classified as SAIL V and VI, compliance with the design provisions defined by SORA (i.e. design-related OSOs, mitigation means linked with the design and containment function) should be demonstrated through a type certificate (TC) issued by the State of Design meeting MCAR (Part 21) requirements.. For the other OSOs and mitigation means, the Authority may verify compliance or may define which entity is able to verify compliance with them as a third party.

(1) If the UAS operation is classified as SAIL IV, compliance with the design related SORA provisions (i.e. design-related OSOs, mitigation means linked with the design and containment function) should be demonstrated through a DVR issued by State of design and Certification.

Evidence of compliance with the other OSOs and mitigations (not related to design) will be provided to the Authority according to the level of robustness of the OSOs, that will assess them as part of the application for the operational authorisation.

(2) If the UAS operation is classified as SAIL I, II or III, the Authority may accept a declaration submitted by the UAS operator for the compliance with all OSOs and mitigations related to design. The Authority may check the statements of the UAS operator, in particular with regard to the claimed level of integrity and robustness of the UAS for the considered SAIL.

(3) Despite the SAIL, when the claimed level of robustness of the mitigation means M2 is high, the Authority should require the operator to use a UAS with a DVR issued by the State of Design and certification limited to compliance with those mitigation means1.

(g) ANSP — The ANSP is the designated provider of air traffic service in a specific area of operation (airspace). The ANSP assesses whether the proposed flight can be safely conducted in the particular airspace that it covers, and if so, authorises the flight.

(h) U-space service provider — U-space service providers are entities that provide services to support the safe and efficient use of airspace.

(i) Remote pilot — The remote pilot is designated by the UAS operator, or, in the case of general aviation, the aircraft owner, as being charged with safely conducting the flight.

2. The SORA process

2.1 Introduction to risk

(a) Many definitions of the word ‘risk’ exist in the literature. One of the easiest and most understandable definitions is provided in SAE ARP 4754A / EUROCAE ED-79A: ‘the combination of the frequency

(probability) of an occurrence and its associated level of severity'. This definition of 'risk' is retained in this document.

(b) The consequence of an occurrence will be designated as harm of some type.

(c) Many different categories of harm arise from any given occurrence. Various authors on this topic have collated these categories of harm as supported by the literature. This document will focus on occurrences of harm (e.g. a UAS crash) that are short-lived and usually give rise to a near loss of life. Chronic events (e.g. toxic emissions over a period of time) are explicitly excluded from this assessment. The categories of harm in this document are the potential for:

(1) fatal injuries to third parties on the ground;

(2) fatal injuries to third parties in the air; or

(3) damage to critical infrastructure.

(d) It is acknowledged that the Authorities, when appropriate, may consider additional categories of harm (e.g. the disruption of a community, environmental damage, financial loss, etc.). This methodology could also be used for those categories of harm.

(e) Several studies have shown that the amount of energy needed to cause fatal injuries, in the case of a direct hit, is extremely low (i.e. in the region of few dozen Joules.) The energy levels of operations addressed within this document are likely to be significantly higher, and therefore the retained harm is the potential for fatal injuries. By application of the methodology, the applicant has the opportunity to claim lower lethality either on a case-by-case basis, or systematically if allowed by the competent authorities (e.g. in the 'open' category).

(f) Fatal injury is a well-defined condition and, in most countries, is known by the authorities. Therefore, the risk of under-reporting fatalities is almost non-existent. The quantification of the associated risk of fatality is straightforward. The usual means to measure fatalities is by the number of deaths within a particular time interval (e.g. the fatal accident rate per million flying hours), or the number of deaths for a specified circumstance (e.g. the fatal accident rate per number of takeoffs).

(g) Damage to critical infrastructure is a more complex condition. Therefore, the quantification of the associated risks may be difficult and subject to cooperation with the organisation responsible for the infrastructure.

2.2 SORA process outline

(a) The SORA methodology provides a logical process to analyse the proposed ConOps and establish an adequate level of confidence that the operation can be conducted with an acceptable level of risk. There are ten steps that support the SORA methodology and each of these

steps is described in the following paragraphs and further detailed, when necessary, in the relevant annexes.

(b) The SORA focuses on the assessment of air and ground risks. In addition to air and ground risks, an additional risk assessment of critical infrastructure should also be performed. This should be done in cooperation with the organisation responsible for the infrastructure, as they are most knowledgeable of those threats. Figure 3 outlines the ten steps of the risk model, while Figure 4 provides an overall understanding of how to arrive at an air risk class (ARC) for a given operation.

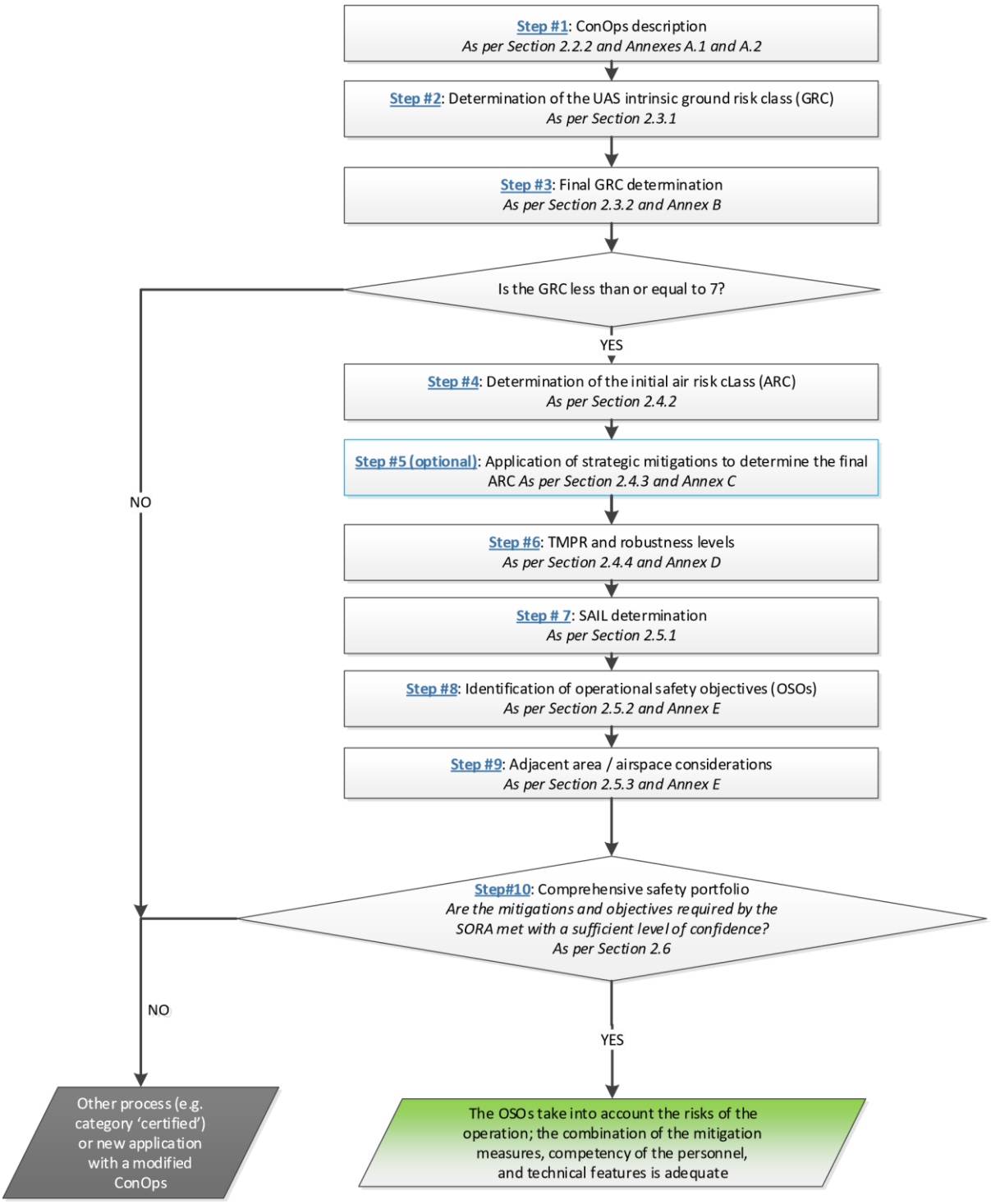


Figure 3 — The SORA process

Note: If operations are conducted across different environments, some steps may need to be repeated for each particular environment.

2.2.1 Pre-application evaluation

(a) Before starting the SORA process, the applicant should verify that the proposed operation is feasible (i.e. not subject to specific exclusions from the Authority or subject to an STS). Things to verify before beginning the SORA process are whether:

(1) the operation falls under the ‘open’ category;

(2) the operation is covered by a ‘standard scenario’ included in the appendix to the UAS Regulation or by a ‘predefined risk assessment’ published by EASA or any other authority.

(3) the operation falls under the ‘certified’ category; or

(4) the operation is subject to a specific NO-GO from the Authority.

If none of the above cases applies, the SORA process should be applied.

2.2.2 Step #1 — ConOps description

(a) The first step of the SORA requires the applicant to collect and provide the relevant technical, operational and system information needed to assess the risk associated with the intended operation of the UAS. Annex A to this document provides a detailed framework for data collection and presentation. The ConOps description is the foundation for all other activities, and it should be as accurate and detailed as possible. The ConOps should not only describe the operation, but also provide insight into the UAS operator’s operational safety culture. It should also include how and when to interact with the ANSP. Therefore, when defining the ConOps, the UAS operator should give due consideration to all the steps, mitigations and OSOs provided in Figures 3 and 4.

(b) Developing the ConOps can be an iterative process; therefore, as the SORA process is applied, additional mitigations and limitations may be identified, requiring additional associated technical details, procedures, and other information to be provided/updated in the ConOps. This should culminate in a comprehensive ConOps that fully and accurately describes the proposed operation as envisioned.

2.3 The ground risk process

2.3.1 Step #2 – Determination of the intrinsic UAS ground risk class (GRC)

(a) The intrinsic UAS ground risk relates to the risk of a person being struck by the UAS (in the case of a loss of UAS control with a reasonable assumption of safety).

(b) To establish the intrinsic GRC, the applicant needs the maximum UA characteristic dimension (e.g. the wingspan for a fixed-wing UAS, the blade diameter for rotorcraft, the maximum dimension for multi-copters, etc.) and the knowledge of the intended operational scenario.

(c) The applicant needs to have defined the area at risk when conducting the operation (also called the 'area of operation') including:

(1) the operational volume, which is composed of the flight geography and the contingency volume. To determine the operational volume, the applicant should consider the position-keeping capabilities of the UAS in 4D space (latitude, longitude, height and time). In particular, the accuracy of the navigation solution, the flight technical error of the UAS and the path definition error (e.g. map errors), and latencies should be considered and addressed in this determination;

(2) whether or not the area is a controlled ground area; and

(3) the associated ground risk buffer with at least a 1:1 rule , or for rotary wing UA, defined using a ballistic methodology approach acceptable to the A authority.

(d) Table 2 illustrates how to determine the intrinsic ground risk class (GRC). The intrinsic GRC is found at the intersection of the applicable operational scenario and the maximum UA characteristic dimension that drives the UAS lethal area. If there is a mismatch between the maximum UAS characteristic dimension and the typical kinetic energy expected, the applicant should provide substantiation for the chosen column.

Intrinsic UAS ground risk class				
Max UAS characteristics dimension	1 m / approx. 3 ft	3 m / approx. 10 ft	8 m / approx. 25 ft	>8 m / approx. 25 ft
Typical kinetic energy expected	< 700 J (approx. 529 ft lb)	< 34 kJ (approx. 25 000 ft lb)	< 1 084 kJ (approx. 800 000 ft lb)	> 1 084 kJ (approx. 800 000 ft lb)
Operational scenarios				
VLOS/BVLOS over a controlled ground area[3]	1	2	3	4
VLOS over a sparsely populated area	2	3	4	5
BVLOS over a sparsely populated area	3	4	5	6
VLOS over a populated area	4	5	6	8
BVLOS over a populated area	5	6	8	10
VLOS over an assembly of people	7			
BVLOS over an assembly of people	8			

Table 2 — Determination of the intrinsic GRC

(e) The operational scenarios describe an attempt to provide discrete categorisations of operations with increasing numbers of people at risk. In principle, it is possible to use either qualitative criteria (please refer to next point (f)) or quantitative criteria, or consider both criteria, to assess if an operation takes place over sparsely populated areas, populated areas, or assemblies of people.

(f) Qualitative assessment: the volume to be used by the operator to classify the operation includes the operational volume and the ground risk buffer (as defined by a semantic model), which determine the intrinsic GRC.

GM1 Article 2(3) 'Definitions I DEFINITION OF 'ASSEMBLIES OF PEOPLE'' provides guidance on when an operation is classified as taking place over assemblies of people.

An operation should be classified as taking place over a populated area if the volume that is used to determine the intrinsic GRC:

— does not include assemblies of people, and

— includes areas that are substantially used for residential, commercial or recreational purposes.

(g) EVLOS operations are to be considered to be BVLOS for the intrinsic GRC determination.

(h) Controlled ground areas2 are a way to strategically mitigate the risk on ground (similar to flying in segregated airspace); the UAS operator should ensure, through appropriate procedures, that no uninvolved person is in the area of operation, as defined in Section 2.3.1(c).

(i) An operation occurring in a populated environment cannot be intrinsically classified as being in a sparsely populated environment, even in cases where the footprint of the operation is completely within special risk areas (e.g. rivers, railways, and industrial estates). The applicant can make the claim for a lower density and/or shelter with Step #3 of the SORA process.

(j) Operations that do not have a corresponding intrinsic GRC (i.e. grey cells on the table) are not supported by the SORA methodology.

(k) When evaluating the typical kinetic energy expected for a given operation, the applicant should generally use the airspeed, in particular Vcruise for fixed wing aircraft and the terminal velocity for other aircraft. Specific designs (e.g. gyrocopters) might need additional considerations. Guidance useful in determining the terminal velocity can be found at https://www1.grc.nasa.gov/beginners-guide-to-aeronautics/termvel/.

(l) The nominal size of the crash area for most UAS can be anticipated by considering both the size and the energy used in the ground risk determination. There are certain cases or design aspects that are non-typical and will have a significant effect on the lethal area of the UAS, such as the amount of fuel, high-energy rotors/props, frangibility, material, etc. These may not have been considered in the intrinsic GRC determination table. These considerations may lead to a decrease/increase in the intrinsic GRC. The use of industry standards or dedicated research might provide a simplified path for this assessment.

2.3.2 Step #3 – Final GRC determination

(a) The intrinsic risk of a person being struck by the UAS (in case of a loss of control of the operation) can be controlled and reduced by means of mitigation.

(b) The mitigations used to modify the intrinsic GRC have a direct effect on the safety objectives associated with a particular operation, and therefore it is important to ensure their robustness. This has particular relevance for technical mitigations associated with the ground risk (e.g. an emergency parachute).

(c) The final GRC determination (step #three) is based on the availability of these mitigations to the operation. Table 3 provides a list of potential mitigations and the associated relative correction factor. A positive number denotes an increase in the GRC, while a negative number results in a decrease in the GRC. All the mitigations should be applied in numeric sequence to perform the assessment. Annex B provides additional details on how to estimate the robustness of each mitigation. competent authorities may define additional mitigations and the relative correction factors.

·¤	··¤	¤ Robustness·¤ ¤		
Mitigation· Sequence·¤	Mitigations·for·ground·risk·¤	Low/None·¤	Medium·¤	High·¤
1·¤	M1·—·Strategic·mitigations·for·ground·risk[5]·¤	0:·None·-- 1:·Low·¤	-2·¤	-4·¤
2·¤	M2·—·Effects·of·ground·impact·are·reduced[6]·¤	0·¤	-1·¤	-2·¤
3·¤	M3·—·An·emergency·response·plan·(ERP)·is·in· place,·the·UAS·operator·is·validated·and·effective·¤	1·¤	0·¤	-1·¤

Table 3 — Mitigations for final GRC determination

(d) When applying mitigation M1, the GRC cannot be reduced to a value lower than the lowest value in the applicable column in Table 2. This is because it is not possible to reduce the number of people at risk below that of a controlled area.

(e) For example, in the case of a 2.5 m UAS (second column in Table 2) flying in visual line-of-sight (VLOS) over a sparsely populated area, the intrinsic GRC is 3. Upon analysis of the ConOps, the applicant claims to reduce the ground risk by first applying M1 at medium robustness (a GRC reduction of 2). In this case, the result of applying M1 is a GRC of 2, because the GRC cannot be reduced any lower than the lowest value for that column. The applicant then applies M2 using a parachute system, resulting in a further reduction of 1 (i.e. a GRC of 1). Finally, M3 (the ERP) has been developed to medium robustness with no further reduction as per Table 3.

(f) The final GRC is established by adding all the correction factors (i.e. -1-1-0=2) and adapting the GRC by the resulting number (3-2=1).

(g) If the final GRC is greater than 7, the operation is not supported by the SORA process.

(h) In general, a quantitative approach to mitigation means allows to reduce the intrinsic GRC by 1 point if the mitigation means reduce the risk of the operation by a factor of approximately 10 (90 % reduction) compared to the risk that is assessed before the mitigation means are applied. Such quantitative criteria should be used to validate the risk reduction that is claimed when applying Annex B to AMC1 to Article 11.

2.4 The air risk process

2.4.1 Air risk process overview

(a) The SORA uses the operational airspace defined in the ConOps as the baseline to evaluate the intrinsic risk of a mid-air collision, and by determining the air risk category (ARC). The ARC may be modified/lowered by applying strategic and tactical mitigation means. The application of strategic mitigations may lower the ARC level. An

example of strategic mitigations to reduce the risk of a collision may be by operating during certain time periods or within certain boundaries. After applying the strategic mitigations, any residual risk of a mid-air collision is addressed by means of tactical mitigations.

(b) Tactical mitigations take the form of detect and avoid (DAA) systems or alternate means, such as ADS-B, FLARM, U-space services or operational procedures. Depending on the residual risk of a mid-air collision, the tactical mitigation performance requirement(s) (TMPR(s)) may vary.

(c) As part of the SORA process, the UAS operator should cooperate with the relevant service provider for the airspace (e.g. the ANSP or U-space service provider) and obtain the necessary authorisations. Additionally, generic local authorisations or local procedures allowing access to a certain portion of controlled airspace may be used if available (e.g. the Low Altitude

Authorization and Notification Capability – LAANC – system in the United States).

(d) Irrespective of the results of the risk assessment, the UAS operator should pay particular attention to all the features that may increase the detectability of the UA in the airspace. Therefore, technical solutions that improve the electronic conspicuousness or detectability of the UAS are recommended.

2.4.2 Step #4 - Determination of the initial air risk class (ARC)

(a) The Authority, ANSP, or U-space service provider, may elect to directly map the airspace collision risks using airspace characterisation studies. These maps would directly show the initial ARC for a particular volume of airspace. If the Authority, ANSP, or U-space service provides an air collision risk map (static or dynamic), the applicant should use that service to determine the initial ARC, and go directly to Section 2.4.3 ‘Application of strategic mitigations’ to reduce the initial ARC.

(b) As seen in Figure 4, the airspace is categorised into 13 aggregated collision risk categories. These categories were characterised by the altitude, controlled versus uncontrolled airspace, airport/heliport versus non-airport/non-heliport environments, airspace over urban versus rural environments, and lastly atypical (e.g. segregated) versus typical airspace.

(c) To assign the proper ARC for the type of UAS operation, the applicant should use the decision tree found in Figure 4.

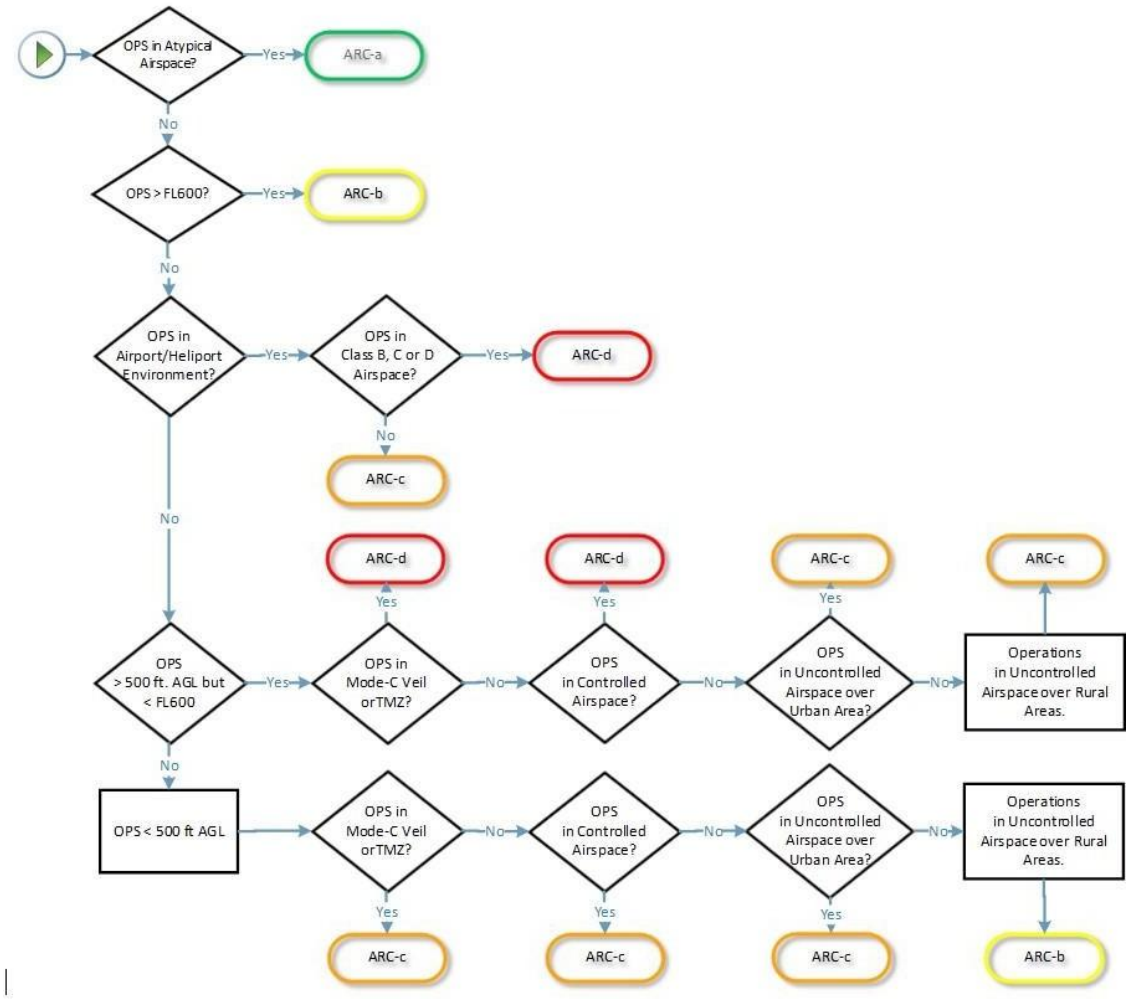


Figure 4 — ARC assignment process

(d) The ARC is a qualitative classification of the rate at which a UAS would encounter a manned aircraft in typical generalised civil airspace. The ARC is an initial assignment of the aggregated collision risk for the airspace, before mitigations are applied. The actual collision risk of a specific local operational volume could be much different, and can be addressed with the application of strategic mitigations to reduce the ARC (this step is optional, see Section 2.4.3, Step #5).

(e) Although the static generalised risk put forward by the ARC is conservative (i.e. it stays on the safe side), there may be situations where that conservative assessment may not suffice. It is important for both the Authority and the UAS operator to take great care to understand the operational volume and under which circumstances the definitions in Figure 4 could be invalidated. In some situations, the Authority may raise the operational volume ARC to a level which is greater than that advocated by Figure 4. The ANSP should be consulted to ensure that the assumptions related to the operational volume are accurate.

(f) ARC-a is generally defined as airspace where the risk of a collision between a UAS and a manned aircraft is acceptable without the addition of any tactical mitigation.

(g) ARC-b, ARC-c, ARC-d generally define volumes of airspace with increasing risk of a collision between a UAS and a manned aircraft.

(h) During the UAS operation, the operational volume may span many different airspace environments. The applicant needs to perform an air risk assessment for the entire range of the operational volume. An example scenario of operations in multiple airspace environments is provided at the end of Annex C.

2.4.3 Step #5 — Application of strategic mitigations to determine the residual ARC (optional)

(a) As stated before, the ARC is a generalised qualitative classification of the rate at which a UAS would encounter a manned aircraft in the specific airspace environment. However, it is recognised that the UAS operational volume may have a different collision risk from the one that the generalised initial ARC assigned.

(b) If an applicant considers that the generalised initial ARC assigned is too high for the condition in the local operational volume, then they should refer to Annex C for the ARC reduction process.

(c) If the applicant considers that the generalised initial ARC assignment is correct for the condition in the local operational volume, then that ARC becomes the residual ARC.

2.4.4 Step #6 — TMPR and robustness levels

Tactical mitigations are applied to mitigate any residual risk of a mid-air collision that is needed to achieve the applicable airspace safety objective. Tactical mitigations will take the form of either ‘see and avoid’ (i.e. operations under VLOS), or they may require a system which provides an alternate means of achieving the applicable airspace safety objective (operation using a DAA, or multiple DAA systems). Annex D provides the method for applying tactical mitigations.

2.4.4.1 Operations under VLOS/EVLOS

(a) VLOS is considered to be an acceptable tactical mitigation for collision risk for all ARC levels. Notwithstanding the above, the UAS operator is advised to consider additional means to increase the situational awareness with regard to air traffic operating in the vicinity of the operational volume.

(b) Operational UAS flights under VLOS do not need to meet the TMPR, nor the TMPR robustness requirements. In the case of multiple segments of

the flight, those segments conducted under VLOS do not have to meet the TMPR, nor the TMPR robustness requirements, whereas those conducted under BVLOS do need to meet the TMPR and the TMPR robustness requirements.

(c) In general, all VLOS requirements are applicable to EVLOS. EVLOS may have additional requirements over and above those of VLOS. The EVLOS verification and communication latency between the remote pilot and the observers should be less than 15 seconds.

(d) Notwithstanding the above, the applicant should have a documented VLOS de-confliction scheme, in which the applicant explains which methods will be used for detection, and defines the associated criteria applied for the decision to avoid incoming traffic. If the remote pilot relies on detection by observers, the use of phraseology will have to be described as well.

(e) For VLOS operations, it is assumed that an observer is not able to detect traffic beyond 2 NM. (Note that the 2 NM range is not a fixed value and it may largely depend on the atmospheric conditions, aircraft size, geometry, closing rate, etc.). Therefore, the UAS operator may have to adjust the operation and/or the procedures accordingly.

2.4.4.2 Operations under a DAA system — TMPR

(a) For operations other than VLOS, the applicant will use the residual ARC and Table 4 below to determine the TMPR.

Residual ARC	TMPRs	TMPR level of robustness
ARC-d	High	High
ARC-c	Medium	Medium
ARC-b	Low	Low
ARC-a	No requirement	No requirement

Table 4 — TMPRs and TMPR level of robustness assignment

(b) High TMPR (ARC-d): This is airspace where either the manned aircraft encounter rate is high, and/or the available strategic mitigations are low. Therefore, the resulting residual collision risk is high, and the TMPR is also high. In this airspace, the UAS may be operating in integrated airspace and will have to comply with the operating rules and procedures applicable to that airspace, without reducing the existing capacity, decreasing safety, negatively impacting current operations with manned aircraft, or increasing the risk to airspace users or persons and property on the ground. This is no different from the requirements for the integration of comparable new and novel technologies in manned

aviation. The performance level(s) of those tactical mitigations and/or the required variety of tactical mitigations are generally higher than for the other ARCs. If operations in this airspace are conducted more routinely, the Authority is expected to require the UAS operator to comply with the recognised DAA system standards (e.g. those developed by RTCA SC-228 and/or EUROCAE WG-105).

(c) Medium TMPR (ARC-c): A medium TMPR will be required for operations in airspace where the chance of encountering manned aircraft is reasonable, and/or the strategic mitigations available are medium. Operations with a medium TMPR will likely be supported by the systems currently used in aviation to aid the remote pilot in the detection of other manned aircraft, or by systems designed to support aviation that are built to a corresponding level of robustness. Traffic avoidance manoeuvres could be more advanced than for a low TMPR.

(d) Low TMPR (ARC-b): A low TMPR will be required for operations in airspace where the probability of encountering another manned aircraft is low, but not negligible, and/or where strategic mitigations address most of the risk, and the resulting residual collision risk is low. Operations with a low TMPR are supported by technology that is designed to aid the remote pilot in detecting other traffic, but which may be built to lower standards. For example, for operations below 120 m, the traffic avoidance manoeuvres are expected to mostly be based on a rapid descent to an altitude where manned aircraft are not expected to ever operate.

(e) No performance requirement (ARC-a): This is airspace where the manned aircraft encounter rate is expected to be extremely low, and therefore there is no requirement for a TMPR. It is generally defined as airspace where the risk of a collision between a UAS and a manned aircraft is acceptable without the addition of any tactical mitigation. An example of this may be UAS flight operations in some parts of Alaska or northern Sweden, where the manned aircraft density is so low that the airspace safety threshold could be met without any tactical mitigation.

(f) Annex D provides information on how to satisfy the TMPR based on the available tactical mitigations and the TMPR level of robustness.

2.4.4.3 Consideration of additional airspace/operational requirements

(a) Modifications to the initial and subsequent approvals may be required by the Authority or the ANSP as safety and operational issues arise.

(b) The UAS operator and the Authority need to be cognisant that the ARCs are a generalised qualitative classification of the collision risk. Local circumstances could invalidate the aircraft density assumptions of the SORA, for example, due to special events. It is important for both the Authority and the UAS operator to fully understand the airspace and air-

traffic flows, and develop a system which can alert UAS operators to changes to the airspace on a local level. This will allow the UAS operator to safely address the increased risks associated with these events.

(c) There are many airspace, operational and equipment requirements which have a direct impact on the collision risk of all aircraft in the airspace. Some of these requirements are general and apply to all volumes of airspace, while some are local and are required only for a particular volume of airspace. The SORA cannot possibly cover all the possible requirements for all the conditions in which the UAS operator may wish to operate. The applicant and the Authority need to work closely together to define and address these additional requirements.

(d) The SORA process should not be used to support operations of a UAS in a given airspace without the UAS being equipped with the required equipment for operations in that airspace (e.g. the equipment required to ensure interoperability with other airspace users). In these cases, specific exemptions may be granted by the Authority. Those exemptions are outside the scope of the SORA.

(e) Operations in controlled airspace, an airport/heliport environment or a Mode-C Veil/transponder mandatory zone (TMZ) will likely require prior approval from the ANSP. The applicant should ensure that they involve the ANSP/authority prior to commencing operations in these environments.

2.5 Final assignment of specific assurance and integrity level (SAIL) and OSO

2.5.1 Step #7 SAIL determination

(a) The SAIL parameter consolidates the ground and air risk analyses, and drives the required activities. The SAIL represents the level of confidence that the UAS operation will remain under control.

(b) After determining the final GRC and the residual ARC, it is then possible to derive the SAIL associated with the proposed ConOps.

(c) The level of confidence that the operation will remain under control is represented by the SAIL. The SAIL is not quantitative, but instead corresponds to:

(1) the OSO to be complied with (see Table 6);

(2) the description of the activities that might support compliance with those objectives; and

(3) the evidence that indicates that the objectives have been satisfied.

(d) The SAIL assigned to a particular ConOps is determined using Table 5:

SAIL determination				
	Residual ARC			
Final GRC	a	b	c	d
	I	II	IV	VI
	II	II	IV	VI
	III	III	IV	VI
≤2 3 4 5 6 7 >7	IV	IV	IV	VI
	V	V	V	VI
	VI	VI	VI	VI
	Category C operation			

2.5.2 Step #8 — Identification of the operational safety objectives (OSOs)

(a) The last step of the SORA process is to use the SAIL to evaluate the defences within the operation in the form of OSOs, and to determine the associated level of robustness. Table 6 provides a qualitative methodology to make this determination. In this table, O is optional, L is recommended with low robustness, M is recommended with medium robustness, and H is recommended with high robustness. The various OSOs are grouped based on the threat they help to mitigate; hence, some OSOs may be repeated in the table.

(b) Table 6 is a consolidated list of the common OSOs that historically have been used to ensure safe UAS operations. It represents the collected experience of many experts, and is therefore a solid starting point to determine the required safety objectives for a specific operation. The Authority that issue the operational authorisation may define additional OSOs for a given SAIL and the associated level of robustness.

2.5.3 Step #9 – Adjacent area/airspace considerations

(a) The objective of this section is to address the risk posed by a loss of control of the operation, resulting in an infringement of the adjacent areas on the ground and/or adjacent airspace. These areas may vary with different flight phases.

(b) Safety requirements for 'basic containment' are:

No probable[1] failure[2] of the UAS or any external system supporting the operation should lead to operation outside the operational volume. *Compliance with the requirement above should be substantiated by a design and installation appraisal and should include at least:* *— the design and installation features (independence, separation and redundancy);* *Note: Independence, separation and redundancy are not necessarily required, but they may be useful to substantiate the robustness of the containment system.* *— any relevant particular risk (e.g. hail, ice, snow, electromagnetic interference, etc.) associated with the ConOps.* The Authority may accept a declaration for the claimed integrity. The applicant declares that the required level of integrity has been achieved and supporting evidence is available.

[1] The term 'probable' needs to be understood in its qualitative interpretation, i.e. 'Anticipated to occur one or more times during the entire system/operational life of an item.'

[2] The term 'failure' needs to be understood as an occurrence that affects the operation of a component, part, or element such that it can no longer function as intended. Errors may cause failures, but are not considered to be failures. Some structural or mechanical failures may be excluded from the criterion if it can be shown that these mechanical parts were designed according to aviation industry best practices.

(c) The enhanced containment applies to operations conducted:

(1) either where the adjacent areas:

(i) contain assemblies of people1 unless the UAS is already approved for operations over assemblies of people; or

(ii) are ARC-d unless the residual ARC of the airspace area intended to be flown within the operational volume is already ARC-d;

(2) Or where the operational volume is in a populated area where: (i) M1 mitigation has been applied to lower the GRC; or (ii) operating in a controlled ground area.

(d) The enhanced containment consists in the following safety requirements:

(a)	The UAS is designed to standards that are considered adequate by the Authority and/or in accordance with a means of compliance that is acceptable to that authority such that: (1) the probability of the UA leaving the operational volume should be less than 10^{-4}/FH; and (2) no single failure* of the UAS or any external system supporting the operation should lead to its operation outside the ground risk buffer. Compliance with the requirements above should be substantiated by analysis and/or test data with supporting evidence.
(b)	Software (SW) and airborne electronic hardware (AEH) whose development error(s) could **directly** (refer to Note 2) lead to operations outside the ground risk buffer should be developed to an industry standard or methodology that is recognised as being adequate by EASA.

For UA with maximum characteristic dimensions not greater than 3 m, operated up to SAIL II operations, the Authority may accept a declaration from the applicant for the compliance with the MoC to Light-UAS.25112. For UAS configurations exceeding the applicability of such MoC3, the Authority may decide to still accept declarations based on such MoC with

evidence available, or to accept appropriate MoC proposed by the applicant. Otherwise, the Authority may request the applicant to use a UAS for which a foreign safety Agency has verified the claimed integrity.

As it is not possible to anticipate all local situations, the UAS operator, the Authority and the ANSP should use sound judgement with regard to the definition of the

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3 EASA is developing MoC applicable to different UAS configurations. Until these are available, the Authority may define means of compliance for special configurations (e.g. tethered drones) where a DVR may not be appropriate.

'adjacent airspace' as well as the 'adjacent areas'. For example, for a small UAS with a limited range, these definitions are not intended to include busy airport/heliport environments 30 kilometres away. The airspace bordering the UAS volume of operation should be the starting point of the determination of the adjacent airspace. In exceptional cases, the airspace beyond those volumes that border the UAS volume of operation may also have to be considered.

Note 1: The safety requirements as proposed in this section cover both the integrity and assurance levels.

Note 2: The third safety requirement in Section 2.5.3(c) does not imply a systematic need to develop the SW and AEH according to an industry standard or methodology recognised as adequate by the Authority. The use of the term 'directly' means that a development error in a software or an airborne electronic hardware would lead the UA outside the ground risk buffer without the possibility for another system to prevent the UA from exiting the operational volume.

2.6 Step #10 — comprehensive safety portfolio

(a) The SORA process provides the applicant, the Authority and the ANSP with a methodology which includes a series of mitigations and safety objectives to be considered to ensure an adequate level of confidence that the operation can be safely conducted. These are:

(1) mitigations used to modify the intrinsic GRC;

(2) strategic mitigations for the initial ARC;

(3) tactical mitigations for the residual ARC; (4) adjacent area/airspace considerations; and

(5) OSOs.

(b) The satisfactory substantiation of the mitigations and objectives required by the SORA process provides a sufficient level of confidence that the proposed operation can be safely conducted.

(c) The UAS operator should be sure to address any additional requirements that were not identified by the SORA process (e.g. for security, environmental protection, etc.) and identify the relevant stakeholders (e.g. environmental protection agencies, national security bodies, etc.). The activities performed within the SORA process will likely address those additional needs, but they may not be considered to be sufficient at all times.

(d) The UAS operator should ensure the consistency between the SORA safety case and the actual operational conditions (i.e. at the time of the flight).

A to AMC1 to Annex Article 11

CONOPS: GUIDELINES ON COLLECTING AND PRESENTING SYSTEM AND OPERATIONAL INFORMATION FOR SPECIFIC UAS OPERATIONS

A.0 General guidelines

This document must be original work completed and understood by the applicant (operator). Applicants must take responsibility for their own safety cases, whether the material originates from this template or otherwise.

A.0.1 Document control

Applicants should include an amendment record at the beginning of the document to record changes and show how that the document is controlled.

Amendment/ Revision/ Issue Number	Date	Amended by	Signed
a, b, c or 1, 2, 3 etc.	DDMMYYYY	Name of the person carrying out the amendment/ revision/ issue number	Signature of person carrying out the amendment/ revision/ issue number

This section is critical to ensure appropriate document control.

Any significant changes to the ConOps may require further assessment and approval by the Authority prior to further operations being conducted.

A.0.2 References

(a) List all references (documents, URL, manuals, appendices) mentioned in the ConOps:

#	Title	Description	Amendment/ Revision/ Issue Number
[1]			
[2]			

A.1 Guidance for the collection and presentation of operationally relevant information

The template below provides section headings detailing the subject areas that should be addressed when producing the ConOps, for the purposes of demonstrating that a UAS operation can be conducted safely. The template layouts as presented are not prescriptive, but the subject areas detailed should be included in the ConOps documentation as required for the particular operation(s), in order to provide the minimum required information and evidence to perform the SORA.

A.1.1 Reserved A.1.2 Organisation overview

(a) This section describes how the organisation is defined, to support safe operations. It should include:

(1) the structure of the organisation and its management, and

(2) the responsibilities and duties of the UAS operator.

A.1.2.1 Safety

(a) The ‘specific’ category covers operations where the operational risks are higher and therefore the management of safety is particularly important. The applicant should describe how safety is integrated in the organisation, and the safety management system that is in place, if applicable.

(b) Any additional safety-related information should be provided.

A.1.2.2 Design and production

(a) If the organisation is responsible for the design and/or production of the UAS, this section should describe the design and/or the production organisation.

(b) It should provide information on the manufacturer of the UAS to be used if the UAS is not manufactured or produced by the operator, i.e. by a thirdparty manufacturer.

(c) If required, information on the production organisation of the third-party organisation should be provided as evidence.

A.1.2.3 Training of staff involved in operations

This section should describe the training organisation or entity that qualifies all the staff involved in operations with respect to the ConOps.

A.1.2.4 Maintenance

This section should describe:

(a) the general maintenance philosophy of the UAS;

b) the maintenance procedures for the UAS; and

(c) the maintenance organisation, if required.

A.1.2.5 Crew

This section should describe:

(a) the responsibilities and duties of personnel, including all the positions and people involved, for functions such as:

(1) the remote pilot (including the composition of the flight team according to the nature of the operation, its complexity, the type of UAS, etc.); and

(2) support personnel (e.g. visual observers (VOs), launch crew, and recovery crew);

(b) the procedure for multi-crew coordination if more than one person is directly involved in the flight operations;

(c) the operation of different types of UAS, including details of any limitations to the types of UAS that a remote pilot may operate, if appropriate; and

(d) details of the operator's policy on crew health requirements, including any procedures, guidance or references to ensure that the flight team are appropriately fit, capable and able to conduct the planned operations.

A.1.2.6 UAS configuration management

This section should describe how the operator manages changes to the UAS configuration.

A.1.2.7 Other position(s) and other information

Any other position defined in the organisation, or any other relevant information, should be provided.

A.1.3 Operations A.1.3.1 Type of operations

(a) Detailed description of the ConOps: the applicant should describe what types of operations the UAS operator intends to carry out. The detailed description should contain all the information needed to obtain a detailed understanding of how, where and under which limitations or conditions the operations shall be performed. The operational volume, including the ground and air risk buffers, needs to be clearly defined. Relevant charts/diagrams, and any other information helpful to visualise and understand the intended operation(s) should be included in this section.

(b) The applicant should provide specific details on the type of operations (e.g. VLOS, BVLOS), the population density to be overflown (e.g. away from people, sparsely populated, assemblies of people) and the type of airspace to be used (e.g. a segregated area, fully integrated).

(c) The applicant should describe the level of involvement (LoI) of the crew and any automated or autonomous systems during each phase of the flight.

A.1.3.2 Normal operation strategy

(a) The normal operation strategy should contain all the safety measures, such as technical or procedural measures, crew training, etc. that are put in place to ensure that the UAS can fulfil the operation within the approved limitations, and so that the operation remains in control.

(b) Within this section, it should be assumed that all systems are working normally and as intended.

(c) The intent of this chapter is to provide a clear understanding of how the operation takes place within the approved technical, environmental, and procedural limitations.

A.1.3.3 Standard operating procedures

This section should describe the standard operating procedures (SOP) applicable to all operations for which an approval is requested. A reference to the applicable operations manual (OM) is acceptable. Note: Checklists and SOP templates may be provided by the Authority or a qualified entity.

A.1.3.3.1 Normal operating procedures

This section should describe the normal operating procedures in place for the intended operations.

A.1.3.3.2 Contingency and emergency procedures

This section should describe the contingency procedures in place for any malfunction or abnormal operation, as well as an emergency.

A.1.3.3.3 Occurrence reporting procedures

UAS, like all aircraft, are subject to accident investigations and occurrence reporting schemes. Mandatory or voluntary reporting should be carried out using the reporting processes provided by the Authority. As a minimum, the SOP should contain:

(a) reporting procedures in case of:

(1) damage to property;

(2) a collision with another aircraft; or

(3) a serious or fatal injury (third parties and own personnel); and

(b) documentation and data logging procedures: describe how records and information are stored and made available, if required, to the accident investigation body, Authority, and other government entities (e.g. police) as applicable.

A.1.3.4 Operational limits

This section should detail the specific operating limitations and conditions appropriate to the proposed operation(s); for example, operating heights, horizontal distances, weather conditions, the applicable flight performance envelope, times of operations (day and/or night) and any limitations for operating within the applicable class(es) of airspace, etc.

A.1.3.5 Emergency response plan (ERP) The applicant should:

(a) define a response plan for use in the event of a loss of control of the operation;

(b) describe the procedures to limit the escalating effects of a crash; and

(c) describe the procedures for use in the event of a loss of containment.

A.1.4 Remote crew training A.1.4.1 General information

This section describes the processes and procedures that the UAS operator uses to develop and maintain the necessary competence for the remote crew (i.e. any person involved in the UAS operation).

A.1.4.2 Initial training and qualification

This section describes the processes and procedures that the UAS operator uses to ensure that the remote crew is suitably competent, and how the qualification of the remote crew is carried out.

A.1.4.3 Procedures for maintenance of currency

This section describes the processes and procedures that the UAS operator uses to ensure that the remote crew acquire and maintain the required currency to execute the various types of duties.

A.1.4.4 Flight simulation training devices (FSTDs) This section:

(a) describes the use of FSTDs for acquiring and maintaining the practical skills of the remote pilots (if applicable); and

(b) describes the conditions and restrictions in connection with such training (if applicable).

A.1.4.5 Training programme

This section provides a reference to the applicable training programme(s) for the remote crew.

A2 Guidance for the collection and presentation of technical relevant information

The aim of this section is to collect all the necessary technical information about the UAS and its supporting systems. This information needs to be sufficient to address the required robustness levels of the mitigations and the OSOs of the SORA.

The list below is suggested guidance for items which may be relevant for this assessment, but the items may differ, depending on the specific UAS utilised in this ConOps.

A.2.1 Reserved A.2.2 UAS description A.2.2.1 Unmanned aircraft (UA) segment A.2.2.1.1 Airframe

This section should include the following:

(a) A detailed description of the physical characteristics of the UA (mass, centre-of-mass, dimensions, etc.), including photos, diagrams and schematics, if appropriate to support the description of the UA.

(1) Dimensions: for fixed-wing UA, the wingspan, fuselage length, body diameter etc.; for a rotorcraft, the length, width and height, propeller diameter, etc.;

(2) Mass: all the relevant masses such as the empty mass, MTOM, .; and

(3) Centre of gravity: the centre of gravity and limits if necessary.

(b) Materials: the main materials used and where they are used in the UA, highlighting in particular any new materials (new metal alloys or composites) or combinations of materials (composites 'tailored' to designs).

(c) Load limits: the capability of the airframe structure to withstand expected flight load limits.

(d) Sub-systems: any sub-systems such as a hydraulic system, environmental control system, parachute, brakes, etc.

A.2.2.1.2 UA performance characteristics

This section should include the following:

(a) the performance of the UA within the proposed flight envelope, specifically addressing at least the following items:

(1) Performance: the

(i) maximum altitude;

(ii) maximum endurance;

(iii) maximum range;

(iv) maximum rate of climb;

(v) maximum rate of descent;

(vi) maximum bank angle; and (vii) turn rate limits.

(2) Airspeeds: the

(i) slowest speed attainable;

(ii) stall speed (if applicable);

(iii) nominal cruise speed; (iv) max cruise speed; and

(v) never-exceed airspeed.

(b) Any performance limitations due to environmental and meteorological conditions, specifically addressing the following items:

(1) wind speed limitations (headwind, crosswind, gusts);

(2) turbulence restrictions;

(3) rain, hail, snow, ash resistance or sensitivities;

(4) the minimum visibility conditions, if applicable;

(5) outside air temperature (OAT) limits; and

(6) in-flight icing:

(i) whether the proposed operating environment includes operations in icing conditions;

(ii) whether the system has an icing detection capability, and if so, what indications, if any, the system provides to the remote pilot, and/or how the system responds; and

(iii) any icing protection capability of the UA, including any test data that demonstrates the performance of the icing protection system.

A.2.2.1.3 Propulsion system

This section should include the following:

(a) Principle

A description of the propulsion system and its ability to provide reliable and sufficient power to take off, climb, and maintain flight at the expected mission altitudes.

(b) Fuel-powered propulsion systems

(1) The type (manufacturer organisation and model) of engine that is used;

(2) How many engines are installed;

(3) The type and the capacity of fuel that is used;

(4) How the engine performance is monitored;

(5) The status indicators, alerts (such as warning, caution and advisory), messages that are provided to the remote pilot;

(6) A description of the most critical propulsion-related failure modes/conditions and their impact on the operation of the system;

(7) How the UA responds, and the safeguards that are in place to mitigate the risk of a loss of engine power for each of the following:

(i) fuel starvation;

(ii) fuel contamination;

(iii) failed signal input from the remote pilot station (RPS); and

(iv) engine controller failure;

(8) The in-flight restart capabilities of the engine, if applicable, and if so, a description of the manual and/or automatic features of this capability;

(9) The fuel system and how it allows for adequate control of the fuel delivery to the engine, and provides for aircrew determination of the fuel remaining. This includes a system level diagram showing the location of the system in the UA and the fuel flow path; and

(10) How the fuel system is designed in terms of safety (fire detection and extinguishing, reduction of risk in case of impact, leak prevention, etc.).

(c) Electric-powered propulsion systems

(1) A high-level description of the electrical distribution architecture, including items such as regulators, switches, buses, and converters, as necessary;

(2) The type of motor that is used;

(3) The number of motors that are installed;

(4) The maximum continuous power output of the motor in watts;

(5) The maximum peak power output of the motor in watts;

(6) The current range of the motor in amps;

(7) Whether the propulsion system has a separate electrical source, and if not, how the power is managed with respect to the other systems of the UA;

(8) A description of the electrical system and how it distributes adequate power to meet the requirements of the receiving systems. This should include a system level diagram showing the electrical power distribution throughout the UA;

(9) How power is generated on board the UA (for example, generators, alternators, batteries).

(10) If a limited life power source such as batteries is used, the useful life of the power source during normal and emergency conditions, and how this was determined;

(11) How information on the battery status and the remaining battery capacity is provided to the remote pilot or the watchdog system;

(12) If available, a description of the source(s) of backup power for use in the event of a loss of the primary power source. This should include:

(i) the systems that are powered during backup power operation;

(ii) a description of any automatic or manual load shedding; and

(iii) how much operational time the backup power source provides, including the assumptions used to make this determination;

(13) How the performance of the propulsion system is monitored;

(14) The status indicators and alert (such as warning, caution and advisory) messages that are provided to the remote pilot;

(15) A description of the most critical propulsion-related failure modes/conditions and their impact on system operation;

(16) How the UA responds, and the safeguards that are in place to mitigate the risk of a propulsion system loss for each of the following:

(i) Low battery charge;

(ii) A failed signal input from the RPS; and

(iii) A motor controller failure;

(17) If the motor has in-flight reset capabilities, a description of the manual and/or automatic features of this capability.

(d) Other propulsion systems

A description of these systems to a level of detail equivalent to the fuel and electrical propulsions sections above.

A.2.2.1.4 Flight control surfaces and actuators

This section should include the following:

(a) A description of the design and operation of the flight control surfaces and servos/actuators, including a diagram showing the location of the control surfaces and the servos/actuators;

(b) A description of any potential failure modes and the corresponding mitigations;

(c) How the system responds to a servo/actuator failure; and

(d) How the remote-pilot or watchdog system is alerted of a servo/actuator malfunction.

A.2.2.1.5 Sensors

This section should describe the non-payload sensor equipment on board the UA and its role.

A.2.2.1.6 Payloads

This section should describe the payload equipment on board the UA, including all the payload configurations that significantly change the weight and balance, electrical loads, or flight dynamics.

A.2.3 UAS control segment

This section should include the following:

A.2.3.1 General

An overall system architecture diagram of the avionics architecture, including the location of all air data sensors, antennas, radios, and navigation equipment. A description of any redundant systems, if available.

A.2.3.2 Navigation

(a) How the UAS determines its location;

(b) How the UAS navigates to its intended destination;

(c) How the remote pilot responds to instructions from:

(1) air traffic control;

(2) UA observers or VOs (if applicable); and

(3) other crew members (if applicable);

(d) The procedures to test the altimeter navigation system (position, altitude);

(e) How the system identifies and responds to a loss of the primary means of navigation;

(f) A description of any backup means of navigation; and

(g) How the system responds to a loss of the secondary means of navigation, if available.

A.2.3.3 Autopilot

(a) How the autopilot system was developed, and the industry or regulatory standards that were used in the development process.

(b) If the autopilot is a commercial off-the-shelf (COTS) product, the type/design and the production organisation, with the criteria that were used in selecting the COTS autopilot.

(c) The procedures used to install the autopilot and how its correct installation is verified, with references to any documents or procedures provided by the manufacturer's organisation and/or developed by the UAS operator's organisation.

(d) If the autopilot employs input limit parameters to keep the aircraft within defined limits (structural, performance, flight envelope, etc.), a list of those limits and a description of how these limits were defined and validated.

(e) The type of testing and validation that was performed (software-in-the-loop (SITL) and hardware-in-the-loop (HITL) simulations).

A.2.3.4 Flight control system

(a) How the control surfaces (if any) respond to commands from the flight control computer/autopilot.

(b) A description of the flight modes (i.e. manual, artificial-stability, automatic, autonomous).

(c) Flight control computer/autopilot:

(1) If there are any auxiliary controls, how the flight control computer interfaces with the auxiliary controls, and how they are protected against unintended activation.

(2) A description of the flight control computer interfaces required to determine the flight status and to issue appropriate commands.

(3) The operating system on which the flight controls are based.

A.2.3.5 Remote pilot station (RPS)

(a) A description or a diagram of the RPS configuration, including screen captures of the control station displays.

(b) How accurately the remote pilot can determine the attitude, altitude (or height) and position of the UA.

(c) The accuracy of the transmission of critical parameters to other airspace users/air traffic control (ATC).

(d) The critical commands that are safeguarded from inadvertent activation and how that is achieved (for example, is there a two-step process to command 'switch the engine off'). The kinds of inadvertent input that the remote pilot could enter to cause an undesirable outcome (for example, accidentally hitting the 'kill engine' control in flight).

(e) Any other programmes that run concurrently on the ground control computer, and if there are any, the precautionary measures that are used to ensure that flight-critical processing will not be adversely affected.

(f) The provisions that are made against an RPS display or interface lock-up.

(g) The alerts (such as warning, caution and advisory) that the system provides to the remote pilot (e.g. low fuel or battery level, failure of critical systems, or operation out of control).

(h) A description of the means to provide power to the RPS, and redundancies, if any.

A.2.3.6 Detect and avoid (DAA) system

(a) Aircraft conflict avoidance

(1) A description of the system/equipment that is installed for collaborative conflict avoidance (e.g. SSR, TCAS, ADS-B, FLARM, etc.).

(2) If the equipment is qualified, details of the detailed qualification to the respective standard.

(3) If the equipment is not qualified, the criteria that were used in selecting the system.

(b) Non-collaborative conflict avoidance:

A description of the equipment that is installed (e.g. vision-based, PSR data, LIDAR, etc.).

(c) Obstacle conflict avoidance

A description of the system/equipment that is installed, if any, for obstacle collision avoidance.

(d) Avoidance of adverse weather conditions

A description of the system/equipment that is installed, if any, for the avoidance of adverse weather conditions.

(e) Standard

(1) If the equipment is qualified, a list of the detailed qualification to the respective standard.

(2) If the equipment is not qualified, the criteria that were used in selecting the system.

(f) A description of any interface between the conflict avoidance system and the flight control computer.

(g) A description of the principles that govern the installed DAA system

(h) A description of the role of the remote pilot or any other remote crew in the DAA system.

(i) A description of the known limitations of the DAA system.

A.2.4 Containment system

(a) A description of the principles of the system/equipment used to perform containment functions for:

(1) avoidance of specific area(s) or volume(s); or

(2) confinement in a given area or volume.

(b) The system information and, if applicable, supporting evidence that demonstrates the reliability of the containment system.

A.2.5 Ground support equipment (GSE) segment

(a) A description of all the support equipment that is used on the ground, such as launch or recovery systems, generators, and power supplies.

(b) A description of the standard equipment available, and the backup or emergency equipment.

(c) A description of how the UAS is transported on the ground.

A.2.6 Command and control (C2) link segment

(a) The standard(s) with which the system is compliant.

(b) A detailed diagram that shows the system architecture of the C2 link, including informational or data flows and the performance of the subsystem, and values for the data rates and latencies, if known.

(c) A description of the control link(s) connecting the UA to the RPS and any other ground systems or infrastructures, if applicable, specifically addressing the following items:

(1) The spectrum that will be used for the control link and how the use of this spectrum has been coordinated. If approval of the

spectrum is not required, the regulation that was used to authorise the frequency.

(2) The type of signal processing and/or link security (i.e. encryption) that is employed.

(3) The datalink margin in terms of the overall link bandwidth at the maximum anticipated distance from the RPS, and how it was determined.

(4) If there is a radio signal strength and/or health indicator or similar display to the remote pilot, how the signal strength and health values were determined, and the threshold values that represent a critically degraded signal.

(5) If the system employs redundant and/or independent control links, how different the design is, and the likely common failure modes.

(6) For satellite links, an estimate of the latencies associated with using the satellite link for aircraft control and for air traffic control communications.

(7) The design characteristics that prevent or mitigate the loss of the datalink due to the following:

(i) RF or other interference;

(ii) flight beyond the communications range;

(iii) antenna masking (during turns and/or at high attitude angles);

(iv) a loss of functionality of the RPS;

(v) a loss of functionality of the UA; and

(vi) atmospheric attenuation, including precipitation.

A.2.7 C2 link degradation

A description of the system functions in case of a C2 link degradation:

(a) Whether the C2 link degradation status is available and in what form (e.g. degraded, critical, automatic messages).

(b) How the status of the C2 link degradation is announced to the remote pilot (e.g. visual, haptic, or sound).

A description of the associated contingency procedures.

(c) Other.

A.2.8 C2 link loss

(a) The conditions that could lead to a loss of the C2 link.

(b) The measures in case of a loss of the C2 link.

(c) A description of the clear and distinct aural and visual alerts to the remote pilot for any case of a lost link.

(d) A description of the established lost link strategy presented in the UAS operating manual, taking into account the emergency recovery capability.

(e) A description of how the geo-awareness or geo-fencing system is used in this case, if available.

(f) The lost link strategy, and, if incorporated, the re-acquisition process in order to try to re-establish the link in a reasonably short time.

A.2.9. Safety features

(a) A description of the single failure modes and their recovery mode(s), if any.

(b) A description of the emergency recovery capability to prevent risks to third-parties. This typically consists of:

(1) a flight termination system (FTS), procedure or function that aims to immediately end the flight; or

(2) an automatic recovery system (ARS) that is implemented through UAS crew command or by the on board systems. This may include an automatic pre-programmed course of action to reach a predefined and unpopulated forced landing area; or

(3) any combination of the above, or other methods.

(c) The applicant should provide both a functional and physical diagram of the global UA system with a clear depiction of its constituent components, and, where applicable, an indication of its peculiar features (e.g. independent power supplies, redundancies, etc.)

Annex B to AMC1 to Article 11

INTEGRITY AND ASSURANCE LEVELS FOR THE MITIGATIONS USED TO REDUCE THE INTRINSIC GROUND RISK CLASS (GRC)

B.1 How to use Annex B

The following Table B-1 provides the basic principles to consider when using SORA Annex B.

	Principle description	Additional information
#1	Annex B provides assessment criteria for the integrity (i.e. safety gain) and assurance (i.e. method of proof) of the applicant's proposed mitigations. The proposed mitigations are intended to reduce the intrinsic ground risk class (GRC) associated with a given operation.	The identification of mitigations is the responsibility of the applicant.
#2	Annex B does not cover the LoI of the Authority. The LoI is based on the Authority's assessment of the applicant's ability to perform the given operation.	
#3	A proposed mitigation may or may not have a positive effect in reducing the ground risk associated with a given operation. In the case where a mitigation is available but does not reduce the risk on the ground, its level of integrity should be considered equivalent to 'None'.	
#4	To achieve a given level of integrity/assurance, when more than one criterion exists for that level of integrity/assurance, all the applicable criteria need to be met.	
#5	Annex B intentionally uses non-prescriptive terms (e.g. suitable, reasonably practicable) to provide flexibility to both the applicant and the authorities. This does not constrain the applicant in proposing mitigations, nor the Authority in evaluating what is needed on a case by-case basis.	
#6	This annex in its entirety also applies to single-person organisations.	

Table B.1 – Basic principles

B.2 M1 — Strategic mitigations for ground risk

M1 mitigations are 'strategic mitigations' intended to reduce the number of people at risk on the ground. To assess the integrity levels of M1 mitigations, the following need to be considered:

(a) the definition of the ground risk buffer and the resulting ground footprint; and

(b) the evaluation of the people at risk.

With the exception of the specific case of a 'tether' provided in the following paragraph (2), the generic criteria to assess the level of integrity (Table B.2) and level of assurance (Table B.3) of the M1 type ground risk mitigations are provided in following paragraph (1).

(1) Generic criteria

		Level of integrity		
		Low	**Medium**	**High**
M1 — Strategic mitigations for ground risk	Criterion #1 (Definition of the ground risk buffer)	A ground risk buffer with at least a 1:1 rule[1] or for rotary wing UA defined using a ballistic methodology approach acceptable to the Authority.	The ground risk buffer takes into consideration: (a) improbable[2] single malfunctions or failures (including the projection of high energy parts such as rotors and propellers) which would lead to an operation outside the operational volume; (b) meteorological conditions (e.g. wind); (c) UAS latencies (e.g. latencies that affect the timely manoeuvrability of the UA); (d) UA behaviour when activating a technical containment measure; and (e) UA performance.	Same as medium[3]
	Comments	*[1] If the UA is planned to operate at an altitude of 150 m, the ground risk buffer should be a minimum of 150 m.*	*[2] For the purpose of this assessment, the term 'improbable' should be interpreted in a qualitative way as 'Unlikely to occur in each UAS during its total life, but which may occur several times when considering the total operational life of a number of UAS of this type'. [3] The distinction between a medium and a high level of robustness for this criterion is achieved through the level of assurance (Table 3 below).*	
	Criterion #2 (Evaluation of people at risk)	The applicant evaluates the area of operations by means of on-site inspections or appropriate appraisals to justify lowering the density of the people at risk (e.g. a residential area during daytime when some people may not be present or an industrial area at night time for the same reason).	The applicant evaluates the area of operations by use of authoritative density data (e.g. data from the U-space data service provider) relevant for the proposed area and time of operation to substantiate a lower density of people at risk. If the applicant claims a reduction, due to a sheltered operational environment, the applicant: (a) uses a UA of less than 25 kg and not flying above 174 knots[4], and (b) demonstrates that although the operation is conducted in a populated environment, it is reasonable to consider that most of the non-involved persons will be located within a building[5].	Same as medium.

	Comments	*N/A*	*[4] as per MITRE presentation given during the UAS Technical Analysis and Applications Center (TAAC) conference in 2016 titled 'UAS EXCOM Science and Research Panel (SARP) 2016 TAAC Update' - PR 16-3979* *[5] The consideration of this mitigation may vary based on the local conditions.*	*N/A*

Table B.2 — Level of integrity assessment criteria for ground risk of non-tethered M1 mitigations

		Level of assurance		
		Low	**Medium**	**High**
M1 — Strategic mitigations for ground risk	Criterion #1 (Definition of the ground risk buffer)	The applicant declares that the required level of integrity is achieved[1].	The applicant has supporting evidence to claim that the required level of integrity has been achieved. This is typically done by means of testing, analysis, simulation[2], inspection, design review or through operational experience.	The claimed level of integrity is validated by the Authority of the MS or by an entity that is designated by the Authority.
	Comments	*[1] Supporting evidence may or may not be available.*	*[2] When simulation is used, the validity of the targeted environment used in the simulation needs to be justified.*	*N/A*
	Criterion #2 (Evaluation of people at risk)	The applicant declares that the required level of integrity has been achieved[3].	The density data used for the claim of risk reduction is an average density map for the date/time of the operation from a static sourcing (e.g. census data for night time ops). In addition, for localised operations (e.g. intra-city delivery or infrastructure inspection), the applicant submits the proposed route/area of operation to the applicable authority (e.g. city police, office of civil protection, infrastructure owner etc.) to verify the claim of a reduced number of people at risk.	Same as medium; however, the density data used for the claim of risk reduction is a near-real time density map from a dynamic sourcing (e.g. cellular user data) and applicable for the date/time of the operation.
	Comments	*[3] Supporting evidence may or may not be available*	*N/A*	*N/A*

Table B.3 — Level of assurance assessment criteria for ground risk of non-tethered M1 mitigations

(2) Specific criteria in case of use of a tether to reduce people at risk

When an applicant wants to take credit for a tether to justify a reduction in the number of people at risk:

(a) the tether needs to be considered part of the UAS and assessed based on the criteria below, and

(b) potential hazards created by the tether itself should be addressed through the OSOs defined in Annex E.

The level of integrity criteria for a tethered mitigation is found in Table B.4. The level of assurance for a tethered mitigation is found in Table B.5.

		Level of integrity		
		Low	**Medium**	**High**
M1 — Tethered operation	Criterion #1 (Technical design)	Does not meet the 'medium' level criteria	(a) The length of the line is adequate to contain the UA in the operational volume and reduce the number of people at risk. (b) The strength of the line is compatible with the ultimate loads[1] expected during the operation. (c) The strength of the attachment points is compatible with the ultimate loads[1] expected during the operation. (d) The tether cannot be cut by the rotating propellers.	Same as medium[2]
	Comments	*N/A*	*[1] Ultimate loads are identified as the maximum loads to be expected in service, including all the possible nominal and failure scenarios multiplied by a 1.5 safety factor. [2] The distinction between a medium and a high level of robustness for this criterion is achieved through the level of assurance (Table B.5 below).*	
	Criterion #2 (Procedures)	Does not meet the 'medium' level criteria	The applicant has procedures to install and periodically inspect the condition of the tether.	Same as medium[3]
	Comments	*N/A*	*[3] The distinction between a medium and a high level of robustness for this criterion is achieved through the level of assurance (Table B.5 below).*	

Table B.4 — Level of integrity assessment criteria for ground risk tethered M1 mitigations

	Level of assurance		
	Low	**Medium**	**High**

M1 — Tethered operation	Criterion #1 (Technical design)	Does not meet the 'medium' level criteria	The applicant has supporting evidence (including the specifications of the tether material) to claim that the required level of integrity is achieved. (a) This is typically achieved through testing or operational experience. (b) Tests can be based on simulations; however, the validity of the target environment used in the simulation needs to be justified.	The claimed level of integrity is validated by the Authority of the MS or by an entity that is designated by the Authority.
	Comments	*N/A*	*N/A*	*N/A*
	Criterion #2 (Procedures)	(a) Procedures do not require validation against either a standard or a means of compliance considered adequate by the competent	(a) Procedures are validated against standards considered adequate by the Authority of the MS and/or in accordance with the means of compliance acceptable to that authority[1]. (b) The adequacy of the procedures is proven through:	Same as medium. In addition: (a) Flight tests performed to validate the procedures cover the complete flight envelope or are proven to be conservative.
		authority of the MS. (b) The adequacy of the procedures and checklists is declared.	(1) dedicated flight tests; or (2) simulation, provided that the representativeness of the simulation means is proven to be valid for the intended purpose with positive results; or (3) any other means acceptable to the Authority of the MS.	(b) The procedures, flight tests and simulations are validated by the Authority or by an entity that is designated by the Authority.
	Comments	*N/A*	[1] *AMC2 UAS.SPEC.030(3)(e) (Operational procedures for medium and high levels of robustness) is considered an acceptable means of compliance.*	*N/A*

Table B.5 — Level of assurance assessment criteria for ground risk tethered M1 mitigations

B.3 M2 — Effects of ground impact are reduced

M2 mitigations are intended to reduce the effect of ground impact once the control of the operation is lost. This is done by reducing the effect of the UA impact dynamics (i.e. the area, energy, impulse, transfer energy, etc.). One example would be the use of a parachute.

		Level of integrity		
		Low/None	**Medium**	**High**
M2 — Effects of UA impact dynamics are reduced (e.g. parachute)	Criterion #1 (Technical design)	Does not meet the 'medium' level criterion	(a) Effects of impact dynamics and post impact hazards[1] are significantly reduced although it can be assumed that a fatality may still occur. (b) When applicable, in case of malfunctions, failures or any combinations thereof that may lead to a crash, the UAS contains all the elements required for the activation of the mitigation. (c) When applicable, any failure or malfunction of the proposed mitigation itself (e.g. inadvertent activation) does not adversely affect the safety of the operation.	Same as medium. In addition: (a) When applicable, the activation of the mitigation is automated[2]. (b) The effects of impact dynamics and post impact hazards are reduced to a level where it can be reasonably assumed that a fatality will not occur[3].
	Comments	*N/A*	*[1] Examples of post impact hazards include fires and the release of highenergy parts.*	*[2] The applicant retains the discretion to implement an additional manual activation function. [3] Emerging research and upcoming industry standards will help applicants to substantiate compliance with this integrity criterion.*
	Criterion #2 (Procedures, if applicable)	Any equipment used to reduce the effect of the UA impact dynamics is installed and maintained in accordance with the manufacturer's instructions.[4]		
	Comments / Notes	*[4] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (Table B.7 below).*		
	Criterion #3 (Training, if applicable)	Personnel responsible for the installation and maintenance of the measures proposed to reduce the effect of the UA impact dynamics are identified and trained by the applicant.[5]		
	Comments / Notes	*[5] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (Table B.7 below).*		

Table B.6 — Level of integrity assessment criteria for M2 mitigations

		Level of assurance		
		Low/None	**Medium**	**High**
M2 — Effects of UA impact dynamics are reduced (e.g. parachute)	Criterion #1 (Technical design)	The applicant declares that the required level of integrity has been achieved[1].	The applicant has supporting evidence to claim that the required level of integrity is achieved. This is typically[2] done by means of testing, analysis, simulation[3], inspection, design review or through operational experience. The applicant may declare compliance with MoC to LightUAS.2512[4] providing the supporting evidence defined in it.	The competent authority should request the applicant to use a UAS for which EASA has verified the claimed integrity through a DVR.
	Comments	*[1] Supporting evidence may or may not be available.*	*[2] The use of industry standards is encouraged when developing mitigations used to reduce the effect of ground impact. [3] When simulation is used, the validity of the targeted environment used in the simulation needs to be justified.* *[4] https://www.easa.europa.eu/ en/document-library/productcertificationconsultations/meanscompliance-mitigation-meansm2-ref-amc*	
	Criterion #2 (Procedures, if applicable)	(a) Procedures do not require validation against either a standard or a means of compliance considered adequate by the competent authority of the MS. (b) The adequacy of the procedures	(a) Procedures are validated against standards considered adequate by the competent authority of the MS and/or in accordance with the means of compliance acceptable to that authority[1]. (b) The adequacy of the procedures is proven through: (1) dedicated flight tests; or (2) simulation, provided that the representativeness of the simulation means is proven to be valid for the intended	Same as medium. In addition: (a) Flight tests performed to validate the procedures cover the complete flight envelope or are proven to be conservative. (b) The procedure

		and checklists is declared.	purpose with positive results; or (3) any other means acceptable to the competent authority of the MS	that is designated by the competent authority.
	Comments	*N/A*	*[1] AMC2 UAS.SPEC.030(3)(e) (Operational procedures for medium and high levels of robustness) is considered an acceptable means of compliance.*	*N/A*
	Criterion #3 (Training, if applicable)	Training is selfdeclared (with evidence available)	(a) Training syllabus is available. (b) The UAS operator provides competency-based, theoretical and practical training.	(a) Training syllabus is validated by the competent authority of the MS or by an entity that is designated by the competent authority. (b) Remote crew competencies are verified by the competent authority of the MS or by an entity that is designated by the competent authority.
	Comments	*N/A*	*N/A*	*N/A*

Table B.7 — Level of assurance assessment criteria for M2 mitigations

B.4 M3 — An ERP is in place, UAS operator validated and effective

An ERP should be defined by the applicant in the event of a loss of control of the operation (*). These are emergency situations where the operation is in an unrecoverable state and in which:

(a) the outcome of the situation relies highly on providence; or

(b) it could not be handled by a contingency procedure; or

(c) when there is a grave and imminent danger of fatalities.

The ERP proposed by an applicant is different from the emergency procedures. The ERP is expected to cover:

(1) a plan to limit the escalating effect of a crash (e.g. to notify first responders), and

(2) the conditions to alert ATM.

(*) Refer to the SORA semantic model (Figure 1) in the main body.

		Level of integrity		
		Low/None	**Medium**	**High**
M3 — An ERP is in place, UAS operator validated and effective	Criteria	No ERP is available, or the ERP does not cover the elements identified to meet a 'medium' or 'high' level of integrity	The ERP: (a) is suitable for the situation; (b) limits the escalating effects; (c) defines criteria to identify an emergency situation; (d) is practical to use; (e) clearly delineates the duties of remote crew member(s).	Same as medium. In addition, in case of a loss of control of the operation, the ERP is shown to significantly reduce the number of people at risk, although it can be assumed that a fatality may still occur.
	Comments	*N/A*	*N/A*	*N/A*

Table B.8 — Level of integrity assessment criteria for M3 mitigations

		Level of assurance		
		Low/None	**Medium**	**High**
M3 — An ERP is in place, UAS operator validated and effective	Criterion #1 (Procedures)	(a) Procedures do not require validation against either a standard or a means of compliance considered adequate by the Authority of the MS. (b) The adequacy of the procedures and checklists is declared.	(a) The ERP is developed to standards considered adequate by the Authority or in accordance with means of compliance acceptable to that authority[1]. (b) The ERP is validated through a representative tabletop exercise[2] consistent with the ERP training syllabus.	Same as medium. In addition: (a) The ERP and the effectiveness of the plan with respect to limiting the number of people at risk are validated by the Authority or by an entity that is designated by the Authority. (b) The applicant has coordinated and agreed the ERP with all third parties identified in the plan. (c) The representativeness of the tabletop exercise is validated by the Authority or by an entity that is designated by the Authority.

	Comments	*N/A*	*[1] AMC3 UAS.SPEC.030(3)(e) (ERP for medium and high*	*N/A*
		Level of assurance		
		Low/None	**Medium**	**High**
			level of robustness) is considered an acceptable means of compliance. [2] The tabletop exercise may or may not involve all third parties identified in the ERP.	
	Criterion #2 (Training)	Does not meet the 'medium' level criterion	(a) An ERP training syllabus is available. (b) A record of the ERP training completed by the relevant staff is established and kept up to date.	Same as medium. In addition, the competencies of the relevant staff are verified by the Authority or by an entity that is designated by the Authority.
	Comments	*N/A*	*N/A*	*N/A*

Table B.9 — Level of assurance assessment criteria for M3 mitigations

Annex C to AMC1 to Article 11

STRATEGIC MITIGATION — COLLISION RISK ASSESSMENT

C.1 Introduction — air risk strategic mitigations

The target audience for this Subpart is the UAS operator who wishes to demonstrate to the Authority that the risk of a mid-air collision in the operational volume is acceptably safe, and to obtain, with concurrence from the ANSP, approval to operate in the particular airspace.

More particularly, this Subpart covers the process of how the UAS operator justifies lowering the initial assessment of the ARC.

The air risk model provides a holistic means to assess the risk of an encounter with manned aircraft. This provides guidance to both the UAS operator and the Authority on determining whether an operation can be conducted in a safe manner. The model does not provide answers to all the air risk challenges, and should not be used as a checklist. This guidance provides the UAS operator with suitable mitigation means and thereby reduces the air risk to an acceptable level. This guidance does not contain prescriptive requirements, but rather a set of objectives at various levels of robustness.

C.2 Principles

The SORA is only used to establish an initial ARC for an operational volume when the Authority has not already established one. The initial ARC is a

generalised qualitative classification of the rate at which a UAS would encounter a manned aircraft in the operational volume. A residual ARC is the classification after mitigations are applied. The UAS operational volume may have collision risk levels that differ from the generalised initial ARC level. If this is assumed to be the case, this Subpart provides a process to help the UAS operator and the Authority work to lower the initial ARC through the application of strategic mitigations.

C.3 Air risk scope and assumptions

The scope of this air risk assessment is designed to help the UAS operator and the Authority in determining the risk of a collision with manned aircraft which are operated under the 'specific' category. The scope of the air risk assessment does not include:

(a) the probability of UAS on UAS encounters; or

(b) risks due to wake turbulence, adverse weather, controlled flight into terrain, return-to course functions, a lost link, or an automatic response.

C.3.1 SORA qualitative vs quantitative approach

This air risk assessment is qualitative in nature. Where possible, this assessment will use quantitative data to back up and support the qualitative assumptions. The SORA approach in general provides a balance between qualitative and quantitative approaches, as well as between known prescriptive and non-traditional methodologies.

C.3.2 SORA U-space assumptions

The SORA has used U-space mitigations to a limited extent, because U-space is in the early stages of development. When U-space provides adequate mitigations to limit the risk of UAS encounters with manned aircraft, a UAS operator can apply for, and obtain credit for these mitigations, whether they are tactical or strategic.

C.3.3 SORA flight rules assumptions

Today, UAS flight operations under the 'specific' category cannot fully comply with the IFR and VFR rules as written. Although IFR infrastructures and mitigations are designed for manned aircraft operations (e.g. minimal safe altitudes, equipage requirements, operational restrictions, etc.), it may be possible for a UAS to comply with the IFR requirements. UAS operating at very low levels (e.g. operational volume's ceiling below 150m (~500 ft) AGL) may technically comply with the IFR requirements, but the IFR infrastructure was not designed with that airspace in mind; therefore, mitigations for this airspace would be derived, and would be highly impractical and inefficient. When operating BVLOS, a UAS cannot comply with VFR.

Given the above, for the purposes of this risk assessment, it is assumed that the Authority will address these shortcomings. All aircraft must adhere to specific flight rules to mitigate the collision risk, in accordance with Civil Aviation

Regulations 2007. The implementation of procedures and guidelines appropriate to the airspace structure reduces the collision risk for all aircraft. For instance, there are equipment requirements established for the airspace requested and requirements associated with day-night operations, pilot training, airworthiness, lighting requirements, altimetry requirements, airspace restrictions, altitude restrictions, etc. These rules must still be addressed by the Authority.

The Authority is responsible for defining the airspace structures in accordance with the Civil Aviation Regulations 2007, in addition, as required in Regulation 18 of the Civil Aviation (Unmanned Aircraft System) Regulation, the Authority will define the geographical zones for UAS operators. The Authority, when defining the airspace structure, considers the traffic type and complexity and defines the airspace classes and services being provided in accordance with the Civil Aviation Regulations. This information, which can be published either in the aeronautical information publication (AIP) or any other aeronautical publication, can be used by the UAS operator to identify the initial air risk. The SORA air risk model is a tool to assess the risks associated with UAS operations in a particular volume of airspace, and a method to determine whether those risks are within acceptable safety limits.

C.3.4 Regulatory requirements, safety requirements, and waivers

The SERA Regulation requires all aircraft, manned and UAS, to ‘remain well clear from and avoid collisions with’ other manned aircraft. The UAS is unable to ‘see and avoid’, therefore, it must employ an alternate means of compliance to meet the intent of ‘see and avoid’, which will have to be defined in terms of safety and performance for the UAS operation. When the risk of an encounter with manned aircraft is extremely low (i.e. in atypical/segregated airspace), an alternate means of compliance may not be required. For example, in areas where the manned airspace density is so low, (e.g. in the case of low-level operations in remote parts of Alaska or northern Sweden), the airspace safety threshold could be met with no additional mitigation. UAS operators need to understand that although the airspace may be technically safe to fly in from an air collision risk standpoint, it does not fulfil the ICAO Annex 2, Section 3.2 ’See and Avoid’ requirements.

To operate a UAS in manned airspace, two requirements must be met:

(a) A safety requirement that ensures that the operation is safe to conduct in the operational volume; and

(b) A requirement for compliance with point SERA.3201 of the SERA Regulation to ‘see and avoid’.

These requirements must be addressed to the Authority through either:

(1) demonstration of compliance with both requirements;

(2) demonstration of an alternate means of compliance with the requirements; or

(3) a waiver of the requirement(s) by the Authority.

The SORA provides a means to assess whether the air risks associated with UAS operations is within acceptable limits.

C.3.5 SORA assumptions on threat aircraft

This air risk assessment does not consider the ability of the threat aircraft to remain well clear from or to avoid collisions with the UAS in any part of the safety assessment.

C.3.6 SORA assumptions on people-carrying UAS

This air risk model does not consider the notion of UAS carrying people, or urban mobility operations. The model and the assessment criteria are limited to the risk of an encounter with manned aircraft, i.e. an aircraft piloted by a human on board.

C.3.7 SORA assumptions on UAS lethality

This air risk assessment assumes that a mid-air collision between a UAS and manned aircraft is catastrophic. Frangibility is not considered.

C.3.8 SORA assertion on tactical mitigations

The SORA model makes no distinction between separation provision and collision avoidance but treats them as one dependent system performing a continuous function, whose goals and objectives change over time. This continuum starts with an encounter and progresses to a near mid-air collision objective as the pilot and/or the detect and avoid system of the UA negotiate(s) the encounter. The use of the term ‘tactical mitigation’ should therefore not be confused with the provisioning of (tactical) separation services referred to in ICAO Doc 9854.

C.4 General air-SORA mitigation overview

SORA classification of mitigations

The SORA classifies mitigations to suit the operational needs of a UAS in the ‘specific’ class. These mitigations are classified as:

(a) strategic mitigations by the application of operational restrictions; (b) strategic mitigations by the application of common structures and rules; and (c) tactical mitigations.

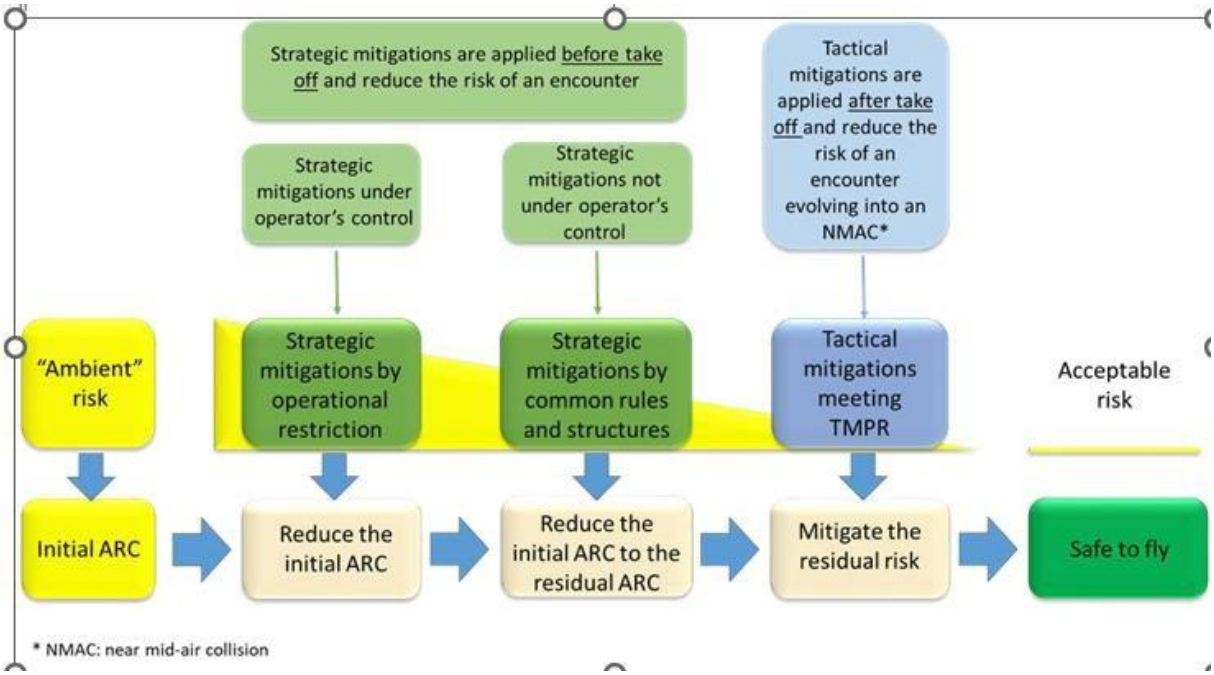


Figure C.5 — SORA air conflict mitigation process

C.5 Air risk strategic mitigation

Strategic mitigation consists of procedures and operational restrictions intended to reduce the UAS encounter rates or the time of exposure, prior to take-off.

Strategic mitigations are further divided into:

(a) mitigations by operational restrictions which are mitigations that are controlled by the UAS operator; and

(b) mitigations by common structures and rules which are mitigations which cannot be controlled by the UAS operator.

C.5.1 Strategic mitigation by operational restrictions

Operational restrictions are controlled by the UAS operator and are intended to mitigate the risk of a collision prior to take-off. This section provides details on operational restrictions, and examples of how these can be applied to UAS operations.

Operational restrictions are the primary means that a UAS operator can apply to reduce the risk of collision using strategic mitigation(s). The most common mitigations by operational restriction are:

(a) mitigation(s) that bound the geographical volume in which the UAS operates (e.g. certain boundaries or airspace volumes); and

(b) mitigation(s) that bound the operational time frame (e.g. restricted to certain times of day, such as flying only at night).

In addition to the above, another approach to limit exposure to risk is to limit the exposure time. This is called ‘mitigation by exposure’. Mitigation by exposure simply limits the time of exposure to the operational risk.

Mitigations that limit the flight time or the exposure time to risk may be more difficult to apply. With this said, there is some precedence for this mitigation, which has (in some cases) been accepted by the Authority. Therefore, even though it is considered to be difficult, this mitigation strategy may be considered.

One example is the minimum equipment list (MEL) system, which allows, in certain situations, a commercial airline to fly for three to ten days with an inoperative traffic collision avoidance system (TCAS). The safety argument is that three days is a very short exposure time compared with the total life-time risk exposure of the aircraft. This short time of elevated risk exposure is justified to allow the aircraft to return to a location where proper equipment maintenance can take place. While appreciating that this may be a difficult argument for the UAS operation to make, the UAS operator is still free to pursue this line of reasoning for a reduction in the risk of collision by applying a time of exposure argument.

C.5.1.1. Example of operational restriction by geographical boundary

The UAS operator intends to fly in a Class B airport airspace. The Class B airspace, as a whole, has a very high encounter rate. However, the UAS operator wishes to operate at a very low altitude and at the very outer reaches of the Class B airspace where manned aircraft do not routinely fly. The UAS operator draws up a new operational volume at the outer edge of the class B airspace and demonstrates that operations within the new Class B volume have very low encounter rates.

The UAS operator may approach this scenario by requesting the Authority to more precisely define the airport environment from the SORA perspective. The UAS operator then considers the newly defined airport environment, and provides an operational restriction that allows the UAS operation to safely remain inside the class B airspace, but outside the newly defined SORA airport environment.

C.5.1.2 Example of operational restriction by time limitations

The UAS operator wishes to fly in a Class B airport airspace. The Class B airspace, as a whole, has a very high encounter rate. However, the UAS operator wishes to operate at a time of day when manned aircraft do not routinely fly. The UAS operator then restricts the time schedule of the UAS operation and demonstrates that the new time (e.g. 03:00 / 3 AM and still within Class B) has very low encounter rates and is safe for operation.

C.5.1.3 Example of operational restriction by time of exposure

The UAS operator wishes to cut the corner of a Class B airspace for flight efficiency. The UAS operator demonstrates that even though the Class B

airspace has a high encounter rate, the UAS is only exposed to that higher rate for a very short amount of time as it transitions the corner.

C.5.2 Strategic mitigation by common structures and rules

Strategic mitigation by common structures and rules requires all aircraft within a certain class of airspace to follow the same structures and rules; these structures and rules work to lower the risk of collision within the airspace. In accordance with the SERA Regulation, all aircraft in that airspace must participate, and only the competent authorities have the authority to set requirements for those aircraft, while the ANSP and ATCO provide instructions. The UAS operator does not have control over the existence or level of participation of the airspace structure or the application of the flight rules. Therefore, strategic mitigation by common structures and rules is applied by the competent authorities. These should be made available to the UAS operator through the geographical zones, defined in accordance with Article 15 of the UAS Regulation.

For example, imagine the situation if individual drivers could create their own driving rules to cover their direction, lanes, boundaries and speed. If the driving rules were different from one driver to another, no safety benefit would be gained, even though they were all following rules (their own), and total chaos would ensue. However, if all drivers were compelled to follow the same set of rules, then the traffic flow would be orderly, with increased safety for all drivers. This is why a UAS operator cannot propose a mitigation schema requiring participation from other airspace users that differs from that required by the Authority.

Most strategic mitigations by common structures and rules will take the form of:

(a) common flight rules; and

(b) common airspace structures.

Strategic mitigations by common flight rules is accomplished by setting a common set of rules which all airspace users must comply with. These rules reduce air conflicts and/or make conflict resolution easier. Examples of common flight rules that reduce the collision risk include right of way rules, implicit and explicit coordination schemes, conspicuity requirements, cooperative identification system, etc.

Strategic mitigation by using a common airspace structure is accomplished by controlling the airspace infrastructure through physical characteristics, procedures, and techniques that reduce conflicts or make conflict resolution easier. Examples of common flight airspace structures which reduce the risk of collision are airways, departure and approach procedures, airflow management, etc.

In the future, as U-space structures and rules become more readily defined and adopted, they will provide a source for the strategic mitigation of UAS

operations by common structures and rules that UAS operators could more easily apply.

C.5.2.1 Example of mitigation by common flight rules

The UAS operator intends to fly in a volume of airspace in which the Authority requires all UAS to be equipped with an electronic cooperative system and anti-collision lighting. The rules further require the UAS operator to file a flight plan with the designated ANSP/U-space service providers, and check for potential hazards along the whole flight route. The operator complies with these requirements and installs anti-collision lights and a Mode-S Transponder. The operator further agrees to file a flight plan prior to each flight. These rules enhance the safety of the flight in the same way as a notice to airmen (NOTAM). The UAS operator should also have a system in place to check for high airspace usage in the intended operational volume (e.g. a glider competition or a fly-in). In those situations where the UAS operator does not own the airspace in which the operational volume exists, the rules require the UAS operator to request permission prior to entering that airspace.

C.5.2.2. Examples of mitigation by common airspace structure

Example 1: The Authority establishes a transit corridor through Class B airspace that keeps the UAS separated from other non-UAS airport traffic, and safely separates the corridor traffic in one direction from the traffic in the other direction. The UAS operator intends to fly through this Class B airport airspace, and hence must stay within the established transit corridor and adhere to the transit corridor rules.

Example 2: The UAS operator intends to fly a UAS from one location to another, and files a flight plan with a U-space service provider or the procedural separation system. As the UAS takes off, the U-space service provider then guarantees separation by procedural control of all the aircraft in the airspace. Procedural controls are the take-off windows, reporting points, assigned airways and altitudes, route clearances, etc. required for safe operation.

C.6 Reducing the initial air risk class (ARC) assignment (optional)

This section is intended for an applicant that intends to use strategic mitigations to reduce the collision risk (i.e. ARC). There are two types of ARC:

(a) the initial ARC, which is a qualitative classification of a UAS operational collision risk within an operational volume before strategic mitigations are applied; and

(b) the residual ARC, which is a qualitative classification of a UAS operational collision risk in an operational volume after all strategic mitigations are applied.

If a UAS operator agrees that the (generalised) initial ARC applicable to their operation and operational volume is correct, then this step is not necessary, and the assessment should continue at SORA Step #6 (assigning the DAA

tactical performance requirement and robustness levels based on the residual collision risk).

If mitigations to reduce the ARC are relevant and are proposed, this section provides information and examples of how to use strategic mitigation(s) to lower the collision risk within the operational volume, and demonstrate the strategy to the Authority. The examples within the SORA may or may not be applicable or acceptable to the Authority; however, the SORA encourages an open dialogue between the applicant and the Authority to determine what is acceptable evidence.

C.6.1 Lowering the initial ARC to the residual ARC-a in any operational volume (optional)

ARC-a is intended for operations in atypical/segregated airspace (see Table C.1). Lowering the initial ARC to residual ARC-a requires a higher level of safety verification because it allows a UAS operator to operate without any tactical mitigation.

To demonstrate that an operation could be reduced to a residual ARC-a, the UAS operator should demonstrate:

(a) that the operational volume can meet the requirements of SORA atypical/segregated airspace; and

(b) compliance with any other requirements mandated by the Authority for the intended operational volume.

A residual ARC-a assessment does necessarily exempt the UAS operator from the requirements to ‘see and avoid’ and to ‘remain well clear from’ other aircraft. If the designated Authority allows the UAS operator a residual ARC-a assessment for the operational volume, in order to comply with the SERA Regulation, the UAS operator must either provide a valid means and equipment as an alternate means of compliance for the ‘see and avoid’ requirement, or the Authority must waive the requirement to ‘see and avoid’ and ‘remain well clear.’

C.6.2 Lowering the initial ARC using operational restrictions (optional)

There may be many methods by which a UAS operator may wish to demonstrate a suitable air risk and strategic mitigations. The SORA does not dictate how this is achieved, and instead, allows the applicant to propose and demonstrate the suitability and effectiveness of their strategic mitigations. It is important for both the UAS operator and the Authority to understand that the assessment may be qualitative in nature, and where possible, augmented with quantitative data to support the qualitative assumptions and decisions. The UAS operator and the Authority should understand there may not be a clear delineation of the decision points, so common sense and the safety of manned aircraft should be of paramount consideration.

The SORA provides a two-step method to reduce the air risk by operational mitigation. The first step is to determine the initial ARC by using the potential

air risk encounter rate based on known airspace densities (as per Table C.1). The second step is to reduce the initial risk through UAS operator-provided evidence that demonstrates that the intended operation is more indicative of another airspace volume and an encounter rate that corresponds to a lower risk classification (ARC); hence, reducing the initial ARC to a residual ARC (as per Table C.2). This requires the agreement of the Authority before the ARC may be reduced.

The SORA used expertise from subject matter experts to rate the airspace encounter category (AEC) and the variables that influence the encounter rates (i.e. proximity, geometry, and dynamics). The variables are not interdependent, nor do they influence the encounter outcome in the same manner. A small increase in one encounter rate variable can have major effects on the collision risk; conversely, a small increase in another variable could have limited effect on the collision risk. Hence, lowering the aircraft density of an AEC airspace does not equate to a direct and equal lowering of the ARC risk level. There is no direct correlation between an individual AEC variable and the ARC collision risk levels. In summary:

(a) there are three inter-dependent variables that affect the ARC;

(b) the contribution of each variable to the total collision risk is not the same; and

(c) for simplicity, the SORA only allows the manipulation of one of the variables: the proximity, i.e. the aircraft density.

The first step to potentially lowering the ARC is to determine the AEC and the associated density rating using Table C.1. 12 operational/airspace environments were considered for the SORA air risk classification, and they correspond to the 12 scenarios found in Figure 4 of the SORA main body.

Operational environment, AEC and ARC			
Operations in:	**Initial generalised density rating**	**Corresponding AEC**	**Initial ARC**
Airport/heliport environment			
OPS in an airport/heliport environment in class B, C or D airspace	5	AEC 1	ARC-d
OPS in an airport/heliport environment in class E airspace or in class F or G	3	AEC 6	ARC-c
Operations above 150 m (~500 ft) AGL but below flight level 600			

OPS > 150 m (~500 ft) AGL but < FL 600 in a Mode-S Veil or transponder mandatory zone (TMZ)	5	AEC 2	ARC-d
OPS > 150 m (~500 ft) AGL but < FL 600 in controlled airspace	5	AEC 3	ARC-d
OPS > 150 m (~500 ft) AGL but < FL 600 in uncontrolled airspace over an urban area	3	AEC 4	ARC-c
OPS > 150 m (~500 ft) AGL but < FL 600 in uncontrolled airspace over a rural area	2	AEC 5	ARC-c
Operations below 150 m (~500 ft) AGL			
OPS < 150 m (~500 ft) AGL in a Mode-S Veil or TMZ	3	AEC 7	ARC-c
OPS < 150 m (~500 ft) AGL in controlled airspace	3	AEC 8	ARC-c
OPS < 150 m (~500 ft) AGL in uncontrolled airspace over an urban area	2	AEC 9	ARC-c
OPS < 150 m (~500 ft) AGL in uncontrolled airspace over a rural area	1	AEC 10	ARC-b
Operations above flight level 600			
OPS > FL 600	1	AEC 11	ARC-b
Operations in atypical or segregated airspace			
OPS in atypical/segregated airspace	1	AEC 12	ARC-a

Table C.1 — Initial air risk class assessment

After determining the initial risk using Table C.1, an applicant may choose to reduce that risk using Table C.2. To understand Table C.2, the first column shows the AEC in the environment in which the UAS operator wishes to operate. Column A shows the associated airspace density rating for that AEC rated from 5 to 1, with 5 being very high density, and 1 being very low density.

Column B shows the corresponding initial ARC.

Column C is key to lowering the initial ARC. This column shows the relative density ratings that a UAS operator should demonstrate to the Authority in order to argue and justify that the actual local air density rating of the operational area is lower than the rating associated with the initial AEC (Column A) in Table C.1. If this can be shown and accepted by the Authority, then the new lower ARC level as shown in column D may be applicable.

As stated earlier, the UAS operator is responsible for collecting and analysing the airspace density and for demonstrating the effectiveness of their proposal for strategic mitigations by operational restrictions to the Authority. In summary, the UAS operator should demonstrate that the restrictions imposed on the UAS

operation can lower the risk of a collision by showing that the local airspace encounter rate, under the operational restrictions, is lower than the generalised AEC assessed encounter rate provided in Table C.1.

The strategic mitigation reduction case should be modelled after a safety case. The size and complexity of the strategic mitigation reduction depends entirely on what the UAS operator is trying to do, and where/when they want to do it. The strategic mitigation case as a safety case has two advantages. Firstly, it provides the UAS operator with a structured approach to describe and capture the operation, the hazards identified, the risk analysed, and the threat(s) mitigated. Secondly, it provides a safety case structure that a Authority is familiar with, which, in turn, helps the Authority to understand the UAS operator's intended operation and their reasoning as to why a reduction in the ARC can be safely justified.

As each authority is different, the SORA recommends the applicant to contact the Authority and/or ANSP to determine the format and presentation of the strategic mitigation reduction case.

The density rating of manned aircraft, assessed on a scale of 1 to 5, with 1 representing a very low density and 5 representing a very high density.				
Column	A	B	C	D
AEC	Initial generalised density rating for the environment	Initial ARC	If the local density can be demonstrated to be similar to:	New lowered (residual) ARC
AEC 1 or; AEC 2	5	ARC-d	4 or 3	ARC-c
			2 or 1[Note 1]	ARC-b
AEC 3	4	ARC-d	3 or 2	ARC-c
			1[Note 1]	ARC-b
AEC 4	3	ARC-c	1[Note 1]	ARC-b
AEC 5	2	ARC-c	1[Note 1]	ARC-b
AEC 6 or; AEC 7 or; AEC 8	3	ARC-c	1[Note 1]	ARC-b
AEC 9	2	ARC-c	1[Note 1]	ARC-b
Note 1: The reference environment for assessing density is AEC 10 (OPS < 400 ft AGL over rural areas).				
AEC10 and AEC 11 are not included in this table, as any ARC reduction would result in ARC-a. A UAS operator claiming a reduction to ARC-a should demonstrate that all the requirements that define atypical or segregated airspace have been met.				

Table C.2

To fully understand the above, the SORA provides three examples.

Example 1:

A UAS operator intends to operate in an airport/heliport environment, in class C airspace, which corresponds to AEC 1.

The UAS operator enters the initial ARC reduction table at Row AEC 1. Column A shows that the generalised airspace density of this environment is 5. Column B shows the associated initial ARC as ARC-d. Column C indicates that if a UAS operator can demonstrate that the actual, local airspace density corresponds to a generalised density rating of 3 or 4, then the ARC level may be reduced to a residual ARC-c (Column D). If a UAS operator demonstrates that the local airspace density corresponds more to scenarios with a density of 2 or 1, then the ARC level may be lowered to a residual ARC-b (Column D).

Example 2:

A UAS operator intends to operate in an airport/heliport environment, in class G airspace, with a corresponding level of AEC 6.

The UAS operator enters the initial ARC reduction table at Row AEC 6. Column A shows that the generalised airspace density rating that corresponds with this environment is 3. Column B shows the associated initial ARC as ARC-c. Column C indicates that if a UAS operator can demonstrate that the actual, local, airspace density corresponds more to the reference scenario that has a generalised density rating of 1, namely AEC 10, then the residual ARC level may be reduced to ARC-b (Column D).

Example 3:

A UAS operator intends to operate below 150m (~500 ft) AGL, in a class G (uncontrolled) airspace, over an urbanised area, with a corresponding level of AEC 9.

The UAS operator enters the initial ARC reduction table at Row AEC 9. Column A indicates that the generalised airspace density rating corresponding with this environment is 2. Column B shows the associated initial ARC is ARC-c. Column C indicates that if a UAS operator demonstrates that the local airspace density corresponds more to a density rating of 1, namely AEC 10, then the residual ARC level may be reduced to ARC-b (Column D).

C.6.3 Lowering the initial ARC by common structures and rules (optional)

Today, aviation airspace rules and structures mitigate the risk of collision. As the airspace risk increases, more structures and rules are implemented to reduce the risk. In general, the higher the aircraft density, the higher the collision risk, and the more structures and rules are required to reduce the collision risk.

In general, manned aircraft do not use very low level (VLL) airspace, as it is below the minimum safe height to perform an emergency procedure, ‘unless at such a height as will

permit, in the event of an emergency arising, a landing to be made without undue hazard to persons or property on the surface' (Ref. point SERA.3105 of the SERA Regulation). Subject to permission from the Authority, special flights may be granted permission to use this airspace. Every aircraft will cross VLL airspace in an airport environment for take-off and landing.

With the advent of UAS operations, VLL airspace is expected to soon become more crowded, requiring more common structures and rules to lower the collision risk. It is anticipated that U-space services will provide these risk mitigation measures. This will require mandatory participation by all aircraft in that airspace, similar to how the current flight rules apply to all manned aircraft operating in a particular airspace today.

SORA does not allow the initial ARC to be lowered through strategic mitigation by common structures and rules for all operations in AEC 1, 2, 3, 4, 5, and 111. Outside the scope of SORA, a UAS operator may appeal to the Authority to lower the ARC by strategic mitigation by using common structures. The determination of acceptability falls under the normal airspace rules, regulations and safety requirements for ATM/ANS providers.

Similarly, SORA does not allow for lowering the initial ARC through strategic mitigation by using common structures and rules for all operations in AEC 102.

The maximum amount of ARC reduction through strategic mitigation by using common structures and rules is by one ARC level.

SORA does allow for lowering the initial ARC through strategic mitigation by structures and rules for all operations below 150 m (~500 ft) AGL within VLL airspace (AECs 7, 8, 9 and 10).

To claim an ARC reduction, the UAS operator should show the following:

(a) the UA is equipped with an electronic cooperative system, and navigation and anticollision lighting3;

(b) a procedure has been implemented to verify the presence of other traffic during the UAS flight operation (e.g. checking other aircraft's filed flight plans, NOTAMs4, etc.);

(c) a procedure has been implemented to notify other airspace users of the planned UAS operation (e.g. filing of the UAS flight plan, applying for a NOTAM from the service provider for UAS5 operations, etc.);

(d) permission has been obtained from the airspace owner to operate in that airspace (if applicable);

(e) compliance with the airspace UAS flight rules, the UAS Regulation, and the policies, etc. applicable to the UAS operational volume and with which all/most aircraft are required to comply (these flight rules, the UAS Regulation, and policies are aimed primarily at UAS operations in VLL airspace);

(f) a UAS airspace structure (e.g. U-space) exists in VLL airspace to help keep UAS separated from manned aircraft. This structure must be complied with by all UAS in accordance with the EU or national regulations;

(g) a UAS airspace procedural separation service has been implemented for VLL airspace. The use of this service must be mandatory for all UAS to keep UAS separated from manned aircraft in accordance with the SERA Regulation; and

(h) all UAS operators can directly communicate with the air traffic controller or flight information services directly or through a U-space service provider in accordance with the SERA Regulation (EU).

C.6.3.1 Demonstration of strategic mitigation by structures and rules

The UAS operator is responsible for collecting and analysing the data required to demonstrate the effectiveness of their strategic mitigations by structures and rules to the Authority.

C.7 Determination of the residual ARC risk level by the Authority

As stated before, the UAS operator is responsible for collecting and analysing the data required to demonstrate the effectiveness of all their strategic mitigations to the Authority.

The Authority makes the final determination of the airspace residual ARC level.

Caution: As the SORA breaks down collision mitigation into strategic and tactical parts, there can be some overlap between all these mitigations. The UAS operator and the Authority need to be cognisant and to ensure that mitigations are not counted twice.

Although the static generalised risk (i.e. ARC) is conservative, there may be situations where that conservative assessment may be insufficient. In those situations, the Authority may raise the ARC to a level that is higher than that advocated by the SORA.

For example, a UAS operator surveys a forest near an airport for beetle infestation, and the airspace was assessed as being ARC-b. The airport is hosting an air show. The Authority informs the UAS operator that during the week of the air show, the ARC for that local airspace will be ARC-d. The UAS operator can either equip for ARC-d airspace or suspend operations until the air show is over.

Annex D to AMC1 to Article 11

TACTICAL MITIGATION COLLISION RISK ASSESSMENT

D.1 Introduction-tactical mitigation

The target audience for Annex D is the UAS operator who wishes to apply TMPR, robustness, integrity, and assurance levels for their operation.

Annex D provides the tactical mitigation(s) used to reduce the risk of a mid-air collision. The TMPR is driven by the residual collision risk of the airspace. Some of these tactical mitigations may also provide means of compliance with point SERA.3201 of the SERA Regulation, and the additional requirements of various states.

The air-risk model has been developed to provide a holistic method to assess the risk of an air encounter, and to mitigate the risk that an encounter develops into a mid-air collision. The SORA air-risk model guides the UAS operator, the Authority, and/or ANSP in determining whether an operation can be conducted in a safe manner. This Annex is not intended to be used as a checklist, nor does it provide answers to all the challenges of DAA. The guidance allows a UAS operator to determine and apply a suitable means of mitigation to reduce the risk of a midair collision to an acceptable level. This guidance does not contain prescriptive requirements, but rather objectives to be met at various levels of robustness.

D.2 Principles

The mitigation of the risk that an encounter develops into a mid-air collision is a highly dynamic, variable, and complicated process. To simplify the process, the air-risk model takes a more qualitative approach to arrive at an initial aggregated airspace risk assessment. After an assessment of the initial, unmitigated risk of an encounter, and optional application of strategic mitigations, this Annex assigns a performance requirement on the UAS operation to mitigate the remaining collision hazard (i.e. the residual airspace risk).

D.3 Scope, assumptions and definitions

See Annex C for the scope and assumptions

D.4 Knowledge of terms and definitions

To understand this section, the following SORA definitions need to be understood:

(a) atypical/segregated vs other airspace;

(b) AEC (see Annex C);

(c) initial ARC (see Annex C);

(d) residual ARC (see Annex C);

(e) ICAO conflict management (see ICAO Doc 9854, Section 2.7);

(f) strategic mitigation (see Annex C); (g) tactical mitigations and feedback loops; and (h) VLOS and BVLOS.

D.5 TMPR assignment

A tactical mitigation is a mitigation applied after take-off, and for the air risk model, it takes the form of a ‘mitigating feedback loop’. This feedback loop is dynamic in that it reduces the rate of collision by modifying the geometry and dynamics of the aircraft in conflict, based on real-time aircraft conflict information.

SORA tactical mitigations are applied to cover the gap between the residual risk of an encounter (the residual ARC) and the airspace safety objectives. The residual risk is the remaining collision risk after all strategic mitigations are applied.

D.5.1 Two classifications of tactical mitigation

There are two classifications of tactical mitigations within the SORA, namely:

(a) VLOS, whereby a pilot and/or observer uses (use) human vision to detect aircraft and take action to remain well clear from and avoid collisions with other aircraft.

(b) BVLOS, whereby an alternate means of mitigation to human vision, as in machine or machine assistance , is applied to remain well clear from and avoid collisions with other aircraft (e.g. ATC separation services, TCAS, DAA, U-space, etc.).

D.5.2 TMPR using VLOS

Originally the regulations for ‘see and avoid’ and ‘avoid collisions’, defined in point SERA.3201 of the SERA Regulation, assumed that a pilot was on board the aircraft. With UA, this assumption is no longer valid, as the aircraft is piloted remotely.

Under VLOS, the pilot/UAS operator accomplishes ‘see and avoid’ by keeping the UAS within their VLOS. The UAS remains close enough to the remote pilot/observer to allow them to see and avoid another aircraft with human vision unaided by any device other than, perhaps, corrective lenses. VLOS is generally considered an acceptable means of compliance with the ‘remain well clear from’ and ‘avoiding collisions’ requirements of point SERA.3201 of the SERA Regulation.

VLOS generally provides sufficient mitigation for cases where the requirements for tactical mitigations are low, medium, and high. Different states may have other rules and restrictions for VLOS operations (e.g. altitudes, horizontal distances, times for relaying critical flight information, UAS operator/observer training, etc.). In some situations, the Authority may decide that VLOS does not provide sufficient mitigation for the airspace risk, and may require compliance with additional rules and/or requirements. It is the UAS operators’ responsibility to comply with these rules and requirements.

The UAS operator should produce a documented VLOS de-confliction scheme, explaining the methods that will be applied for detection and the criteria used

to avoid incoming traffic. If the remote pilot relies on detection by observers, the use of communication phraseology, procedures, and protocols should be described. Since the VLOS operation may be sufficiently complex, a requirement to document and approve the VLOS strategy is necessary before approval by the Authority.

The use of VLOS as a mitigation does not exempt the UAS operator from performing the full SORA risk analysis.

D.5.3 TMPR using BVLOS

Since VLOS has operational limitations, there was a concerted effort to find an alternate means of compliance with the human 'see and avoid' requirements. This alternate means of mitigation is loosely described as 'detect and avoid (DAA)'. DAA can be achieved in several ways, e.g. through ground-based DAA systems, air-based DAA systems, or some combination of the two. DAA may incorporate the use of various sensors, architectures, and even involve many different systems, a human in the loop, on the loop, or no human involvement at all.

TMPR provides tactical mitigations to assist the pilot in detecting and avoiding traffic under BVLOS conditions. The TMPR is the amount of tactical mitigation required to further mitigate the risks that could not be mitigated through strategic mitigation (the residual risk). The amount of residual risk is dependent on the ARC. Hence, the higher the ARC, the greater the residual risk, and the greater the TMPR.

Since the TMPR is the total performance required by all tactical mitigation means, tactical mitigations may be combined. When combining multiple tactical mitigations, it is important to recognise that the mitigation means may interact with each other, depending on the level of interdependency. This may negatively affect the effectiveness of the overall mitigation. Care should be exercised not to underestimate the negative effects of interactions between mitigation systems. Regardless of whether mitigations or systems are dependent or independent, when they act on the same event, unintended consequences may occur.

D.5.3.1 TMPR assignment risk ratio

The SORA TMPR is based on the findings of several studies. These studies provide performance guidance using risk ratios. Table shows the SORA TMPR risk ratio requirements derived from those studies.

Air-Risk Class	TMPR	TMPR system risk ratio objectives
ARC-d	**high performance**	**system risk ratio ≤ 0.1**
ARC-c	medium performance	system risk ratio ≤ 0.33

ARC-b	low performance	system risk ratio ≤ 0.66
ARC-a	No performance requirement	No system risk ratio guidance; although the UAS operator/applicant may still need to show some form of mitigation as deemed necessary by the Authority

Table D.1 — TMPR risk ration requirements table

Table provides TMPR qualitative criteria as a qualitative means of compliance to help UAS operators translate the risk ratio quantitative values found in Table D.1 into system qualitative functional requirements. Table D.3 provides guidance for the TMPR integrity and assurance objectives for compliance with the objectives of Table C.1.

For the purpose of this assessment, the objectives of Table D.1 take precedence over the guidance provided in Tables D.2 and D.3.

D.5.3.2 TMPR qualitative criterion table

Table D.2, below, shows more qualitative criteria for the different functions and levels of the TMPR. The qualitative criteria are divided into five sub-functions of DAA, namely: detect, decide, command, execute, and the feedback loop. Where reference is made to the detection of a percentage of all aircraft, this should be read as a detection rate of the overall mix of aircraft anticipated to be encountered in the detection volume, and not limited to the detection of just the subset of aircraft in the mix.

	Function	TMPR Level				
		VLOS	No Requirement (ARC-a)	Low (ARC-b)	Medium (ARC-c)	High (ARC-d)

	Detect[1]			The expectation is for the applicant's DAA Plan to enable the operator to detect approximately 50 % of all aircraft in the detection volume[2]. This is the performance requirement in the absence of failures and defaults. It is required that the applicant has awareness of most of the traffic operating in the area in which the operator intends to fly, by relying on one or more of the following: • Use of (web-based) real time aircraft tracking services • Use Low Cost ADS-B In /UAT/FLARM[3]/Pilot Aware[3] aircraft trackers • Use of UTM/U-space Dynamic Geofencing[4] • Monitoring aeronautical radio communications (e.g. use of a scanner)[5]	The expectation is for the applicant's DAA Plan to enable the operator to detect approximately 90 % of all aircraft in the detection volume[2]. To accomplish this, the applicant will have to rely on one or a combination of the following systems or services: • Ground based DAA /RADAR • FLARM [3/6] • Pilot Aware [3/6] • ADS-B In/ UAT In Receiver[6] • ATC Separation Services[7] • UTM/U-space Surveillance Service[4] • UTM/U-space Early Conflict Detection and Resolution Service[4] • Active communication with ATC and other airspace users[5]. The operator provides an assessment of the effectiveness of the detection tools/methods chosen.	A system meeting RTCA SC-228 or EUROCAE WG-105 MOPS/MASPS (or similar) and installed in accordance with applicable requirements.

[1] For an in-depth understanding of the derivation, please see Annex G. Detection should be done with adequate precision for the avoidance manoeuvre to be effective.

[2] The detection volume is the volume of airspace (temporal or spatial measurement) which is required to avoid a collision (and remain well clear if required) with manned aircraft. It can be thought of as the last point at which a manned aircraft must be detected, so that the DAA system can performance all the DAA functions. The detection volume in not tied to the sensor(s) Field of View/Field of Regard. The size of the detection volume depends on the aggravated closing speed of traffic that may reasonably be encountered, the time required by the remote pilot to command the avoidance manoeuvre, the time required by the system to respond and the manoeuvrability and performance of the aircraft. The detection volume is proportionally larger than the alerting threshold. 3 FLARM and PilotAware are commercially available (trademarked) products/brands. They are referenced here only as example technologies. The references do not imply an endorsement by the approval authority for the use of these products. Other products offering similar functions may also be used.

[4] These refer to possible future applications of automated traffic management systems for unmanned aircraft in an UTM/U-space environment. These applications may not exist as such today.

[5] If permitted by the authority. May require a Radio-License or Permit. 6 The selection of systems to aid in electronic detection of traffic should be made considering the average equipment of the majority of aircraft operating in the area. For example: in areas where many gliders are known to operate, the use of FLARM or similar systems should be considered whereas for operations in the vicinity of large commercially operated aircraft, ADS-B IN is probably more appropriate. These refer to possible future applications of automated traffic management systems for unmanned aircraft in an UTM/U-space environment. These applications may not exist as such today. A subscription to these services may be required.

7 The selection of systems to aid in electronic detection of traffic should be made considering the average equipment of the majority of aircraft operating in the area.

	Function	TMPR Level				
		VLOS	No Requirement (ARC-a)	Low (ARC-b)	Medium (ARC-c)	**High (ARC-d)**

	Decide			The UAS operator should have a documented deconfliction scheme, in which the UAS operator explains which tools or methods will be used for detection and what the criteria are that will be applied for the decision to avoid incoming traffic. In case the remote pilot relies on detection by someone else, the use of phraseology will have to be described as well. Examples: • The operator will initiate a rapid descend if traffic is crossing an alert boundary and operating at less than 1000ft. • The observer monitoring traffic uses the phrase: 'DESCEND!, DESCEND!, DESCEND!'.	All requirements of ARC-b and in addition: 1. The operator provides an assessment of the human/machine interface factors that may affect the remote pilot's ability to make a timely and appropriate decision. 2. The UAS operator provides an assessment of the effectiveness of the tools and methods utilised for the timely detection and avoidance of traffic. In this context timely is defined as enabling the remote pilot to decide within 5 seconds after the indication of incoming traffic is provided. The UAS operator provides an assessment of the failure rate or availability of any tool or service the UAS operator intends to use.	A system meeting RTCA SC-228 or EUROCAE WG-105 MOPS/MASPS (or similar) and installed in accordance with applicable requirements.

	Function	TMPR Level				
		VLOS	No Requirement (ARC-a)	Low (ARC-b)	Medium (ARC-c)	**High (ARC-d)**
	Command			The latency of the whole command (C2) link, i.e. the time between the moment that the remote pilot gives the command and the airplane executes the command should not exceed 5 seconds.	The latency of the whole command (C2) link, i.e. the time between the moment that the remote pilot gives the command and the airplane executes the command should not exceed 3 seconds.	A system meeting RTCA SC-228 or EUROCAE WG-105 MOPS/MASPS (or similar) and installed in accordance with applicable requirements.
	Function	TMPR Level				
		VLOS	No Requirement (ARC-a)	Low (ARC-b)	Medium (ARC-c)	**High (ARC-d)**
	Execute			UAS descending to an altitude not higher than the nearest trees, buildings or infrastructure or ≤ 60 feet AGL is considered sufficient. The aircraft should be able to descend from its operating altitude to the 'safe altitude' in less than a minute.	Avoidance may rely on vertical and horizontal avoidance manoeuvring and is defined in standard procedures. Where horizontal manoeuvring is applied, the aircraft shall be demonstrated to have adequate performance, such as airspeed, acceleration rates, climb/descend rates and turn rates. The following are suggested minimum performance criteria:[10] • Airspeed: ≥ 50 knots • Rate of climb/descend: ≥ 500 ft/min • Turn rate: ≥ 3 degrees per second	A system meeting RTCA SC-228 or EUROCAE WG-105 MOPS/MASPS (or similar) and installed in accordance with applicable requirements.

[10] Low End Performance Representative (LEPR) performance requirments for RTCA SC-228 Study 5

	Function	TMPR Level				
		VLOS	No Requirement (ARC-a)	Low (ARC-b)	Medium (ARC-c)	**High (ARC-d)**

	Feedback Loop			Where electronic means assist the remote pilot in detecting traffic, the information is provided with a latency and update rate for intruder data (e.g. position, speed, altitude, track) that support the decision criteria. For an assumed 3 NM threshold, a 5 second update rate and a latency of 10 seconds is considered adequate (see example below).	The information is provided to the remote pilot with a latency and update rate that support the decision criteria. The applicant provides an assessment of the aggravated closure rates considering traffic that could reasonably be expected to operate in the area, traffic information update rate and latency, C2 Link latency, aircraft manoeuvrability and performance and sets the detection thresholds accordingly. The following are suggested minimum criteria: • Intruder and ownship vector data update rates: ≤ 3 seconds.	A system meeting RTCA SC-228 or EUROCAE WG-105 MOPS/MASPS (or similar) and installed in accordance with applicable airworthiness requirements.

Table D.2 — TMPR qualitative criteria table

D.5.3.3 Effects of aircraft equipment on tactical system performance

The performance of a tactical mitigation is affected by the equipment of both the UAS and threat aircraft, on an encounter-by-encounter basis. A tactical mitigation mitigates the encounter risk by using a set of sub-functions of the DAA routine, namely see/detect, decide, command, execute, and feedback loop. Equipment that aids these sub-functions increases the overall performance of the tactical mitigation system.

The following example illustrates how the equipment of both the UAS and threat aircraft affects the overall tactical performance. Given a threat aircraft equipped with a transponder, it is easier for other aircraft to detect and track the threat aircraft. In this case, the UAS can be equipped with a system that is able to detect and track transponders. However, a UAS that mitigates the risk by locating the threat aircraft by detecting their transponder (e.g. through ACAS-II V. 7.1) cannot use the same approach to mitigate the risks posed by an aircraft without a transponder.

Tactical mitigation equipment is not homogeneous within the airspace. Different classes of airspace have different mixes of equipment. General aviation aircraft tend to be less well-equipped than commercial aircraft. There will be differences in the mix of general aviation/commercial aircraft from one location/airspace to another. Based on the aircraft equipment, a specific tactical system (e.g. FLARM, ACAS, etc.) could mitigate the risk of a collision in some classes of airspace and not in others.

Therefore, the UAS operator needs to understand the effectiveness of their tactical mitigation systems within the context of the airspace in which they intend to operate, and select systems used for tactical mitigation accordingly. A TCAS II 7.1/ACAS-II equipped UAS will not mitigate all the encounter risks in an area where sailplanes equipped with FLARM are known to operate.

D.5.4. TMPR robustness (integrity and assurance) assignment

Table D.3, below, lists the recommended requirements to comply with the TMPR integrity and assurance assignment.

		TMPR: N/A (ARC-a)	TMPR: Low (ARC-b)	TMPR: Medium (ARC-c)	TMPR: High (ARC-d)
Level of integrity	Criteria	Allowable loss of function and performance of the Tactical Mitigation System: < 1 per 100 Flight Hours (1E-2 Loss/FH)	Allowable loss of function and performance of the Tactical Mitigation System: < 1 per 100 Flight Hours (1E-2 Loss/FH)	Allowable loss of function and performance of the Tactical Mitigation System: < 1 per 1 000 Flight Hours (1E-3 Loss/FH)	Allowable loss of function and performance of the Tactical Mitigation System: < 1 per 100 000 Flight Hours (1E-5 Loss/FH)
	Comments / Notes	*The requirement is considered to be met by commercially available products. No quantitative analysis is required.*	*The requirement is considered to be met by commercially available products. No quantitative analysis is required.*	*This rate is commensurate with a probable failure condition. These failure conditions are anticipated to occur one or more times during the entire operational life of each aircraft.*	*A quantitative analysis is required.*
		TMPR: N/A (ARC-a)	**TMPR: Low (ARC-b)**	**TMPR: Medium (ARC-c)**	**TMPR: High (ARC-d)**
Level of assurance	Criteria	N/A	The operator declares that the tactical mitigation system and procedures will mitigate the risk of collisions with manned aircraft to an acceptable level.	The operator provides evidence that the tactical mitigation system will mitigate the risk of collisions with manned aircraft to an acceptable level.	The evidence that the tactical mitigation system will mitigate the risk of collisions with manned aircraft to an acceptable level is verified by a competent third party.
	Comments / Notes	*N/A*	*N/A*	*N/A*	*N/A*

Table D.3 — TMPR integrity and assurance objectives

D.6 Maintenance and continued airworthiness

The DAA maintenance and continued airworthiness requirements are addressed in the SAIL requirements; please refer to Annex E of this Subpart.

Annex E to AMC1 to Article 11

INTEGRITY AND ASSURANCE LEVELS FOR THE OPERATIONAL SAFETY OBJECTIVES (OSOs)

E.1 How to use SORA Annex E

The following Table E.1 provides the basic principles to consider when using SORA Annex E.

	Principle description	Additional information
#1	Annex E provides assessment criteria for the integrity (i.e. safety gain) and assurance (i.e. method of proof) of OSOs proposed by an applicant.	The identification of OSOs for a given operation is the responsibility of the applicant.
#2	Annex E does not cover the LoI of the Authority. LoI is based on the Authority's assessment of the applicant's ability to perform the given operation.	
#3	To achieve a given level of integrity/assurance, when more than one criterion exists for that level of integrity/assurance, all applicable criteria need to be met.	
#4	'Optional' cases defined in SORA main body Table 6 do not need to be defined in terms of integrity and assurance levels in Annex E.	All robustness levels are acceptable for OSOs for which an 'optional' level of robustness is defined in Table 6 'Recommended OSOs' of the SORA main body.
#5	When the criteria to assess the level of integrity or assurance of an OSO rely on 'standards' that are not yet available, the OSO needs to be developed in a manner acceptable to the Authority.	
#6	Annex E intentionally uses non-prescriptive terms (e.g. suitable, reasonably practicable) to provide flexibility to both the applicant and the competent authorities. This does not constrain the applicant in proposing mitigations, nor the Authority in evaluating what is needed on a case-by-case basis.	
#7	This annex in its entirety also applies to single-person organisations.	

Table E.1 – Basic principles to consider when using SORA Annex E

E.2 OSOs related to technical issues with the UAS

OSO #01 — Ensure that the UAS operator is competent and/or proven

TECHNICAL ISSUE WITH THE UAS		**Level of integrity**		
		Low	**Medium**	**High**
OSO #01 Ensure that the UAS operator is competent and/or proven	Criteria	The applicant is knowledgeable of the UAS being used and as a minimum has the following relevant operational procedures: checklists, maintenance, training, responsibilities, and associated duties.	Same as low. In addition, the applicant has an organisation appropriate[1] for the intended operation. Also, the applicant has a method to identify, assess, and mitigate the risks associated with flight operations. These should be consistent with the nature and extent of the operations specified.	Same as medium.
	Comments	*N/A*	*[1] For the purpose of this assessment, 'appropriate' should be interpreted as commensurate with/proportionate to the size of the organisation and the complexity of the operation.*	*N/A*

TECHNICAL ISSUE WITH THE UAS		**Level of assurance**		
		Low	**Medium**	**High**
OSO #01 Ensure that the UAS operator is competent and/or proven	Criteria	The elements delineated in the level of integrity are addressed in the ConOps.	Prior to the first operation, the Authority or an entity that is designated by the Authority performs an audit of the organisation.	The applicant holds an organisational operating certificate (e.g LUC) or has a recognised flight test organisation. In addition, the Authority or an entity that is designated by the Authority verifies the UAS operator's competencies.
	Comments	*N/A*	*N/A*	*N/A*

OSO #02 — UAS designed and produced by a competent and/or proven entity

TECHNICAL ISSUE WITH THE UAS		**Level of integrity**		
		Low	**Medium**	**High**
OSO #02 UAS designed and produced by a competent and/or proven entity	Criteria for design	As a minimum, design documentation covers: (a) the specification of the materials; and (b) the suitability and durability of the materials used.	Same as low. In addition, design documentation also covers: (a) the configuration control; and (b) identification and traceability.	The design organisation complies with Subpart J of Annex I (Part 21) to Regulation (EU) No 748/2012.
	Criteria for production	As a minimum,production procedures cover the processes necessary to allow for repeatability in manufacturing, and conformity within acceptable tolerances.	Same as low. In addition, production procedures also cover: (a) the configuration control; (b) the verification of incoming products, parts, materials, and equipment; (c) identification and traceability; (d) in-process and final inspections & testing; (e) the control and calibration of tools; (f) handling and storage; and (g) the control of non-conforming items.	The production organisation complies with the organisational requirements that are defined in Subpart F or G of Annex I (Part 21) to Regulation (EU) No 748/2012.
	Comments	*N/A*	*N/A*	*N/A*

OSO #03 — UAS maintained by competent and/or proven entity

TECHNICAL ISSUE WITH THE UAS		Level of integrity		
		Low	**Medium**	**High**
OSO #03 UAS maintained by a competent and/or proven entity (e.g. industry standards)	Criteria	(a) The UAS maintenance instructions are defined, and, when applicable, cover the UAS designer's instructions and requirements. (b) The maintenance staff is competent and has received an authorisation to carry out UAS maintenance. (c) The maintenance staff use the UAS maintenance instructions while performing maintenance.	Same as low. In addition: (a) Scheduled maintenance of each UAS is organised and in accordance with a maintenance programme. (b) Upon completion, the maintenance log system is used to record all the maintenance conducted on the UAS, including releases. A maintenance release can only be accomplished by a staff member who has received a maintenance release authorisation for that particular UAS model/family.	Same as medium. In addition, the maintenance staff work in accordance with a maintenance procedure manual that provides information and procedures relevant to the maintenance facility, records, maintenance instructions, release, tools, material, components, defect deferral, etc.
	Comments	*N/A*	*N/A*	*N/A*

TECHNICAL ISSUE WITH THE UAS	Level of assurance		
	Low	**Medium**	**High**

OSO #03 UAS maintained by a competent and/or proven entity (e.g. industry standards)	Criterion #1 (Procedure)	(a) The maintenance instructions are documented. (b) The maintenance conducted on the UAS is recorded in a maintenance log system[1/2]. (c) A list of the maintenance staff authorised to carry out maintenance is established and kept up to date.	Same as low. In addition: (a) The maintenance programme is developed in accordance with standards considered adequate by the Authority or in accordance with a means of compliance acceptable to that authority. In addition, if the UAS has a DVR or a (R)TC, the maintenance programme includes the scheduled maintenance requirements developed as part of the design. (b) A list of the maintenance staff with maintenance release authorisation is established and kept up to date.	Same as medium. In addition, the maintenance programme and the maintenance procedures manual are validated by the Authority by an entity that is designated by the Authority.
	Comments	[1] *The objective is to record all the maintenance performed on the aircraft, and why it is performed (rectification of defects or malfunctions, modifications, scheduled maintenance, etc.).* [2] *The maintenance log may be requested for inspection/audit by the approving authority or an authorised representative.*	*N/A*	*N/A*
	Criterion #2 (Training)	A record of all the relevant qualifications, experience and/or training completed by the maintenance staff is established and kept up to date.	Same as low. In addition: (a) The initial training syllabus and training standard, including theoretical/practical elements, duration, etc., is defined and is commensurate with the authorisation held by the maintenance staff. (b) For staff that hold a maintenance release authorisation, the initial training is specific to that particular UAS model/family. (c) All maintenance staff have undergone initial training.	Same as medium. In addition: (a) A programme for the recurrent training of staff holding a maintenance release authorisation is established; and (b) This programme is validated by the Authority of the MS or by an entity that

				is designated by the Authority.
	Comments	*N/A*	*N/A*	*N/A*

OSO #04 — UAS developed to authority recognised design standards

TECHNICAL ISSUE WITH THE UAS	**Level of integrity**		
	Low	**Medium**	**High**

OSO #04 UAS developed to authority recognised design standards	Criteria	The UAS is designed to standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority. The standards and/or the means of compliance should be applicable to a low level of integrity and the intended operation.	The UAS is designed to standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority. The standards and/or the means of compliance should be applicable to a medium level of integrity and the intended operation.	The UAS is designed to standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority. The standards and/or the means of compliance should be applicable to a high level of integrity and the intended operation.
	Comments	*In case of experimental flights that investigate new technical solutions, the Authority may accept that recognised standards are not met.*		

TECHNICAL ISSUE WITH THE UAS		**Level of assurance**		
		Low	**Medium**	**High**
OSO #04 UAS developed to authority recognised design standards	Criteria	The Authority should request the applicant to use a UAS for which EASA has verified the claimed integrity through a DVR.	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012
	Comments	*N/A*	*N/A*	*N/A*

OSO #05 — UAS is designed considering system safety and reliability This OSO complements:

(a) the safety requirements for containment defined in the main body; and

(b) OSO #10 and OSO #12, which only address the risk of a fatality while operating over populated areas or assemblies of people.

TECHNICAL ISSUE WITH THE UAS		Level of integrity		
		Low	**Medium**	**High**
OSO #05 UAS is designed considering system safety and reliability	Criteria	The equipment, systems, and installations are designed to minimise hazards[1] in the event of a probable[2] malfunction or failure of the UAS.	Same as low. In addition, the strategy for detection, alerting and management of any malfunction, failure or combination thereof, which would lead to a hazard, is available.	Same as medium. In addition: (a) Major failure conditions are not more frequent than remote[3]; (b) Hazardous failure conditions are not more frequent than extremely remote[3]; (c) Catastrophic failure conditions are not more frequent than extremely improbable[3]; and (d) SW and AEH whose development error(s) may cause or contribute to hazardous or catastrophic failure conditions are developed to an industry standard or a methodology considered adequate by EASA and/or in accordance with means of compliance acceptable to EASA[4].
	Comments	*[1] For the purpose of this assessment, the term 'hazard' should be interpreted as a failure condition that relates to major, hazardous, or catastrophic consequences. [2] For the purpose of this assessment, the term 'probable' should be interpreted in a qualitative way as 'anticipated to occur one or more times during the entire system/operational life of a UAS'.*	*N/A*	*[3] Safety objectives may be derived from JARUS AMC RPAS.1309 Issue 2 Table 3 depending on the kinetic energy assessment made in accordance with Section 6 of EASA policy E.Y013-01.* *[4] Development assurance levels (DALs) for SW/AEH may be derived from JARUS AMC RPAS.1309 Issue 2 Table 3 depending on the kinetic energy assessment made in accordance with Section 6 of EASA policy E.Y013-01.*

TECHNICAL ISSUE WITH THE UAS		Level of assurance		
		Low	**Medium**	**High**
OSO #05 UAS is designed considering system safety and reliability	Criteria	A functional hazard assessment[1] and a design and installation appraisal that show that hazards are minimised, are available.	Same as low. In addition: (a) Safety analyses are conducted in line with standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority. (b) A strategy for the detection of single failures of concern includes pre-flight checks.	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part
TECHNICAL ISSUE WITH THE UAS		**Level of assurance**		
		Low	**Medium**	**High**
			The Authority should request the applicant to use a UAS for which EASA has validated the claimed integrity through a DVR.	21) to Regulation (EU) No 748/2012.
	Comments	*[1] The severity of failure conditions (no safety effect, minor, major, hazardous and catastrophic) should be determined according to the definitions provided in JARUS AMC RPAS.1309 Issue 2.*	*N/A*	*N/A*

OSO #06 — C3 link characteristics (e.g. performance, spectrum use) are appropriate for the operation

(a) For the purpose of the SORA and this specific OSO, the term ‘C3 link’ encompasses:

(1) the C2 link; and

(2) any communication link required for the safety of the flight.

(b) To correctly assess the integrity of this OSO, the applicant should identify the following:

(1) The performance requirements for the C3 links necessary for the intended operation.

(2) All the C3 links, together with their actual performance and RF spectrum usage.

Note: The specification of the performance and RF spectrum for a C2 Link is typically documented by the UAS designer in the UAS manual.

Note: The main parameters associated with the performance of a C2 link (RLP) and the performance parameters for other communication links (e.g. RCP for communication with ATC) include, but are not limited to, the following:

(i) the transaction expiration time;

(ii) the availability;

(iii) the continuity; and

(iv) the integrity.

Refer to the ICAO references for definitions.

(3) The RF spectrum usage requirements for the intended operation (including the need for authorisation if required).

Note: Usually, countries publish the allocation of RF spectrum bands applicable in their territories. This allocation stems mostly from the International Communication Union (ITU) Radio Regulations. However, the applicant should check the local requirements and request authorisation when needed since there may be national differences and specific allocations (e.g. national sub-divisions of ITU allocations). Some aeronautical bands (e.g. AM(R)S, AMS(R)S 5030-5091MHz) were allocated for potential use in UAS operations under the ICAO scope for UAS operations classified as cat. C (‘certified’), but their use may be authorised for operations under the ‘specific’ category. It is expected that the use of other licensed bands (e.g. those allocated to mobile networks) may also be authorised under the ‘specific’ category. Some un-licensed bands (e.g. industrial, scientific and medical (ISM)

or short-range devices (SRDs)) may also be acceptable under the 'specific' category; for instance, for operations with lower integrity requirements.

(4) Environmental conditions that might affect the performance of C3 links.

TECHNICAL ISSUE WITH THE UAS		**Level of integrity**		
		Low	**Medium**	**High**
OSO #06 C3 link characteristics (e.g. performance, spectrum use) are appropriate for the operation	Criteria	(a) The applicant determines that the performance, RF spectrum usage[1] and environmental conditions for C3 links are adequate to safely conduct the intended operation. (b) The remote pilot has the means to continuously monitor the C3 performance and ensures that the performance continues to meet the operational requirements[2].	Same as low[3].	Same as low. In addition, the use of licensed[4] frequency bands for C2 Links is required.
	Comments	*[1] For a low level of integrity, unlicensed frequency bands might be acceptable under certain conditions, e.g.:* *(a) the applicant demonstrates compliance with other RF spectrum usage requirements (e.g. Directive 2014/53/EU), by showing that the UAS equipment is compliant with these requirements; and* *(b) the use of mechanisms to protect against interference (e.g. FHSS, frequency de-confliction by procedure).*	*[3] Depending on the operation, the use of licensed frequency bands might be necessary. In some cases, the use of non-aeronautical bands (e.g. licensed bands for cellular network) may be acceptable.*	*[4] This ensures a minimum level of performance and is not limited to aeronautical licensed frequency bands (e.g. licensed bands for cellular network). Nevertheless, some operations may require the use of bands allocated to the aeronautical mobile service for the use of C2 Link (e.g. 5030 – 5091 MHz). In any case, the use of licensed frequency bands needs authorisation.*

TECHNICAL ISSUE WITH THE UAS		Level of integrity		
		Low	**Medium**	**High**
OSO #07	Criteria	The remote crew ensures that the UAS is in a condition for safe operation and conforms to the approved ConOps.[1]		

Inspection of the UAS (product inspection) to ensure consistency with the ConOps	*Comments*	*[1] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see the table below).*

OSO #07 — Inspection of the UAS (product inspection) to ensure consistency with the ConOps

The intent of this OSO is to ensure that the UAS used for the operation conforms to the UAS data used to support the approval/authorisation of the operation.

TECHNICAL ISSUE WITH THE UAS		**Level of assurance**		
		Low	**Medium**	**High**
OSO #07 Inspection of the UAS (product inspection) to ensure consistency with the ConOps	Criterion #1 (Procedures)	Product inspection is documented and accounts for the manufacturer's recommendations, if available.	Same as low. In addition, the product inspection is documented using checklists.	Same as medium. In addition, the product inspection procedures are validated by the Authority of the MS or by an entity that is designated by the Authority.
	Comments	*N/A*	*N/A*	*N/A*
	Criterion #2 (Training)	The remote crew is trained to perform the product inspection, and that training is self-declared (with evidence available).	(a) A training syllabus including a product inspection procedure is available. (b) The UAS operator provides competency-based, theoretical and practical training.	The Authority of the MS or an entity that is designated by the Authority: (a) validates the training syllabus; and (b) verifies the remote crew competencies.
	Comments	*N/A*	*N/A*	*N/A*

E.3 OSOs related to operational procedures

OPERATIONAL PROCEDURES		Level of integrity		
		Low	**Medium**	**High**
OSO #08, OSO #11, OSO #14 and OSO #21	Criterion #1 (Procedure definition)	(a) Operational procedures[1] appropriate for the proposed operation are defined and, as a minimum, cover the following elements: (1) Flight planning; (2) Pre- and post-flight inspections; (3) Procedures to evaluate the environmental co nditions before and during the mission (i.e. real-time evaluation); (4) Procedures to cope with unexpected adverse operating conditions (e.g. when ice is encountered during an operation not appro ed for icing conditions); (5) Normal procedures; (6) Contingency procedures (to cope with abnor mal situations); (7) Emergency procedures (to cope with emerge ncy situations); (8) Occurrence-reporting procedures; and (b) The limitations of the external systems supp orting the UAS peration[2] are defined in an OM.		
	Comments	*[1] Operational procedures cover the deterioration of he UAS itself and any external system supporting the UAS operation. tems To properly address the deterioration of external sys required for the operation, it is recommended to:* *(a) identify these 'external systems';* *(b) identify the modes of deterioration of the 'ex ernal systems' (e.g. complete loss of GNSS, GDOP/PDOP, latency issues, etc.) which would lead to a loss of control of the operation;* *(c) describe the means to detect these modes of deterioration of the external systems ; and* *(d) describe the procedure(s) used when ation is detected (e.g. activation of the emergency recovery capability, switch to deterior manual control, etc.).* *[2] In the scope of this assessment, external systems s pporting the UAS operation are defined as systems that are not already part of*		

		the UAS but are used to: (a) launch/take off the UA; (b) make pre-flight checks; or (c) keep the UA within its operational volume (e.g. GNSS, satellite systems, air traffic management, U-space). External systems activated/used after a loss of control of the operation are excluded from this definition.		
	Criterion #2 (Procedure complexity)	Operational procedures are complex and may potentially jeopardise the crew's ability to respond by increasing the remote crew's workload and/or their interaction with other entities (e.g. ATM, etc.).	Contingency/emergency procedures require manual control by the remote pilot[2] when the UAS is usually automatically controlled.	Operational procedures are simple.
OPERATIONAL PROCEDURES		**Level of integrity**		
		Low	**Medium**	**High**
	Comments	*N/A*	*[2] It should be considered that not all UAS have a mode where the pilot could directly control the surfaces; moreover, it may require significant skill not to make things worse.*	*N/A*
	Criterion #3 (Consideration of Potential Human Error)	At a minimum, operational procedures provide: (a) a clear distribution and assignment of tasks, and (b) an internal checklist to ensure staff are adequately performing their assigned tasks.	Operational procedures take human error into consideration.	Same as medium. In addition, the remote crew[3] receives crew resource management (CRM)[4] training.
	Comments	*N/A*	*N/A*	*[3] In the context of SORA, the term 'remote crew' refers to any person involved in the mission. [4] CRM training focuses on the effective use of all the remote crew to ensure safe and efficient operation, reducing*

				error, avoiding stress and increasing efficiency.

OPERATIONAL PROCEDURES		**Level of assurance**		
		Low	**Medium**	**High**
OSO #08, OSO #11, OSO #14 and OSO #21	Criteria	(a) Operational procedures do not require validation against either a standard or a means of compliance that is considered adequate by the Authority (b) The adequacy of the operational procedures is declared, except for emergency procedures, which are tested.	(a) Normal, contingency, and emergency procedures are documented and part of the operations manual (OM). (b) Operational procedures are validated against standards considered adequate by the Authority or in accordance with the means of compliance acceptable to that authority[1]. (c) The adequacy of the contingency and emergency procedures is proven through: (1) dedicated flight tests; or	Same as medium. In addition: (a) Flight tests performed to validate the procedures and checklists cover the complete flight envelope or are proven to be conservative. (b) The procedures, checklists, flight tests and simulations are validated by the Authority by an entity that is
			(2) simulation, provided that the representativeness of the simulation means is proven valid for the intended purpose with positive results; or (3) any ot+her means acceptable to the Authority.	designated by the Authority.
	Comments	*N/A*	*[1] AMC2 UAS.SPEC.030(3)(e) (Operational procedures for medium and high levels of robustness) is considered an acceptable means of compliance.*	

E.4 OSOs related to remote crew training

(a) The applicant needs to propose competency-based, theoretical and practical training that:

(1) is appropriate for the operation to be approved; and

(2) includes proficiency requirements and recurrent training.

(b) The entire remote crew (i.e. any person involved in the operation) should undergo competency-based, theoretical and practical training specific to their duties (e.g. pre-flight inspection, ground equipment handling, evaluation of the meteorological conditions, etc.).

REMOTE CREW COMPETENCIES		**Level of integrity**		
		Low	**Medium**	**High**
OSO #09, OSO #15 and OSO #22	Criteria	The competency-based, theoretical and practical training is adequate for the operation[1] and ensures knowledge of: (a) the UAS Regulation; (b) airspace operating principles; (c) airmanship and aviation safety; (d) human performance limitations; (e) meteorology; (f) navigation/charts; (g) the UAS; and (h) operating procedures.		
	Comments	*[1] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see table below).*		

REMOTE CREW COMPETENCIES	**Level of assurance**

		Low	Medium	High
OSO #09, OSO #15 and OSO #22	Criteria	Training is self-declared (with evidence available).	(a) Training syllabus is available and kept up to date. (b) The UAS operator provides competency-based, theoretical and practical training.	The Authority or an entity that is designated by the Authority: (a) validates the training syllabus; and (b) verifies the remote crew competencies.
	Comments	*N/A*	*N/A*	*N/A*

E.5 OSOs related to safe design

(a) The objectives of OSO#10 and OSO#12 are to complement the technical containment safety requirements by addressing the risk of a fatality while operating over populated areas or assemblies of people.

(b) In the scope of this assessment, external systems supporting UAS operations are defined as systems that are not already part of the UAS but are used to:

(1) launch/take off the UA;

(2) make pre-flight checks; or

(3) keep the UA within its operational volume (e.g. GNSS, satellite systems, air traffic management, U-space).

External systems activated/used after a loss of control of the operation are excluded from this definition.

	LEVEL of INTEGRITY

		Low	Medium	High
OSO #10 & OSO #12	Criteria	When operating over populated areas or assemblies of people, it can be reasonably expected that a fatality will not occur from any probable[1] failure[2] of the UAS or any external system supporting the operation.	When operating over populated areas or assemblies of people, it can be reasonably expected that a fatality will not occur from any single failure[3] of the UAS or any external system supporting the operation. SW and AEH whose development error(s) could directly lead to a failure affecting the operation in such a way that it can be reasonably expected that a fatality will occur, are developed to a standard considered adequate by the Authority and/or in accordance with means of compliance acceptable to that authority.	Same as medium
	Comments	*[1] For the purpose of this assessment, the term 'probable' should be interpreted in a qualitative way as, 'anticipated to occur one or more times during the entire system/operational life of a UAS'. [2] Some structural or mechanical failures may be excluded from the criterion if it can be shown that these mechanical parts were designed according to aviation industry best practices.*	*[3] Some structural or mechanical failures may be excluded from the no-single failure criterion if it can be shown that these mechanical parts were designed to a standard considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority*	

	LEVEL of ASSURANCE		
	Low	Medium	High

OSO #10 & OSO #12	Criteria	A design and installation appraisal is available. In particular, this appraisal shows that: (a) the design and installation features (independence, separation and redundancy) satisfy the low integrity criterion; and (b) particular risks relevant to the ConOps (e.g. hail, ice, snow, electromagnetic interference, etc.) do not violate the independence claims, if any.	Same as low. In addition, the level of integrity claimed is substantiated by analysis and/or test data with supporting evidence. If the operation is classified as SAIL IV, the Authority should request the applicant to use a UAS for which EASA has verified the claimed integrity through a DVR.	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012.
	Comments	*N/A*	*N/A*	*N/A*

E.6 OSOs related to the deterioration of external systems supporting UAS operations

For the purpose of SORA and this specific OSO, the term 'external services supporting UAS operations' encompasses any service providers necessary for the safety of the flight, such as communication service providers (CSPs) and U-space service providers1.

DETERIORATION OF EXTERNAL SYSTEMS SUPPORTING UAS OPERATIONS BEYOND THE CONTROL OF THE UAS		**Level of integrity**		
		Low	**Medium**	**High**
OSO #13 External services supporting UAS operations are adequate for the operation	Criteria	The applicant ensures that the level of performance for any externally provided service necessary for the safety of the flight is adequate for the intended operation. If the externally provided service requires communication between the UAS operator and the service provider, the applicant ensures there is effective communication to support the service provision. Roles and responsibilities between the applicant and the external service provider are defined.		
	Comments	*N/A*	*N/A*	*Requirements for contracting services with the service provider may be derived from ICAO Standards and Recommended Practices (SARPs) that are currently under development.*

1 External service should be understood as any service that is provided to the UAS operator, which is necessary to ensure the safety of a UAS operation and is provided by a service provider other than the UAS operator. Examples of external services are:

- provision of geographical zones data and geographical limitations (including orography);
- collection and transfer of occurrence data;
- training and assessment of remote pilots;
- communication services that support the C2 link and any other safety-related communication;
- services that support navigation, e.g. GNSS services (compliance with requirement UAS.STS-01.030(6) could be ensured by referring to the conditions of use of such services in the corresponding Service Definition Document (SDD) or an equivalent one if available.);
- provision of services related to flight planning and management, including related safety assessments; and
- U-space services, which are defined in the corresponding regulation(s) and may include one or more of the above-mentioned services.

DETERIORATION OF EXTERNAL SYSTEMS SUPPORTING UAS OPERATIONS BEYOND THE CONTROL OF THE UAS	Level of assurance		
	Low	Medium	High

OSO #13 External services supporting UAS operations are adequate for the operation	Criteria	The applicant declares that the requested level of performance for any externally provided service necessary for the safety of the flight is achieved (without evidence being necessarily available).	The applicant has supporting evidence that the required level of performance for any externally provided service required for the safety of the flight can be achieved for the full duration of the mission. This may take the form of a service-level agreement (SLA) or any official commitment that prevails between a service provider and the applicant on the relevant aspects of the service (including quality, availability, and responsibilities). The applicant has a means to monitor externally provided services which affect flight-critical systems and take appropriate actions if real-time performance could lead to the loss of control of the operation.	Same as medium. In addition: (a) the evidence of the performance of an externally provided service is achieved through demonstrations; and (b) the Authority or an entity that is designated by the Authority validates the claimed level of integrity.
	Comments	*N/A*	*N/A*	*N/A*

E.7 OSOs related to human error

OSO #16 — Multi-crew coordination

This OSO applies only to those personnel directly involved in the flight operation.

HUMAN ERROR		**Level of integrity**		
		Low	**Medium**	**High**
OSO #16 Multi crew coordination	Criterion #1 (Procedures)	Procedure(s) to ensure coordination between the crew members and robust and effective communication channels is (are) available and at a minimum cover: (a) assignment of tasks to the crew, and (b) establishment of step-by-step communications.[1]		

	Comments	*[1] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see the table below).*		
	Criterion #2 (Training)	Remote crew training covers multi-crew coordination	Same as low. In addition, the remote crew[2] receives CRM[3] training.	Same as medium.
	Comments	*N/A*	*[2] In the context of the SORA, the term 'remote crew' refers to any person involved in the mission. [3] CRM training focuses on the effective use of all the remote crew to assure a safe and efficient operation, reducing error, avoiding stress and increasing efficiency.*	*N/A*
	Criterion #3 (Communication devices)	N/A	Communication devices comply with standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority.	Communication devices are redundant[4] and comply with standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority.
	Comments	*N/A*	*N/A*	*[4] This implies the provision of an extra device to cope with the failure of the first device.*

HUMAN ERROR	**LEVEL of ASSURANCE**		
	Low	**Medium**	**High**

OSO #16 Multi crew coordination	Criterion #1 (Procedures)	(a) Procedures are not validated against either a standard or a means of compliance considered adequate by the Authority . (b) The adequacy of the procedures and checklists is declared.	(a) Procedures are validated against standards considered adequate by the Authority or in accordance with the means of compliance acceptable to that authority[1]. (b) The adequacy of the procedures is proven through: (1) dedicated flight tests; or (2) simulation, provided that the representativeness of the simulation means is proven valid for the intended purpose with positive results; or (3) any other means acceptable to the Authority.	Same as medium. In addition: (a) flight tests performed to validate the procedures cover the complete flight envelope or are proven to be conservative; and (b) the procedures, flight tests and simulations are validated by the Authority or an entity designated by the Authority.
	Comments	*N/A*	*[1] AMC2 UAS.SPEC.030(3)(e) (Operational procedures for medium and high levels of robustness) is considered an acceptable means of compliance.*	*N/A*
HUMAN ERROR		**LEVEL of ASSURANCE**		
		Low	**Medium**	**High**
	Criterion #2 (Training)	Training is self-declared (with evidence available).	(a) Training syllabus is available. (b) The UAS operator provides competency-based, theoretical and practical training.	The Authority of the MS or an entity that is designated by the Authority: (a) validates the training syllabus; and (b) verifies the remote crew competencies.
	Comments	*N/A*	*N/A*	*N/A*
	Criterion #3 (Communication devices)	*N/A*	The applicant has supporting evidence that the required level of integrity is achieved. This is typically done by testing, analysis, simulation1, inspection, design review or through operational experience.	The Authority should request the applicant to operate a UAS designed by an organisation approved by EASA according to Subpart J of Annex I (Part 21) to Regulation (EU) No 748/2012.

	Comments	*N/A*	*[1] When simulation is performed, the validity of the targeted environment that is used in the simulation needs to be justified.*	*N/A*

OSO #17 — Remote crew is fit to operate

(a) For the purpose of this assessment, the expression 'fit to operate' should be interpreted as physically and mentally fit to perform their duties and safely discharge their responsibilities.

(b) Fatigue and stress are contributory factors to human error. Therefore, to ensure that vigilance is maintained at a satisfactory level of safety, consideration may be given to the following:

(1) remote crew duty times;

(2) regular breaks;

(3) rest periods; and

(4) handover/takeover procedures.

HUMAN ERROR		**Level of integrity**		
		Low	**Medium**	**High**
OSO #17 Remote crew is fit to operate	Criteria	The applicant has a policy defining how the remote crew can declare themselves fit to operate before conducting any operation.	Same as low. In addition: — Duty, flight duty and resting times for the remote crew are defined by the applicant and adequate for the operation. — The UAS operator defines requirements appropriate for the remote crew to operate the UAS.	Same as Medium. In addition: — The remote crew is medically fit, — A fatigue risk management system (FRMS) is in place to manage any escalation in duty/flight duty times.

	Comments	*N/A*	*N/A*	*N/A*

HUMAN ERROR		**LEVEL of ASSURANCE**		
		Low	**Medium**	**High**
OSO #17 Remote crew is fit to operate	Criteria	The policy to define how the remote crew declares themselves fit to operate (before an operation) is documented. The remote crew fit-to-operate declaration (before an operation) is based on a policy defined by the applicant.	Same as low. In addition: — Remote crew duty, flight duty and the resting time policy are documented. — Remote crew duty cycles are logged and cover at a minimum: — when the remote crew member's duty day commences, — when the remote crew members are free from duties, and — resting times within the duty cycle. — There is evidence that the remote crew is fit to operate the UAS.	Same as medium. In addition: — Medical standards considered adequate by the Authority and/or the means of compliance acceptable to that authority are established and the Authority or an entity that is designated by the Authority verifies that the remote crew is medically fit. — The Authority of the MS or an entity that is designated by the Authority validates the duty/flight duty times. — If an FRMS is used, it is validated and monitored by the Authority of the MS or an entity that is designated by the Authority.
	Comments	*N/A*	*N/A*	*N/A*

OSO #18 — Automatic protection of the flight envelope from human errors

(a) Each UA is designed with a flight envelope that describes its safe performance limits with regard to minimum and maximum operating speeds, and its operating structural strength.

(b) Automatic protection of the flight envelope is intended to prevent the remote pilot from operating the UA outside its flight envelope. If the applicant demonstrates that the remote-pilot is not in the loop, this OSO is not applicable.

(c) A UAS implementing such an automatic protection function will ensure that the UA is operated within an acceptable flight envelope margin even in the case of incorrect remote-pilot control inputs (human errors).

HUMAN ERROR		LEVEL of INTEGRITY		
		Low	**Medium**	**High**
OSO #18 Automatic protection of the flight envelope from human errors	Criteria	The UAS flight control system incorporates automatic protection of the flight envelope to prevent the remote pilot from making any single input under normal operating conditions that would cause the UA to exceed its flight envelope or prevent it from recovering in a timely fashion.	The UAS flight control system incorporates automatic protection of the flight envelope to ensure the UA remains within the flight envelope or ensures a timely recovery to the designed operational flight envelope following remote pilot error(s).[1]	
	Comments	*N/A*	*[1] The distinction between a medium and a high level of robustness for this criterion is achieved through the level of assurance (see table below).*	

HUMAN ERROR		LEVEL of ASSURANCE		
		Low	**Medium**	**High**
OSO #18 Automatic protection of the flight envelope from human errors	Criteria	The automatic protection of the flight envelope has been developed in-house or out of the box (e.g. using commercial off-the-shelf elements), without following specific standards.	The Authority should request the applicant to use a UAS for which EASA has verified the claimed integrity through a DVR.	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012.
	Comments	*N/A*	*N/A*	*N/A*

OSO #19 — Safe recovery from human errors

(a) This OSO addresses the risk of human errors which may affect the safety of the operation if not prevented or detected and recovered in a timely fashion.

i) Errors can be made by anyone involved in the operation.

ii) An example could be a human error leading to the incorrect loading of the payload, with the risk of it falling off the UA during the operation. iii) Another example could be a human error not to extend the antenna mast, thus reducing the C2 link coverage.

Note: the flight envelope protection is excluded from this OSO since it is specifically covered by OSO #18.

(b) This OSO covers:

i) procedures and lists, ii) training, and

iii) UAS design, i.e. systems detecting and/or recovering from human errors (e.g. safety pins, use of acknowledgment features, fuel or energy consumption monitoring functions …)

<table>
<tr><th colspan="2" rowspan="2">HUMAN ERROR</th><th colspan="3">LEVEL of INTEGRITY</th></tr>
<tr><th>Low</th><th>Medium</th><th>High</th></tr>
<tr><td rowspan="4">OSO #19
Safe recovery from Human Error</td><td>Criterion #1 (Procedures and checklists)</td><td colspan="3">Procedures and checklists that mitigate the risk of potential human errors from any person involved with the mission are defined and used.
Procedures provide at a minimum:
— a clear distribution and assignment of tasks, and
— an internal checklist to ensure staff are adequately performing their assigned tasks.</td></tr>
<tr><td>Comments</td><td>N/A</td><td>N/A</td><td>N/A</td></tr>
<tr><td>Criterion #2 (Training)</td><td colspan="3">— The remote crew[1] is trained to use procedures and checklists.
— The remote crew[1] receives CRM[2] training.[3]</td></tr>
</table>

	Comments	[1] *In the context of SORA, the term 'remote crew' refers to any person involved in the mission.* [2] *CRM training focuses on the effective use of all the remote crew to ensure a safe and efficient operation, reducing error, avoiding stress and increasing efficiency.* [3] *The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see table below).*		
	Criterion #3 (UAS design)	Systems detecting and/or recovering from human errors are developed according to industry best practices.	Systems detecting and/or recovering from human errors are developed to standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority.	Same as medium.
	Comments	*N/A*	*N/A*	*N/A*

HUMAN ERROR		**LEVEL of ASSURANCE**		
		Low	**Medium**	**High**
OSO #19 Safe recovery from human error	Criterion #1 (Procedures and checklists)	(a) Procedures and checklists are not validated against either a standard or a means of compliance considered adequate by the Authority of the MS. (b) The adequacy of the procedures and checklists is declared.	(a) Procedures and checklists are validated against standards considered adequate by the Authority of the MS and/or in accordance with the means of compliance acceptable to that authority[1]. (b) The adequacy of the procedures and checklists is proven through: (1) dedicated flight tests, or (2) simulation, provided that the representativeness of the simulation means is	Same as medium. In addition: (a) Flight tests performed to validate the procedures and checklists cover the complete flight envelope or are proven to be conservative. (b) The procedures, checklists, flight tests and simulations are validated by the Authority of the MS or an entity that is
HUMAN ERROR		**LEVEL of ASSURANCE**		
		Low	**Medium**	**High**
			proven valid for the intended purpose with positive results; or (3) any other means acceptable to the Authority of the MS.	designated by the Authority.

	Comments	*N/A*	*[1] AMC2 UAS.SPEC.030(3)(e) (Operational procedures for medium and high levels of robustness) is considered an acceptable means of compliance.*	*N/A*
	Criterion #2 (Training)	Consider the criteria defined for the level of assurance of the generic remote crew training OSO (i.e. OSO #09, OSO #15 and OSO #22) corresponding to the SAIL of the operation.		
	Comments	*N/A*	*N/A*	*N/A*
	Criterion #3 (UAS design)	The applicant declares that the required level of integrity has been achieved[1].	The applicant has supporting evidence that the required level of integrity is achieved. That evidence is provided through testing, analysis, simulation[2], inspection, design review or operational experience. If the operation is classified as SAIL IV, the Authority should request the applicant to use a UAS for which EASA has verified the claimed integrity through a DVR. If the operation is classified as SAIL V the Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012.	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012.
	Comments	*[1] Supporting evidence may or may not be available.*	*[2] When simulation is performed, the validity of the targeted environment that is used in the simulation needs to be justified.*	*N/A*

OSO #20 — A human factors evaluation has been performed and the HMI has been found appropriate for the mission

HUMAN ERROR	LEVEL of INTEGRITY

		Low	Medium	High
OSO #20 A Human Factors evaluation has been performed and the HMI found appropriate for the mission	Criteria	The UAS information and control interfaces are clearly and succinctly presented and do not confuse, cause unreasonable fatigue, or contribute to remote crew errors that could adversely affect the safety of the operation.		
	Comments	*If an electronic means is used to support potential VOs in their role to maintain awareness of the position of the unmanned aircraft, its HMI:* — *is sufficient to allow the VOs to determine the position of the UA during operation; and* — *does not degrade the VO's ability to:* — *scan the airspace visually where the unmanned aircraft is operating for any potential collision hazard; and* — *maintain effective communication with the remote pilot at all times.*		

HUMAN ERROR		**LEVEL of ASSURANCE**		
		Low	**Medium**	**High**
OSO #20 A Human Factors evaluation has been performed and the HMI has been found appropriate for the mission	Criteria	The applicant conducts a human factors evaluation of the UAS to determine whether the HMI is appropriate for the mission. The HMI evaluation is based on inspection or analyses.	Same as Low but the HMI evaluation is based on demonstrations or simulations.[1] The Authority should request EASA to witness the HMI evaluation of the UAS.	Same as Medium. In addition, EASA witnesses the HMI evaluation of the UAS and the Authority of the MS or an entity that is designated by the Authority witnesses the HMI evaluation of the possible electronic means used by the AO.
	Comments	*N/A*	*[1] When simulation is performed, the validity of the targeted environment that is used in the simulation needs to be justified.*	*N/A*

E.8 OSOs related to adverse operating conditions

OSO #23 — Environmental conditions for safe operations are defined, measurable and adhered to

ADVERSE OPERATING CONDITIONS		LEVEL of INTEGRITY		
		Low	**Medium**	**High**
OSO #23 Environmental conditions for safe operations are defined, measurable and adhered to	Criterion #1 (Definition)	The environmental conditions for safe operations are defined and reflected in the flight manual or equivalent document.[1]		
	Comments	*[1] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see table below).*		
	Criterion #2 (Procedures)	Procedures to evaluate environmental conditions before and during the mission (i.e. real-time evaluation) are available and include assessment of meteorological conditions (METAR, TAFOR, etc.) with a simple recording system.[2]		
	Comments	*[2] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see table below).*		
	Criterion #3 (Training)	Training covers assessment of meteorological conditions.[3]		
	Comments	*[3] The distinction between a low, a medium and a high level of robustness for this criterion is achieved through the level of assurance (see table below).*		

ADVERSE OPERATING CONDITIONS		LEVEL of ASSURANCE		
		Low	**Medium**	**High**
OSO #23 Environmental conditions for safe operations defined, measurable and adhered to	Criterion #1 (Definition)	The applicant declares that the required level of integrity has been achieved.	The applicant has supporting evidence that the required level of integrity is achieved. This is typically done by testing, analysis, simulation, inspection, design review or through operational experience. If the operation is classified as SAIL IV, the Authority should request the applicant to use a UAS for which EASA has issued a DVR.	The Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012
	Comments	*N/A*		

	Criterion #2 (Procedures)	(a) Procedures do not require validation against either a standard or a means of compliance considered adequate	(a) Procedures are validated against standards considered adequate by the Authority of the MS and/or in accordance with the means of compliance acceptable to that authority[1].	Same as medium. In addition: (a) Flight tests performed to validate the procedures cover the complete flight envelope or are proven to be conservative.

		by the Authority of the MS. (b) The adequacy of the procedures and checklists is declared.	(b) The adequacy of the procedures is proven through: (1) dedicated flight tests, or (2) simulation, provided that the representativeness of the simulation means is proven valid for the intended purpose with positive results; or (3) any other means acceptable to the Authority of the MS.	(b) The procedures, flight tests and simulations are validated by the Authority of the MS or an entity that is designated by the Authority.
	Comments	*N/A*	*[1] AMC2 UAS.SPEC.030(3)(e) (Operational procedures for medium and high levels of robustness) is considered an acceptable means of compliance.*	*N/A*
	Criterion #3 (Training)	Training is self-declared (with evidence available).	— Training syllabus is available. — The UAS operator provides competencybased, theoretical and practical training.	The Authority of the MS or an entity that is designated by the Authority: — validates the training syllabus; and — verifies the remote crew competencies.
	Comments	*N/A*	*N/A*	*N/A*

OSO #24 — UAS is designed and qualified for adverse environmental conditions (e.g. adequate sensors, DO-160 qualification)

(a) To assess the integrity of this OSO, the applicant determines:

(1) whether credit can be taken for the equipment environmental qualification tests / declarations, e.g. by answering the following questions:

(i) Is there a Declaration of Design and Performance (DDP) available to the applicant stating the environmental qualification levels to which the equipment was tested?

(ii) Did the environmental qualification tests follow a standard considered adequate by the Authority (e.g. DO-160)?

(iii) Are the environmental qualification tests appropriate and sufficient to cover all the environmental conditions related to the ConOps?

(iv) If the tests were not performed following a recognised standard, were the tests performed by an organisation/entity that is qualified or that has experience in performing DO-160 like tests?

(2) Can the suitability of the equipment for the intended/expected UAS environmental conditions be determined from either in-service experience or relevant test results?

(3) Any limitations which would affect the suitability of the equipment for the intended/expected UAS environmental conditions.

(b) The lowest integrity level should be considered for those cases where a UAS equipment has only a partial environmental qualification and/or a partial demonstration by similarity and/or parts with no qualification at all.

ADVERSE OPERATING CONDITIONS		LEVEL of INTEGRITY		
		N/A	**Medium**	**High**
OSO #24 UAS is designed and qualified for adverse environmental conditions	Criteria	N/A	The UAS is designed to limit the effect of environmental conditions.	The UAS is designed using environmental standards considered adequate by the Authority and/or in accordance with a means of compliance acceptable to that authority.
	Comments	*N/A*	*N/A*	*N/A*

ADVERSE OPERATING CONDITIONS		LEVEL of ASSURANCE		
		N/A	**Medium**	**High**
OSO #24 UAS is designed and qualified for adverse environmental conditions	Criteria	N/A	The applicant has supporting evidence that the required level of integrity has been achieved. This is typically done by testing, analysis, simulation[2], inspection, design review or through operational experience.	If the operation is classified as SAIL IV, the Authority should request the applicant to use a UAS for which EASA has issued a DVR. If the operation is classified SAIL V or VI, the Authority should request the applicant to use a UAS for which EASA has issued a type certificate or restricted type certificate in accordance with Annex I (Part 21) to Regulation (EU) No 748/2012.

	Comments	*N/A*	*[2] When simulation is performed, the validity of the targeted environment that is used in the simulation needs to be justified*	*N/A*

AMC2 Article 11 Rules for conducting an operational risk assessment

PREDEFINED RISK ASSESSMENT PDRA-G01 Version 1.3 EDITION September 2023

(a) Scope

This PDRA is the result of applying the methodology that is described in AMC1 Article 11 of the UAS Regulation to UAS operations that are conducted in the 'specific' category:

(1) with UA with maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of multirotor) of up to 3 m and typical kinetic energy of up to 34 kJ;

(2) BVLOS of the remote pilot with visual air risk mitigation;

(3) over sparsely populated areas;

(4) less than 150 m (500 ft) above the surface overflown (or any other altitude reference defined by the Member State); and

(5) in uncontrolled airspace.

(b) PDRA characterisation and conditions

The characterisation and conditions for this PDRA are summarised in Table PDRA-G01.1 below:

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
1. Operational characterisation (scope and limitations)				
Level of human intervention		1.1 No autonomous operations: the remote pilot should have the ability to maintain control of the UA, except in case of a loss of the command and control (C2) link.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.2 The remote pilot should operate only one UA at a time.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

1 To be filled in by the UAS operator.

2 To be filled in by the UAS operator.

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
	Self-declaration	1.3 The remote pilot should not operate the UA from a moving vehicle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.4 The remote pilot should not hand the control of the UA over to another command unit.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

UA range limit	Self-declaration	1.5 Launch/recovery: at VLOS distance from the remote pilot, if not operating from a safe prepared area. *Note: 'safe prepared area' means a controlled ground area that is suitable for the safe launch/recovery of the UA.*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.6 In flight: 1.6.1 If no AOs are employed: the UA is not operated further than 1 km (or other distance defined by the Authority) from the remote pilot. *Note: The remote pilot's workload should allow them to continuously visually scan the airspace.*	*Please include a reference to the relevant chapter of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		1.6.2 If AOs are employed: the range is not limited as long as the UA is not operated further than 1 km (unless a different distance is defined by the Authority) from the AO who is nearest to the UA.	*Please include a reference to the relevant chapter of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
Overflown areas	Declaration supported by data	1.7 UAS operations should be conducted over sparsely populated areas.	*Please include a reference to the relevant chapter of the OM where the procedures for determining the population density are provided.*	'I declare compliance.' Please describe how population density data is identified.

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**

UA limitations	Self-declaration	1.8 Maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of a multirotor): 3 m	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.9 Typical kinetic energy (as defined in paragraph 2.3.1(k) of AMC1 to Article 11 of the UAS Regulation: up to 34 kJ	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Flight height limit	Self-declaration	1.10 The maximum height of the operational volume should not be greater than 150 m (500 ft) above the overflown area (or any other altitude reference defined by the Member State). *Note: In addition to the vertical limit of the operational volume, an air risk buffer is to be considered (see 'Air risk' under point 3 of this table).*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Airspace	Self-declaration	1.11 The UA should be operated:		
		1.11.1 in uncontrolled airspace (corresponding to an air risk that can be classified as ARC-b); or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.11.2 in a segregated area (corresponding to an air risk that can be classified as ARC-a); or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.11.3 as otherwise established by the Member States in accordance with Article 15 (with an associated air risk that can be classified as not higher than ARC-b).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Visibility	Self-declaration	1.12 The UA should be operated in an area where flight visibility is greater than 5 km. *Note: Please refer to GM1 UAS.STS-02.020(3).*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions						
Topic	**Method of proof**	**Condition**			**Integrity[1]**	**Proof[2]**
Others	Self-declaration	1.13 The UA should not be used to drop material or to carry dangerous goods, except for dropping items in connection with agricultural, horticultural or forestry activities where the carriage of such items does not contravene any other applicable regulations.			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
2. Operational risk classification (according to the classification defined in AMC1 to Article 11 of the UAS Regulation)						
Final GRC	3	**Final ARC**	ARC-b	**SAIL**	II	
3. Operational mitigations						
Operational volume (see Figure 2 of AMC1 Article 11)	Self-declaration	3.1 To determine the operational volume, the applicant should consider the positionkeeping capabilities of the UAS in 4D space (latitude, longitude, height, and time).			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		3.2 In particular, the accuracy of the navigation solution, the flight technical error of the UAS, as well as the flight path definition error (e.g. map error) and latencies should be considered and addressed when determining the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.3 The remote pilot should apply emergency procedures as soon as there is an indication that the UA may exceed the limits of the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Ground risk		3.4 The UAS operator should establish a ground risk buffer to protect third parties on the ground outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4.1 The minimum criterion should be the use of the '1:1 rule' (e.g. if the UA is planned to operate at a height of 150 m,	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Operational volume (see Figure 2 of AMC1 Article 11)	Self-declaration	3.1 To determine the operational volume, the applicant should consider the positionkeeping capabilities of the UAS in 4D space (latitude, longitude, height, and time).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.2 In particular, the accuracy of the navigation solution, the flight technical error of the UAS, as well as the flight path definition error (e.g. map error) and latencies should be considered and addressed when determining the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		3.3 The remote pilot should apply emergency procedures as soon as there is an indication that the UA may exceed the limits of the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Ground risk		3.4 The UAS operator should establish a ground risk buffer to protect third parties on the ground outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4.1 The minimum criterion should be the use of the '1:1 rule' (e.g. if the UA is planned to operate at a height of 150 m,	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		the ground risk buffer should at least be 150 m).		
		3.5 The operational volume and the ground risk buffer should be all contained in a sparsely populated area.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
	Self-declaration	3.6 The applicant should evaluate the area of operations typically by means of an on-site inspection or appraisal, and should be able to justify a lower density of people at risk in the operational area and the ground risk buffer.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Air risk	Self-declaration	3.7	The UAS operator should establish an air risk buffer to protect third parties in the air outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.8	This air risk buffer should be contained in an 'airspace that meets the conditions defined in 1.11 and over sparsely populated areas. If the operation is limited at a height below 120 m, no additional vertical air risk buffer is required.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.' *If the height of the operation is above 120 m and up to 150 m, please add the following:* 'Supporting evidence is included in the OM.' 'Justification supporting the appropriate air risk buffer is documented in […].'
		3.9	The operational volume should be outside any geographical zone corresponding to a flight restriction zone, as defined by the responsible authority, unless the UAS operator has been granted appropriate permission.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.10	Prior to the flight, the remote pilot should assess the proximity of the planned operation to manned aircraft activity.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
PDRA characterisation and conditions					
Topic	**Method of proof**		**Condition**	**Integrity[3]**	**Proof[4]**

[3] The UAS operator should demonstrate that they have sufficient confidence in the accuracy of the information about the height of the UA and the means to advert and avoid other airspace users and obstacles in the vicinity of the UA.

[4] Please refer to point UAS.STS-02.050 for the AO's main responsibilities.

	Declaration supported by data	3.11 If the UAS operation is performed above 120 m and up to 150 m, the UAS operator should develop appropriate procedures to not jeopardise other airspace users.	*Please include a reference to the relevant chapter/section of the OM. Please describe how the remote pilots and, if employed, the AOs are able to assess the height of the UA compared to other airspace users*[1]	'I declare compliance and supporting evidence is included in the OM.'
Observers[2]	Self-declaration	3.12 If the UAS operator decides to employ one or more airspace observers (AOs), the remote pilot may operate the UA up to the distance that is specified in point 1.6.2.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		3.13 The UAS operator should ensure the correct placement and the appropriate number of AOs along the intended flight path. Prior to each flight, the UAS operator should verify that:	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		3.13.1 the visibility and the planned distance of the AOs are within the acceptable limits that are defined in the operations manual (OM);	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		3.13.2 there are no potential terrain obstructions for each AO;	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		3.13.3 there are no gaps between the zones that are covered by each of the AOs;	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		3.13.4 communication with each AO is established and effective; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		3.13.5 if means are used by the AOs to determine the position of the UA, those means are functioning and effective. *Note: Instead of an AO, the remote pilot may perform the visual scan of the airspace, provided that the workload allows them to perform their duties.*	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
4. UAS operator and UAS operations conditions				
UAS operator and UAS operations	Declaration supported by data	4.1 The UAS operator should:		
		4.1.1 develop an operations manual (OM) (for the template, refer to AMC1 UAS.SPEC.030(3)(e) and to the complementary information in GM1 UAS.SPEC.030(3)(e));	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.2 develop procedures to ensure that the security requirements applicable to the area of operations are complied with during in the intended operation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.3 develop measures to protect the UAS against unlawful interference and unauthorised access;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

		4.1.4 develop procedures to ensure that all operations comply with Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data; in particular, the UAS operator should carry out a data protection impact assessment, when this is required by the data protection national authority of the Member State with regard to the	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		application of Article 35 of that Regulation;		
		4.1.5 develop guidelines for its remote pilots to plan UAS operations in a manner that minimises nuisance, including noise and other emissionsrelated nuisance, to people and animals;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.6 develop an emergency response plan (ERP) in accordance with the conditions for a 'medium' level of robustness (please refer to AMC3 UAS.SPEC.030(3)(e);	*Please describe how this condition is met.*	'I declare compliance and that the ERP is available to the competent authority for review.'

		4.1.7 validate the operational procedures in accordance with the conditions for a 'medium' level of robustness, which are included in AMC2 UAS.SPEC.030(3)(e);	*Please describe how this condition is met.*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'
		4.1.8 ensure the adequacy of the contingency and emergency procedures, and prove it through any of the following: (a) dedicated flight tests; or (b) simulations, provided that the representativeness of the simulation means is proven for the intended purpose with positive results; or (c) any other means acceptable to the Authority;	*Please describe how this condition is met.*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'
		4.1.9 have a policy that defines how the remote pilot and any other personnel in charge of duties essential to the UAS operation can declare themselves fit to operate before conducting any operation;	*Please describe how this condition is met.*	'I declare compliance and that the description for meeting this condition is available to the Authority for review. '

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		4.1.10 designate for each flight a remote pilot with adequate competency and other personnel in charge of duties essential to the UAS operation if needed;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

		4.1.11 ensure that the UAS operation effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.12 keep for a minimum of 3 years and maintain up to date a record of the information on UAS operations, including any unusual technical or operational occurrences and other data as required by the declaration or by the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that for recordkeeping data is available the competent authority review.'
UAS maintenance	Self-declaration	4.2 The UAS operator should:		
		4.2.1 ensure that the UAS maintenance instructions that are defined by the UAS operator are included in the OM and cover at least the UAS manufacturer's instructions and requirements, when applicable;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.2 ensure that the maintenance staff follow the UAS maintenance instructions when performing maintenance;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.3 keep for a minimum of 3 years and maintain up to date a record of the maintenance activities conducted on the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.4 establish and keep up to date a list of the maintenance staff employed by the	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		UAS operator to carry out maintenance activities;		
		4.2.5 comply with point UAS.SPEC.100, if the UAS uses certified equipment;	*Please include a reference to the relevant chapter/section of the OM or n/a.*	'I declare compliance.' or 'n/a'
External services	Self-declaration	4.3 The UAS operator should ensure that the level of performance for any externally provided service that is necessary for the safety of the flight is adequate for the intended operation. The UAS operator should declare that this level of performance is adequately achieved.	*Please describe how this condition is met.*	'I declare compliance.'
		4.4 The UAS operator should define and allocate the roles and responsibilities between the UAS operator and the external service provider(s), if applicable.	*Please describe how this condition is met.*	'I declare compliance.'
5. Conditions for the personnel in charge of duties essential to the UAS operation				
General	Declaration supported by data	5.1 The UAS operator should ensure that all personnel in charge of duties essential to the UAS operation are provided with competency-based, theoretical and practical training specific to their duties, which consists of the applicable theoretical elements derived from AMC1 UAS.SPEC.050(1)(d), and practical elements from AMC2 UAS.SPEC.050(1)(d) and UAS.SPEC.050(1)(e). In addition, for non-remote pilots, also from AMC3 UAS.SPEC.050(1)(d).	*Please describe how this condition is met.*	'I declare compliance.' Evidence of training is available for inspection at the request of the Authority or its authorised representative. The training programme is documented in the OM.

		5.2 The UAS operator should keep and maintain up to date a record of all the relevant qualifications and training courses completed by the remote pilot and the	*Please describe how this condition is met.*	'I declare compliance.' Record-keeping data is available for inspection at the request of the Authority.

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		other personnel in charge of duties essential to the UAS operation and by the maintenance staff for at least 3 years after those persons have ceased to be employed by the organisation or have changed position within the organisation.		
Remote pilot	Self-declaration	5.3 The remote pilot should have the authority to cancel or delay any or all flight operations under the following conditions:		
		5.3.1 when the safety of persons is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.2 when property on the ground is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.3 when other airspace users are jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.4 when there is a violation of the terms of the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		5.4 If AOs are employed, the remote pilot should ensure that the necessary number of AOs is available and correctly placed, and that the communication with them can be adequately established.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.5 The remote pilot should:		
		5.5.1 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;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.5.2 be familiar with the manufacturer's instructions provided by the manufacturer of the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.5.3 ensure that the UA remains clear of clouds;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		5.5.4 perform unaided visual scan of the airspace and ensure that the AO(s) can perform the same, if required, to avoid any potential collision hazard;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.5.5 obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15 of the UAS Regulation; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		5.5.6 ensure that the UAS is in a safe condition to complete the intended flight safely, and if applicable, check whether the direct remote identification is active and up to date.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Multi-crew cooperation (MCC)	Self-declaration	5.6 Where multi-crew cooperation (MCC) is required, the UAS operator should:		
		5.6.1 designate the remote pilot-in-command to be responsible for each flight;	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.6.2 include procedures to ensure coordination between the remote crew members through robust and effective communication channels; those procedures should cover, as a minimum:	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.6.2.1 the assignment of tasks to the remote crew members; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.6.2.2 the establishment of step-by-step communication; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		5.6.3 ensure that the training of the remote crew covers MCC.	Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.	'I declare compliance.' or 'n/a'

Maintenance staff	Declaration supported by data	5.7 Any maintenance staff member that is authorised by the UAS operator to perform maintenance activities should have been adequately trained in the documented maintenance procedures	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.' Evidence of training is available at the request of the Authority.
Personnel in charge of duties essential to the UAS operation are fit to operate	Self-declaration	5.8 The personnel in charge of duties essential to the UAS operation should declare that they are fit to operate before conducting any operation, based on the policy that is defined by the UAS operator.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
6. Technical conditions				
		6.1 The UAS should be equipped with means to monitor the critical parameters of a safe flight, in particular the following:		
		6.1.1 the UA position, height or altitude, ground speed or airspeed, attitude and trajectory;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.1.2 the UAS energy status (fuel, battery charge, etc.); and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.1.3 the status of critical functions and systems; as a minimum, for services based on RF signals (e.g. C2 Link, GNSS, etc.), means should be provided to monitor the adequate performance and trigger an alert when the performance level becomes too low.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.2 The UA should have the performance capability to descend safely from its operating altitude to a 'safe altitude' in less	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		than 1 minute, or have a descent rate of at least 2.5 m/s (500 fpm).		
Human–machine interface (HMI)	Self-declaration	6.3 The UAS information and control interfaces should be clearly and succinctly presented and should not confuse, cause unreasonable fatigue, or contribute to causing any disturbance to the personnel in charge of duties essential to the UAS operation in such a way that could adversely affect the safety of the operation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.4 If an electronic means is used to support AOs in their role of maintaining awareness of the position of the UA, its HMI should:		
		6.4.1 be sufficiently easy to understand to allow AOs to determine the position of the UA during the operation; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'*	'I declare compliance.' or 'n/a'
		6.4.2 not degrade the AOs' ability to:		
		6.4.2.1 perform unaided visual scan of the airspace where the UA is operating for any potential collision hazard; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'*	'I declare compliance.' or 'n/a'
		6.4.2.2 maintain effective communication with the remote pilot at all times.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'*	'I declare compliance.' or 'n/a'

		6.5 The UAS operator should conduct a UAS evaluation that considers and addresses human factors to determine whether the HMI is appropriate for the operation.	*Please describe how this condition is met.*	'I declare compliance.'
C2 links and communication		6.6 The UAS should comply with the applicable requirements for radio equipment and the use of the RF spectrum.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
	Self-declaration	6.7 Protection mechanisms against interference should be used, especially if unlicensed bands (e.g. ISM) are used for the C2 link (mechanisms such as FHSS, DSSS or OFDM technologies, or frequency deconfliction by procedure).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.8 The UAS should be equipped with a C2 link that is protected against unauthorised access to the command-and-control functions.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.9 In case of a loss of the C2 link, the UAS should have a reliable and predictable method to recover the command-and-control link of the UA or to terminate the flight in a way that reduces any undesirable effect on third parties in the air or on the ground.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		6.10 Communication between the remote pilot and the AO(s) should allow the remote pilot to manoeuvre the UA with sufficient time to avoid any risk of collision with manned aircraft, in accordance with point UAS.SPEC.060(3)(b) of the UAS Regulation.	*Please describe how this condition is met.*	'I declare compliance.'
Tactical mitigation	Self-declaration	6.11 The UAS design should be adequate to ensure that the time required between a command given by the remote pilot and the UA executing it does not exceed 5 seconds.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.12 Where an electronic means is used to assist the remote pilot and/or AOs in being aware of the UA position in relation to potential 'airspace intruders', the information is provided with a latency and an update rate	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		for intruder data (e.g. position, speed, altitude, track) that support the decision criteria.		
Containment	Declaration supported by data	6.13 To ensure a safe recovery from a technical issue that involves the UAS or an external system that supports the operation, the UAS should comply with the following basic containment provisions:		

		6.13.1 no probable failure of the UAS or of any external system that supports the operation would lead to operation outside the operational volume; and	*Please describe how this condition is met*	applies.' 'n/a since enhanced containment or 'A at leas — re compliance.' design and tion appraisal is available overs t: — the design and installation features (independence, separation, and redundancy); and the particular risks (e.g. hail, ice, snow, electromagnetic interference, etc.) relevant to the type of operation.'
		6.13.2 it is reasonably expected that a fatality will not occur due to any probable failure of the UAS or of any external system that supports the operation.	*Please describe how this condition is met*	
		6.14 The vertical extension of the operational volume should be 150 m above the surface (or any other reference altitude defined by the Member State). *Note: The term 'probable' should be understood in its qualitative interpretation, i.e. 'anticipated to occur one or more times during the entire system/operational life of an item'.*	*Please describe how this condition is met*	
		6.15 The following enhanced containment conditions should apply if the adjacent area includes an assembly of people or if the adjacent airspace is classified as ARC-d (in accordance with SORA):		

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**

	Declaration supported by data	6.15.1 The UAS should be designed to standards that are considered adequate by the Authority and/or in accordance with a means of compliance that is acceptable to that Authority such that:	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	'N/A since the basic containment applies' or 'I declare compliance with MoC Light-UAS.2511. Analysis and/or test data with supporting evidence is available.' or 'The UAS has a DVR demonstrating compliance with the enhanced containment requirements.'
		6.15.1.1. the probability of the UA leaving the operational volume should be less than 10^{-4}/FH; and	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	
		6.15.1.2 no single failure of the UAS or of any external system that supports the operation should lead to operation outside the ground risk buffer. *Note: The term 'failure' should be understood as an occurrence that affects the operation of a component, part, or element in such a way that it can no longer function as intended. Errors may cause failures but are not considered to be failures. Some structural or mechanical failures may be excluded from this criterion if it can be shown that these mechanical parts were designed according to aviation industry best practices.*	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	
PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[5]**	**Proof[2]**

[5] Applicable from 1 July 2022.

		6.15.2 SW and AEH whose development error(s) could directly lead to operations outside the ground risk buffer should be developed according to an industry standard or methodology that is recognised as adequate by EASA. *Note 1: The proposed additional safety conditions cover both the integrity and the assurance levels.* *Note 2: The proposed additional safety conditions do not imply a systematic need to develop the SW and AEH according to an industry standard or methodology that is recognised as adequate by the Authority. For instance, if the UA design includes an independent engine shutdown function that systematically prevents the UA from exiting the ground risk buffer due to single failures or an SW/AEH error of the flight controls from occurring, the intent of the conditions of point 6.15.1 above could be considered met.*	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	
Remote identification[1]	Self-declaration	6.16 The UAS has a unique serial number compliant with standard ANSI/CTA2063-A-2019, Small Unmanned Aerial Systems Serial Numbers, 2019, according to Article 40(4) of Regulation (EU) 2019/945.	*Please describe how this condition is met.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[6]**	**Proof[2]**
		6.17 the UAS is equipped with a remote identification system according to Article 40(5) of Regulation (EU) 2019/945.	*Please describe how this condition is met.*	'I declare compliance.'
Lights[1]	Self-declaration	6.18 If the UAS is operated at night, it is equipped with at least one green flashing light according to point UAS.SPEC.050(1)(l)(i) of the UAS Regulation.	*Please describe how this condition is met.*	'I declare compliance.' or 'n/a'

Table PDRA-G01.1 — Main limitations and conditions for PDRA-G01

AMC3 Article 11 Rules for conducting an operational risk assessment

PREDEFINED RISK ASSESSMENT PDRA-G02 Version 1.2 EDITION September 2023

(a) Scope

This PDRA is the result of applying the methodology that is described in AMC1 to Article 11 of the UAS Regulation to UAS operations conducted in the 'specific' category with the following main attributes:

(1) UA with maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of a multirotor) of up to 3 m and typical kinetic energies of up to 34 kJ;

(2) BVLOS of the remote pilot;

(3) over sparsely populated areas;

(4) in airspace that is reserved or segregated for the UAS operation, corresponding to an air risk that can be classified as ARC-a.

(5) within the range of the direct C2 link (radio line of sight) up to the height of the upper boundary of the reserved airspace.

(b) PDRA characterisation and conditions

The characterisation and conditions for this PDRA are summarised in Table PDRA-G02.1 below.

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[7]**	**Proof[8]**
1. Operational characterisation (scope and limitations)				
Level of human intervention	Self-declaration	1.1 No autonomous operations: the remote pilot should have the ability to maintain control of the UA, except in case of a loss of the command-and-control (C2) link.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

[7] To be filled in by the UAS operator.

[8] To be filled in by the UAS operator.

		1.2 The remote pilot should operate only one UA at a time.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.3 The remote pilot should not operate the UA from a moving vehicle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.4 The remote pilot should not hand the control of the UA over to another command unit.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
UA range limit	Self-declaration	1.5 Launch/recovery: At VLOS distance from the remote pilot, if not operating from a safe prepared area. *Note: 'safe prepared area' means a controlled ground area that is suitable for the safe launch/recovery of the UA.*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.6 In flight: The range limit should be within the coverage of the direct C2 link coverage (radio line of sight), which ensures the safe conduct of the flight.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
Overflown areas	Declaration supported by data	1.7 UAS operations should be conducted over sparsely populated areas.	*Please include a reference to the relevant chapter/section of the OM where the procedures for determining the population density are provided.*	'I declare compliance.' *Please describe how the population density data is identified.*
UA limitations		1.8 Maximum characteristic dimension (e.g. wingspan, rotor diameter/area or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Topic	Method of proof	Condition	Integrity[1]	Proof[2]
	Self-declaration	maximum distance between rotors in case of a multirotor): 3 m		

		1.9 Typical kinetic energy (as defined in paragraph 2.3.1(k) of AMC1 to Article 11 of the UAS Regulation: up to 34 kJ	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Flight height limit	Self-declaration	1.10 The maximum height of the operation volume is limited by the size of the reserved or segregated airspace. *Note: In addition to the vertical limit of the operational volume, an air risk buffer is to be considered (see 'Air risk' under point 3 of this table).*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Airspace	Self-declaration	1.11 Operations should only be conducted in airspace that is reserved or segregated for the purpose of conducting UAS operations (corresponding to an air risk that can be classified as ARC-a).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Visibility	Self-declaration	1.12 If take-off and landing are conducted in VLOS of the remote pilot, the visibility should be sufficient to ensure that no people are in danger during the take-off/landing phase. The remote pilot should abort the take-off or landing in case people on the ground are in danger.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
Others	Self-declaration	1.13 The UA should not be used to drop material or to carry dangerous goods, except for dropping items in connection with agricultural, horticultural or forestry activities where the carriage of such items does not contravene any other applicable regulations.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions					
Topic	**Method of proof**	**Condition**		**Integrity[1]**	**Proof[2]**
2. Operational risk classification (according to the classification defined in AMC1 to Article 11 of the UAS Regulation)					
Final GRC	**3**	**Final ARC**	**ARC-a**	**SAIL**	**II**
3. Operational mitigations					
Operational volume (see Figure 2 of AMC1 Article 11)	Self-declaration	3.1 To determine the operational volume, the UAS operator should consider the position-keeping capabilities of the UAS in 4D space (latitude, longitude, height, and time).		*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.2 In particular, the accuracy of the navigation solution, the flight technical error of the UAS, as well as the flight path definition error (e.g. map error) and latencies should be considered and addressed when determining the operational volume.		*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.3 The remote pilot should apply the emergency procedures as soon as there is an indication that the UA may exceed the limits of the operational volume.		*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Ground risk	Self-declaration	3.4 The UAS operator should establish a ground risk buffer to protect third parties on the ground outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4.1 The minimum criterion should be the use of the '1:1 rule' (e.g. if the UA is planned to operate at a height of 150 m, the ground risk buffer should at least be 150 m).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.5 The operational volume and the ground risk buffer should be all contained in a sparsely populated area.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		3.6 The applicant should evaluate the area of operations typically by means of an on-site inspection or appraisal, and should be able to justify a reduced density of people at risk in the operational area and the ground risk buffer.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Air risk	Self-declaration	3.7 The operational volume, including the air risk buffer, if applicable, should be entirely contained in the reserved or segregated airspace.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Observers		n/a		
4. UAS operator and UAS operations conditions				

UAS operator and UAS operations		4.1 The UAS operator should:		
		4.1.1 develop an operations manual (OM) (for the template, refer to AMC1 UAS.SPEC.030(3)(e) and to the complementary information in GM1 UAS.SPEC.030(3)(e));	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.2 develop procedures to ensure that the security requirements applicable to the area of operations are complied during the intended operation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.3 develop measures to protect the UAS against unlawful interference and unauthorised access;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
	Declaration supported by data	4.1.4 develop procedures to ensure that all operations comply with Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data; in particular, the UAS operator should	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		carry out a data protection impact assessment, when this is required by the data protection national authority of the Member State with regard to		

		the application of Article 35 of that Regulation;		
		4.1.5 develop guidelines for its remote pilots to plan UAS operations in a manner that minimises nuisance, including noise and other emissions-related nuisance, to people and animals;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.6 develop an emergency response plan (ERP) in accordance with the conditions for a 'medium' level of robustness (please refer to AMC3 UAS.SPEC.030(3)(e);	*Please describe how this condition is met.*	'I declare compliance and that the ERP is available to the Authority for review.'
		4.1.7 validate the operational procedures in accordance with the conditions for a 'medium' level of robustness, which are included in AMC2 UAS.SPEC.030(3)(e);	*Please describe how this condition is met.*	'I declare compliance and that the ERP is available to the Authority for review.'
		4.1.8 ensure the adequacy of the contingency and emergency procedures and prove it through any of the following: (a) dedicated flight tests; or (b) simulations, provided that the representativeness of the simulation means is proven for the intended purpose with positive results; or	*Please describe how this condition is met.*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'

PDRA characterisation and conditions				
Topic	Method of proof	Condition	Integrity[1]	Proof[2]
		(c) any other means acceptable to the Authority; and		
		4.1.9 have a policy that defines how the remote pilot and any other personnel in charge of duties essential to the UAS operation can declare themselves fit to operate before conducting any operation.	*Please describe how this condition is met.*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'
		4.1.10 designate for each flight a remote pilot with adequate competency and other personnel in charge of duties essential to the UAS operation if needed;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.11 ensure that the UAS operation effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.12 keep for a minimum of 3 years and maintain up to date a record of the information on UAS operations, including any unusual technical or operational occurrences and other data as required by the declaration or by the operational authorisation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that recordkeeping data is available to the Authority.'
		4.1.13 As part of the procedures contained in the OM (point 4.1.1 above), include the description of the following:		

		(a) The method and means of communication with the authority or entity responsible for the management of the airspace during the entire period of the reserved or segregated airspace	*Please describe how this condition is met*	'I declare compliance and that evidence is available to the Authority for review.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		being active, as mandated by the authorisation. *Note: The communication method should be published in the NOTAM activating the reserved airspace to also allow coordination with manned aircraft.*		
		(b) The member(s) of personnel in charge of duties essential to the UAS operation, who are responsible for establishing that communication.	*Please describe how this condition is met*	'I declare compliance and that evidence is available to the Authority for review.'
UAS maintenance	Self-declaration	4.2 The UAS operator should:		
		4.2.1 ensure that the UAS maintenance instructions that are defined by the UAS operator are included in the OM and cover at least the UAS manufacturer's instructions and requirements when applicable; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		4.2.2 ensure that the maintenance staff follow the UAS maintenance instructions when performing maintenance.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.3 keep for a minimum of 3 years and maintain up to date a record of the maintenance activities conducted on the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.4 establish and keep up to date a list of the maintenance staff employed by the operator to carry out maintenance activities;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		4.2.5 comply with point UAS.SPEC.100, if the UAS uses certified equipment.	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	I declare compliance.' or 'n/a'
External services	Self-declaration	4.3 The UAS operator should ensure that the level of performance for any externally provided service that is necessary for the safety of the flight is adequate for the intended operation. The UAS operator should declare that this level of performance is adequately achieved.	*Please describe how this condition is met.*	'I declare compliance.'
		4.4 The UAS operator should define and allocate the roles and responsibilities between the UAS operator and the	*Please describe how this condition is met.*	'I declare compliance.'

			external service provider(s), if applicable.		
5. Conditions for the personnel in charge of duties essential to the UAS operation					
General	Self-declaration	5.1	The UAS operator should ensure that all personnel in charge of duties essential to the UAS operation are provided with competency-based theoretical and practical training specific to their duties, which consists of the applicable theoretical elements derived from AMC1 UAS.SPEC.050(1)(d) and practical elements from AMC2 UAS.SPEC.050(1)(d) and UAS.SPEC.050(1)(e).	*Please describe this condition is met.*	'I declare compliance. ' Evidence of training are available for inspection at the request of the competent authority or its authorised representative. The training programme is documented in xxx'.
		5.2	The UAS operator should keep and maintain up to date a record of all the relevant qualifications and training courses completed by the remote pilot and the other personnel in charge of duties essential to the UAS operation and by the maintenance staff for at least 3 years after those persons have ceased	*Please describe how this condition is met.*	'I declare compliance.' Record-keeping data is available for inspection at the request of the Authority.

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		to be employed by the organisation or have changed position within the organisation.		

Remote pilot		5.3 The remote pilot should have the authority to cancel or delay any or all flight operations under the following conditions:	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.1 when the safety of persons is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.2 when property on the ground is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.3 when other airspace users are jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
	Self-declaration	5.3.4 when there is a violation of the terms of the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.4 The remote pilot should:		
		5.4.1 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;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.4.2 be familiar with the manufacturer's instructions provided by the manufacturer of the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.4.3 obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		5.4.4 ensure that the UAS is in a safe condition to complete the intended flight safely and, if applicable, check whether the direct remote identification is active and up to date.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Multi-crew cooperation (MCC)	Self-declaration	5.5 Where multi-crew cooperation (MCC) may be required, the UAS operator should:		
		5.5.1 designate a remote pilot-in-command to be responsible for each flight;	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.5.2 include procedures to ensure coordination between the remote crew members through robust and effective communication channels; those procedures should cover, as a minimum:	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.5.2.1 the assignment of tasks to the remote crew members; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.5.2.2 the establishment of step-bystep communication; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.6 ensure that the training of the remote crew covers MCC.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'

Maintenance staff	Declaration supported by data	5.7 Any staff member that is authorised by the UAS operator to perform maintenance activities should have been adequately trained in the documented maintenance procedures.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.' Evidence of training is available at the request of the Authority.
Personnel in charge of duties		5.8 The personnel in charge of duties essential to the UAS operation should	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
essential to the UAS operation are fit to operate		declare that they are fit to operate before conducting any operation, based on the policy that is defined by the UAS operator.		
6. Technical conditions				
General	Self-declaration	6.1 The UAS should be equipped with means to monitor the critical parameters of a safe flight, in particular the following:		
		6.1.1 the UA position, height or altitude, ground speed or airspeed, attitude, and trajectory;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.1.2 the UAS energy status (fuel, battery charge, etc.); and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		6.1.3 the status of critical functions and systems; as a minimum, for services based on RF signals (e.g. C2 link, GNSS, etc.), means should be provided to monitor the adequate performance and trigger an alert when the performance level becomes too low.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Human–machine interface (HMI)	Self-declaration	6.2 The UAS information and control interfaces should be clearly and succinctly presented and should not confuse, cause unreasonable fatigue, or contribute to causing any disturbance to the personnel in charge of duties essential to the UAS operation in such a way that could adversely affect the safety of the operation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.3 The UAS operator should conduct a UAS evaluation that considers and addresses human factors to determine whether the HMI is appropriate for the operation.	*Please describe how this condition is met.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
C2 links and communication	Self-declaration	6.4 The UAS should comply with the applicable requirements for radio equipment and the use of the RF spectrum.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		6.5 Protection mechanisms against interference should be used, especially if unlicensed bands (e.g. ISM) are used for the C2 link (mechanisms such as FHSS, DSSS or OFDM technologies, or frequency deconfliction by procedure).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.6 The UAS should be equipped with a C2 link that is protected against unauthorised access to the command-and-control functions.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.7 In case of loss of the C2 link, the UAS should have a reliable and predictable method to recover the command-and-control link of the UA or to terminate the flight in a way that reduces any undesirable effect on third parties in the air or on the ground.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.8 The UAS operator should ensure that reliable and continuous means of twoway communication for the purpose that is indicated in point 4.1.13(a) above are available.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Tactical mitigation		n/a		
Containment		6.9 To ensure a safe recovery from a technical issue that involves the UAS or an external system that supports the operation, the UAS should comply with		

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		the following basic containment provisions:		
	Declaration supported by data	6.9.1 no probable failure of the UAS or of any external system that supports the operation would lead to operation outside the operational volume; and	*Please describe how this condition is met*	applies.' ce enhanced containment or ' re compliance.' is avail gn and installation appraisal — able and it covers at least: the design and installation features (independence, separation, and — redundancy); and the particular risks (e.g. hail, ice, snow, electromagnetic interference, etc.) relevant to the type of operation. '
		6.9.2 it is reasonably expected that a fatality will not occur due to any probable failure of the UAS or of any external system that supports the operation. *Note: The term 'probable' should be understood in its qualitative interpretation, i.e. 'anticipated to occur one or more times during the entire system/operational life of an item'.*	*Please describe how this condition is met*	
	Declaration supported by data	6.10 The following enhanced containment conditions should apply if the adjacent area includes an assembly of people or if the adjacent airspace is classified as ARCd (in accordance with SORA):		
		6.10.1 The UAS should be designed to standards that are considered adequate by the Authority and/or in accordance with a means of compliance that is acceptable to that Authority such that:	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'n/a since basic containment applies.' or 'I declare compliance with MoC Light-UAS.2511. Analysis and/or test data with supporting evidence is available.' or

		6.10.1.1. the probability of the UA leaving the operational volume should be less than 10^{-4}/FH; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'The UAS has a DVR demonstrating compliance with the enhanced containment requirements.'
		6.10.1.2 no single failure of the UAS or of any external system that supports the operation should	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		lead to operation outside the ground risk buffer. *Note: The term 'failure' should be understood as an occurrence that affects the operation of a component, part, or element in such a way that it can no longer function as intended. Errors may cause failures but are not considered to be failures. Some structural or mechanical failures may be excluded from the criterion if it can be shown that these mechanical parts were designed according to aviation industry best practices.*		

		6.10.2 SW and AEH whose development error(s) could directly lead to operations outside the ground risk buffer should be developed according to an industry standard or methodology that is recognised as adequate by EASA. *Note 1: The proposed additional safety conditions cover both the integrity and the assurance levels.* *Note 2: The proposed additional safety conditions do not imply a systematic need to develop the SW and AEH according to an industry standard or methodology that is recognised as adequate by the Authority. For instance, if the UA design includes an <u>independent</u> engine shutdown function that systematically prevents the UA from exiting the ground risk buffer due to single failures or an SW/AEH error of the flight controls from*	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	
PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[9]**	**Proof[10]**
		occurring, the intent of the conditions of point 6.10.1 above could be considered met		

[9] Applicable from 1 July 2022.

[10] Applicable from 1 July 2022.

Remote identification[1]	Self-declaration	6.11 The UAS has a unique serial number compliant with standard ANSI/CTA2063-A-2019, Small Unmanned Aerial Systems Serial Numbers, 2019, according to Article 40(4) of Regulation (EU) 2019/945	*Please describe how this condition is met.*	'I declare compliance.'
		6.12 The UAS is equipped with a remote identification system according to Article 40(5) of Regulation (EU) 2019/945.	*Please describe how this condition is met.*	'I declare compliance.'
Lights[2]	Self-declaration	6.13 If the UAS is operated at night, it is equipped with at least one green flashing light according to point UAS.SPEC.050(1)(l)(i) of the UAS Regulation.	*Please describe how this condition is met or indicate 'n/a'.*	'I declare compliance.' or 'n/a'

Table PDRA-G02.1 — Main limitations and conditions for PDRA-G02

AMC4 Article 11 Rules for conducting an operational risk assessment

PREDEFINED RISK ASSESSMENT PDRA-S01 Version 1.2 EDITION September 2023

(a) Scope

This PDRA addresses the same type of operations that are covered by the standard scenario STS-01 (Appendix 1 to the Annex to the UAS Regulation); however, it provides the UAS operator with the flexibility to use UASs that do not need to be marked as class C5.

This PDRA addresses UAS operations that are conducted:

(1) with UA with maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between the rotors tips in the case of a multirotor) of up to 3 m;

(2) in VLOS of the remote pilot;

(3) over a controlled ground area that might be located in a populated area;

(4) below 150 m above ground level (AGL) (except when close to obstacles); and

(5) in controlled or uncontrolled airspace, provided that there is a low probability of encountering manned aircraft.

(b) PDRA characterisation and conditions

The characterisation and conditions for this PDRA are summarised in Table PDRA-S01.1 below:

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[11]**	**Demonstration of assurance[12]**
1. Operational characterisation (scope and limitations)				
Level of human intervention	Self-declaration	1.1 No autonomous operations: the remote pilot should have the ability to maintain control of the UA, except in case of a loss of the command-and control (C2) link.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.2 The remote pilot should operate only one UA at a time.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

[11] To be filled in by the UAS operator.

[12] To be filled in by the UAS operator.

		1.3 The remote pilot should not operate the UA from a moving vehicle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.4 The remote pilot should not hand the control of the UA over to another command unit.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
UA range limit	Self-declaration	1.5 VLOS distance from the remote pilot at all times.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Overflown areas	Self-declaration	1.6 UAS operations should be conducted over a controlled ground area.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.7 For the operation of a tethered UA, the area should have a radius equal to the tether length plus 5 m, and should be centred on the point of the surface of the Earth where the tether is fixed.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.8 The UA should have a maximum characteristic dimension (e.g. wingspan, rotor diameter/area or maximum distance between rotors' tips in the case of a multirotor) of less than 3 m.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Flight height limit		1.9 The remote pilot should maintain the UA within 120 m (unless making use of the option defined in point 1.12) from the closest point of the surface of the Earth. The	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
	Self-declaration	measurement of the distances should be adapted according to the geographical characteristics of the terrain, such as plains, hills, and mountains.		

		1.10 When flying a UA within a horizontal distance of 50 m from an artificial obstacle that is taller than 105 m, the maximum height of the UAS operation may be increased up to 15 m above the height of the obstacle, at the request of the entity responsible for the obstacle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.11 When UAS operators intend to operate at a height above 120 m, up to 150 m, they should define a risk buffer according to point 3.8 below.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Airspace		1.12 The UA should be operated:		
		1.12.1 in uncontrolled airspace, unless different limitations are provided for by the Member States for their UAS geographical zones in areas where the probability of encountering manned aircraft is not low; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
	Self-declaration	1.12.2 in controlled airspace after coordination and flight authorisation in accordance with the published procedures for the area of operation, to ensure that the probability of encountering manned aircraft is low. *Note: Airspace with an air risk that is classified as not higher than ARC-b can be considered having a low probability of encountering manned aircraft.*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Visibility	Self-declaration	1.13 The flight visibility should allow the remote pilot to conduct the entire flight in VLOS.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions

Topic	Assurance level	Condition	Demonstration of integrity[1]	Demonstration of assurance[2]
Others	Self-declaration	1.14 The UA should not be used to carry dangerous goods, except for dropping items in connection with agricultural, horticultural or forestry activities where the carriage of such items does not contravene any other applicable regulations. Note: The operator shall comply with applicable national or international regulations on the use of plant protection products, chemicals, dangerous substances, and preparations as appropriate. This includes Directive 2009/128/EC establishing a framework for Community action to achieve the sustainable use of pesticides, if applicable.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
2. Operational risk classification (according to the classification defined in AMC1 to Article 11 of the UAS Regulation)				
Final GRC	**3**	**Final ARC**	**ARC-b**	**SAIL**	**II**
3. Operational mitigations				
Operational and adjacent volume (see Figure 2 of AMC1 Article 11)	Self-declaration	3.1 The UAS operator should define the operational volume, ground risk buffer and adjacent volume for the intended operation, including:	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.1.1 the flight geography; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		3.1.2 the contingency volume, with its external limit(s) at least 10 m beyond the limit(s) of the flight geography if the operation is conducted with untethered UA.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.2 To determine the operational volume, the UAS operator should consider the positionkeeping capabilities of the UAS in 4D space (latitude, longitude, height, and time).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		3.3 In particular, the accuracy of the navigation solution, the flight technical error of the UAS, as well as the flight path definition error (e.g. map error) and latencies should be considered and addressed when determining the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4 The size of adjacent volume should be defined.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.5 The remote pilot should apply emergency procedures as soon as there is an indication that the UA may exceed the limits of the operational volume, as per point 5.3.9(d) below.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		3.6	No persons should be overflown when spraying liquids or dropping substances. Infrastructure or facilities can be overflown on request of the entity responsible for the infrastructure or facility.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Ground risk	Self-declaration	3.7	The UAS operator should establish a ground risk buffer to protect third parties on the ground outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.8	For the operation of untethered UA, the ground risk buffer should cover a distance beyond the external limit(s) of the contingency area. That distance should be at least as defined below:	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

<table>
<tr><th colspan="5">PDRA characterisation and conditions</th></tr>
<tr><th>Topic</th><th>Assurance level</th><th>Condition</th><th>Demonstration of integrity[13]</th><th>Demonstration of assurance[2]</th></tr>
<tr><td></td><td></td><td>
<table>
<tr><th rowspan="2">Max height AGL[1]</th><th colspan="2">Minimum distance for ground risk buffer</th></tr>
<tr><th>with MTOM of up to 10 kg</th><th>with MTOM greater than 10 kg</th></tr>
<tr><td>10 m</td><td>5 m</td><td>10 m</td></tr>
<tr><td>30 m</td><td>10 m</td><td>20 m</td></tr>
<tr><td>60 m</td><td>15 m</td><td>30 m</td></tr>
<tr><td>90 m</td><td>20 m</td><td>45 m</td></tr>
<tr><td>120 m</td><td>25 m</td><td>60 m</td></tr>
<tr><td>150 m</td><td>30 m</td><td>75 m</td></tr>
</table>
</td><td></td><td></td></tr>
<tr><td></td><td></td><td>3.9 For the operation of tethered UA, the ground risk buffer is considered in point 1.7 above.</td><td>Please include a reference to the relevant chapter/section of the OM.</td><td>‘I declare compliance.’</td></tr>
<tr><td></td><td></td><td>3.10 If the UAS operation is performed above 120 m and up to 150 m, the UAS operator should:</td><td></td><td></td></tr>
</table>

[13] The closest point from the Earth should be considered.

Air risk	Declaration supported by data	3.10.1 establish an air risk buffer to protect third parties in the air outside the operational volume; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance and that supporting evidence is included in the OM.' Justification supporting the reduction of the air risk buffer is documented in […] or 'n/a'.

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[14]**	**Demonstration of assurance[2]**
		3.10.2 if the air risk buffer is part of controlled airspace, coordinate the operation with the respective ANSP;	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance and that supporting evidence is included in the OM.' 'or n/a'

[14] The UAS operator should demonstrate that they have sufficient confidence in the accuracy of the information about the height of the UA and the means to advert and avoid other airspace users and obstacles in the vicinity of the UA.

		3.10.3 develop appropriate procedures to not jeopardise other airspace users.	*Please include a reference to the relevant chapter/section of the OM. Please describe how the remote pilots and, if employed, the AOs are able to assess the height of the UA compared to other airspace users[1], otherwise indicate 'n/a'.*	'I declare compliance and that supporting evidence is included in the OM.' 'or n/a'
	Self-declaration	3.11 The operational volume should be outside any geographical zone corresponding to a flight restriction zone of a protected aerodrome or of any other type, as defined by the responsible authority, unless the UAS operator has been granted appropriate permission.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.12 Prior to the flight, the UAS operator should assess the proximity of the planned operation to manned aircraft activity.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.13 The UAS operator should establish a deconfliction scheme that allows the remote pilot to take efficient decisions in case of incoming traffic.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Observers		3.14 Airspace observers (AOs): n/a UA observers: refer to point 5.3.9(b) below.		
4. UAS operator and UAS operations conditions				
		4.1 The UAS operator should:		
PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**

UAS operator and UAS operations	Declaration supported by data	4.1.1 develop an operations manual (OM) (for the template, refer to AMC1 UAS.SPEC.030(3)(e) and to the complementary information in GM1 UAS.SPEC.030(3)(e));	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.2 define, and include in the OM, the procedure to determine the operational volume and ground risk buffer for the intended operation, as per points 3.1 to 3.6 above, and the adjacent volume;	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.3 develop procedures to ensure that that the operation is conducted safely and the security requirements applicable to the area of operations are complied with during the intended operation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.4 develop measures to protect the UAS against unlawful interference and unauthorised access;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

		4.1.5 develop procedures to ensure that all operations comply with Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. In particular, the UAS operator should carry out a data protection impact assessment, when this is required by the data protection national authority of the Member State with regard to the application of Article 35 of that Regulation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		4.1.6 develop guidelines for its remote pilots to plan UAS operations in a manner that minimises nuisance, including noise and other emissions-related nuisance, to people and animals;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.7 ensure the adequacy of the contingency and emergency procedures and prove it through any of the following: (a) dedicated flight tests; or (b) simulations, provided that the representativeness of the simulation means is proven valid for the intended purpose with positive results; or	*Please describe how this condition is met*	'I declare compliance and that evidence is available to the Authority for review.'

		(c) any other means acceptable to the Authority;		
		4.1.8 develop an effective emergency response plan (ERP) that is suitable for the intended operation (see GM1 UAS.SPEC.030(3)(e));	*Please describe how this condition is met*	'I declare compliance and that evidence is available to the Authority for review.'
		4.1.9 upload updated information into the geoawareness function, if such system is installed on the UAS, when required by the UAS geographical zone for the intended location of the operation;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.10 ensure that before starting the operation, the controlled ground area is in place, effective, and compliant with the minimum distance that is defined in points 3.1 and 3.5 above and, when required, coordination with the appropriate authorities has been established;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**

		4.1.11 ensure that before starting the operation, all persons that are present in the controlled ground area:		
		(a) have been informed of the risks of the operation;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		(b) have been briefed on or trained in, as appropriate, the safety precautions and measures that the UAS operator has established for their protection; and	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		(c) have explicitly agreed to participate in the operation; and	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.12 designate for each flight a remote pilot with adequate competency and other personnel in charge of duties essential to the UAS operation if needed;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.13 in case the operation takes place in a controlled airspace, as part of the procedures that are contained in the OM (point 4.1.1 above), include the description of the following: (a) the method and means of communication with the authority or entity responsible for the management of the airspace during the entire period of operation; (b) the member(s) of personnel in charge of duties essential to the UA operation, who are responsible	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

		for establishing that communication;		

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		4.1.14 ensure that the UAS operation effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.15 keep for a minimum of 3 years and maintain up to date a record of the information on UAS operations, including any unusual technical or operational occurrences and other data as required by the declaration or by the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that recordkeeping data is available to the Authority.'
	Self-declaration	4.2 The UAS operator should:		

UAS maintenance		4.2.1 ensure that the UAS maintenance instructions that are defined by the UAS operator are included in the OM and cover at least the UAS manufacturer's instructions and requirements when applicable; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.2 ensure that the maintenance staff follow the UAS maintenance instructions when performing maintenance;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.3 keep for a minimum of 3 years and maintain up to date a record of the maintenance activities conducted on the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.4 establish and maintain up to date a list of the maintenance staff employed by the operator to carry out maintenance activities;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.5 comply with point UAS.SPEC.100, if the UAS uses certified equipment.	*Please include a reference to the relevant chapter/section of the OM or n/a.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**

External services	Self-declaration	4.3 The UAS operator should ensure that the level of performance for any externally provided service that is necessary for the safety of the flight is adequate for the intended operation. The UAS operator should declare that this level of performance is adequately achieved.	*Please describe how this condition is met.*	'I declare compliance.'
		4.4 The UAS operator should define and allocate the roles and responsibilities between the UAS operator and the external service provider(s), if applicable.		
5. Conditions for the personnel in charge of duties essential to the UAS operation				
General		5.1 The UAS operator should keep and maintain up to date a record of all the relevant qualifications and training courses completed by the remote pilot and the other personnel in charge of duties essential to the UAS operation and by the maintenance staff for at least 3 years after those persons have ceased to be employed by the organisation or have changed position within the organisation.	*Please describe how this condition is met.*	'I declare compliance.' Record-keeping data is available for inspection at the request of the Authority.
		5.2 The remote pilot should have the authority to cancel or delay any or all flight operations under the following conditions:		
		5.2.1 the safety of persons is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.2.2 property on the ground is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		5.2.3 other airspace users are in jeopardy; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.2.4 there is a violation of the terms of the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Remote pilot	Self-declaration	5.3 The remote pilot should:		
		5.3.1 not perform any 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;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.2 be familiar with the manufacturer's instructions provided by the manufacturer of the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.3 ensure that the UA remains clear of clouds;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.4 hold a certificate of remote pilot theoretical knowledge, in accordance with Attachment A to Chapter I of Appendix 1 to the Annex to the UAS Regulation, which is issued by the Authority or by an entity that is designated by the Authority of a Member State;	*Please describe how this condition is met.*	'I declare compliance.' or 'n/a'

		5.3.5 hold an accreditation of completion of a practical-skills training course for this PDRA, in accordance with Attachment A to Chapter I of Appendix 1 to the Annex to the UAS Regulation, which is issued by: (a) an entity that has declared compliance with the requirements of Appendix 3 to the Annex to the UAS Regulation and is recognised by the	*Please describe how this condition is met.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		Authority of a Member State; or (b) a UAS operator that has been authorised by the Authority of the Member State of registration to operate according to this PDRA (or declared to the same Authority, compliance with STS-01) and with the requirements of Appendix 3 to the Annex to the UAS Regulation.		
		5.3.6 If operations are conducted at a height between 120 and 150 m, the remote pilot should undergo additional theoretical knowledge training in the following topics:		

		(a) raising awareness about the air risk and about the existence of other airspace users;	*Please describe how this condition is met.*	'I declare compliance and that the training syllabus is available for inspection at the request of the Authority.'
		(b) checking height determination/ limitation devices; and	*Please describe how this condition is met.*	'I declare compliance and that the training syllabus is available for inspection at the request of the Authority.'
		(c) using applicable procedures in case a manned aircraft is detected.	*Please describe how this condition is met.*	'I declare compliance and that the training syllabus is available for inspection at the request of the Authority.'
		5.3.7 As an alternative to holding a certificate of remote pilot theoretical knowledge, according to point 5.3.4, and to holding an accreditation of completion of a practical-skills training course according	*Please describe how this condition is met.*	'I declare compliance and that the training syllabus is available for inspection at the request of the Authority.' or

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		to point 5.3.5, the operator may propose a dedicated training syllabus to the Authority;		'n/a'.
		5.3.8 Before starting the UAS operation, the remote pilot should:		
		(a) verify that the means to terminate the UA flight and the remote identification system are operational;	*Please describe how this condition is met.*	'I declare compliance.'

		(b) obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15 of the UAS Regulation; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(c) ensure that the UAS is in a safe condition to complete the intended flight safely and, if applicable, check whether the direct remote identification is active and up to date.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.9 During the flight:		
		(a) keep the UA in VLOS and maintain thorough visual scan of the airspace that surrounds the UA to avoid any risk of collision with manned aircraft; the remote pilot should discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property;	*Please describe how this condition is met.*	'I declare compliance.'
		(b) for the purpose of point (a) above, possibly being assisted by a UA	*Please describe how this condition is met.*	'I declare compliance.'
PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[15]**	**Demonstration of assurance[16]**

[15] Please refer to point UAS.STS-02.050 for the responsibilities of the UA observer.

[16] Applicable from 1 July 2022.

		observer[1]; clear and effective communication should be established between the remote pilot and the UA observer;		
		(c) use the contingency procedures that are defined by the UAS operator for abnormal situations, including situations where the remote pilot has an indication that the UA may exceed the limits of the flight geography; and	*Please describe how this condition is met.*	'I declare compliance.'
		(d) use the emergency procedures that are defined by the UAS operator for emergencies, including triggering the means to terminate the flight when the remote pilot has an indication that the UA may exceed the limits of the operational volume; the means to terminate the flight should be triggered at least 10 m before the UA reaches the limits of the operational volume;	*Please describe how this condition is met.*	'I declare compliance.'
		(e) keep the UA at a ground speed of less than 5 m/s in case of untethered UA;	*Please describe how this condition is met.*	'I declare compliance.'
		(f) activate the direct remote identification system[2].	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
6. Technical conditions				
UAS		6.1 The UAS operator should use a UAS marked as class C5 and complies with the requirements of that class, as defined in		'I declare that the UAS is marked with a class C5 identification label.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[17]**	**Demonstration of assurance[2]**
	Self-declaration[1]	Part 16 of the Annex to Regulation (EU) 2019/945.		

[17] The containment requirements (reference to point 5 of Part 16 of Regulation (EU) 2019/945) should be demonstrated with a medium assurance level.

		6.2 As an alternative to point 6.1, the UAS operator may use a UAS that complies with the requirements of Part 16 of the Annex to Regulation (EU) 2019/945, except that the UAS does not need to: • bear a class C3 UAS or a class C5 UAS identification label; • have an MTOM of less than 25 kg; • be exclusively powered by electricity, if the UAS operator ensures that the environmental impact that is caused by the use of non-electric UAS is minimised; • include an information notice that is published by EASA and provides the applicable limitations and obligations, as required by the UAS Regulation; and • include the manufacturer's instructions for the UAS, if it is privately built; however, information on its operation and maintenance, as well as on the training of the remote pilot, should be included in the OM. **Note 1**: The UAS can comply with point (9) of Part 4 of the Annex to Regulation (EU) 2019/945 by using an add-on that complies with Part 6 of the Annex to that Regulation.	*Please describe how this condition is met.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		Note 2: If the UA does not bear a physical serial number that is compliant with standard ANSI/CTA 2063-A 'Small Unmanned Aerial Systems Serial Numbers' and/or does not have an integrated system of direct remote identification, it can comply with point (9) of Part 4 of the Annex to Regulation (EU) 2019/945 by using an add-on that complies with Part 6 of the Annex to that Regulation.		
		6.3 In addition, if: • the adjacent area does not include a populated area or an assembly of people; and • the adjacent airspace is classified as ARCa or ARC-b, point 5 of Part 16 of the Annex to Regulation (EU) 2019/945 may be replaced with the following basic containment conditions: • no probable failure of the UAS or of any external system that supports the operation would lead to operation outside the operational volume; and • it is reasonably expected that a fatality will not occur due to any probable failure of the UAS or of any external system that supports the operation.	*Please describe how this condition is met.*	'Basic containment applies and I declare that a design and installation appraisal is available and it covers at least: — the design and installation features (independence separation, and redundancy); and — the particular risks (e.g. hail, ice, snow, electromagnetic interference, etc.) relevant to the type of operation.' or 'Enhanced containment applies and I declare compliance with MoC LightUAS.2511. Analysis and/or test data with supporting evidence is available.' or 'The UAS has a DVR demonstrating compliance with the enhanced containment requirements.'

PDRA characterisation and conditions				
Topic	**Assurance level**	**Condition**	**Demonstration of integrity[1]**	**Demonstration of assurance[2]**
		6.4 If designed to spray, the UA should:		
		6.4.1 be designed to avoid an accidental release of any substance;		
		6.4.2 have means for the remote pilot to immediately stop the spraying of liquids or dropping of substances in case of an emergency.		

Table PDRA-S01.1 — Main limitations and conditions for PDRA-S01

AMC5 Article 11 Rules for conducting an operational risk assessment

PREDEFINED RISK ASSESSMENT PDRA-S02 Version 1.1 EDITION January 2022

(a) Scope

This PDRA addresses the same type of operations that are covered by the standard scenario STS-02 (Appendix 1 to the Annex to the UAS Regulation); however, it provides the UAS operator with the flexibility to use UASs that do not need to be marked as class C6.

This PDRA addresses UAS operations that are conducted:

(1) with UA with maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of a multirotor) of up to 3 m and MTOM of up to 25 kg;

(2) at a distance of up to 2 km from the remote pilot if airspace observers (AOs) are employed; otherwise at a distance of up to 1 km;

(3) over a controlled ground area that is entirely located in a sparsely populated area;

(4) below 150 m above ground level (AGL) (except when close to obstacles); and

(5) in controlled or uncontrolled airspace, provided that there is a low probability of encountering manned aircraft1.

(b) PDRA characterisation and conditions

The characterisation and conditions for this PDRA are summarised in Table PDRA-S02.1 below:

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[18]**	**Proof[19]**
1. Operational characterisation (scope and limitations)				
Level of human intervention	Self-declaration	1.1 No autonomous operations: the remote pilot should maintain control of the UA, except in case of a loss of the command-and-control (C2) link.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.2 The remote pilot should operate only one UA at a time.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.3 The remote pilot should not operate the UA from a moving vehicle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.4 The remote pilot should not hand the control of the UA over to another command unit.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
UA range limit	Self-declaration	1.5 UAS operations should be conducted:		
		1.5.1 keeping the UA in sight of the remote pilot during the launch and recovery of the UA, unless the recovery of the UA is the result of an emergency flight termination;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.5.2 if no airspace observer (AO) is employed in the operation, with the UA no further than 1 km from the remote pilot; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.5.3 if one or more AOs are employed in the operation, with the UA no further than 2 km from the remote pilot.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

[18] To be filled in by the UAS operator.

[19] To be filled in by the UAS operator.

Overflown areas	Self-declaration	1.6 UAS operations should be conducted over a controlled ground area.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
UA limitations	Self-declaration	1.7 The UA should have an MTOM of less than 25 kg, including payload.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.8 The UA should have maximum characteristic dimensions (e.g. wingspan, rotor diameter/area	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		or maximum distance between rotors in case of a multirotor) of less than 3 m.		
		1.9 The UA should have a maximum ground speed in level flight of not more than 50 m/s.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Flight height limit	Self-declaration	1.10 The remote pilot should maintain the UA within 120 m (unless making use of the option defined in point 1.12) from the closest point of the surface of the Earth. The measurement of the distances should be adapted according to the geographical characteristics of the terrain, such as plains, hills, and mountains.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.11 When flying a UA within a horizontal distance of 50 m from an artificial obstacle that is taller than 105 m, the maximum height of the UAS operation may be increased up to 15 m above the height of the obstacle at the request of the entity that is responsible for the obstacle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		1.12 The UAS operator may propose to operate at a height above 120 m, but up to 150 m. In that case, the UAS operator should define a risk buffer according to point 3.7 below.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Airspace		1.13 The UA should be operated:		
		1.13.1 in uncontrolled airspace, unless different limitations are provided for by the Member States for their UAS geographical zones in areas where the probability of encountering manned aircraft is not low; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.13.2 in controlled airspace after coordination and flight authorisation in accordance with the published procedures for the area of operation, to ensure that the probability of encountering manned aircraft is low.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		Note: Airspace with an air risk that is classified as not higher than ARC-b can be considered having a low probability of encountering manned aircraft.		
Visibility	Self-declaration	1.14 The UA operation should be conducted in an area where the flight visibility is greater than 5 km. *Note: Please refer to* GM1 UAS.STS-02.020(3)*.*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Others	Low	1.15 The UA should not be used to carry dangerous goods, except for dropping items in connection with agricultural, horticultural or forestry activities where the carriage of such items does not contravene any other applicable regulations.			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
2. Operational risk classification (according to the classification defined in AMC1 to Article 11 of the UAS Regulation)						
Final GRC	**3**	**Final ARC**	**ARC-b**	**SAIL**	**II**	
3. Operational mitigations						
Operational volume (see Figure 2 of AMC1 Article 11)	Self-declaration	3.1 The UAS operator should define the operational volume for the intended operation, including the flight geography and the contingency volume.			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.2 To determine the operational volume, the UAS operator should consider the position-keeping capabilities of the UAS in 4D space (latitude, longitude, height, and time).			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.3 In particular, the accuracy of the navigation solution, the flight technical error of the UAS, as well as the flight path definition error (e.g. map error) and latencies should be considered and addressed when determining the operational volume.			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4 The remote pilot should apply emergency procedures as soon as there is an indication that			*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		the UA may exceed the limits of the operational volume, as per point 5.3.10(h) below.		
Ground risk	Self-declaration	3.5 The UAS operator should establish a ground risk buffer to protect third parties on the ground outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.
		3.6 The ground risk buffer should cover a distance that is at least equal to the distance most likely to be travelled by the UA after activation of the flight termination system specified by the UAS manufacturer's instructions, considering the operational conditions within the limitations specified by the UAS manufacturer.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.
Air risk	Declaration supported by data	3.7 If the UAS operation is performed above 120 m and up to 150 m, the UAS operator should:		
		3.7.1 establish an air risk buffer to protect third parties in the air outside the operational volume; and	*Please include a reference to the relevant chapter/section of the OM, or otherwise indicate 'n/a'.*	'I declare compliance.' Justification supporting reductionthe the air risk buffer is documented […]. or 'n/a'
		3.7.2 if the air risk buffer is part of controlled airspace, coordinate the operations with the respective ANSP.	*Please include a reference to the relevant chapter/section of the OM, or otherwise indicate 'n/a'.*	'I declare compliance and that supporting evidence is included in the OM.' […]. or 'n/a'

		3.7.3 develop appropriate procedures to not jeopardise other airspace users.	*Please include a reference to the relevant chapter/section of the OM.* *Please describe how the remote pilots and, if employed, the AOs are able to assess the height of the UA compared to other airspace users[20], or otherwise indicate 'n/a'.*	'I declare compliance and that supporting evidence is included in the OM.' […]. or 'n/a'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
	Self-declaration	3.8 The operational volume should be outside any geographical zone corresponding to a flight restriction zone of a protected aerodrome or of any other type, as defined by the responsible authority, unless the UAS operator has been granted appropriate permission.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.
		3.9 Prior to the flight, the UAS operator should assess the proximity of the planned operation to manned aircraft activity.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.
	Self-declaration	3.10 If the UAS operator decides to employ one or more airspace observers (AOs), the UA may be operated at a distance from the remote pilot greater than that referred to in point 1.5.2 above.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.

[20] The UAS operator should demonstrate that they have sufficient confidence in the accuracy of the information about the height of the UA and the means to advert and avoid other airspace users and obstacles in the vicinity of the UA.

Observers[21]		3.11 In relation to AOs, the UAS operator should comply with the conditions of point 4.1.15 below.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.
		3.12. AOs should comply with the conditions of point 5.4 below.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.
UAS operator and UAS operations conditions				
UAS operator and UAS operations	Declaration supported by data	4.1 The UAS operator should:		
		4.1.1 develop an operations manual (OM) (for the template, refer to AMC1 UAS.SPEC.030(3)(e) and to the complementary information in GM1 UAS.SPEC.030(3)(e));	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.2 define the operational volume and ground risk buffer for the intended operation, as per points 3.1 to 3.6 above, and include them in the OM;	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity**[69]	**Proof**[70]
		4.1.3 develop procedures to ensure that the security requirements applicable to the area of operations are complied with during the intended operation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

[21] Please refer to point UAS.STS-02.050 for the AO's main responsibilities.

		4.1.4 develop measures to protect the UAS against unlawful interference and unauthorised access;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.5 develop procedures to ensure that all operations comply with Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. In particular, the UAS operator should carry out a data protection impact assessment, when this is required by the data protection national authority of the Member State with regard to the application of Article 35 of that Regulation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.6 develop guidelines for its remote pilots to plan UAS operations in a manner that minimises nuisance, including noise and other emissions-related nuisance, to people and animals;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.7 ensure the adequacy of the contingency and emergency procedures and prove it through any of the following: (a) dedicated flight tests; or (b) simulations, provided that the representativeness of the simulation means is proven for the intended purpose with positive results; or any (c) other means acceptable to the Authority;	*Please describe how this condition is met.*	'I declare compliance and evidence is available to the competent authority for review.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		4.1.8 develop an emergency response plan (ERP) that is suitable for the intended operation in accordance with the conditions for a 'medium' level of robustness (please refer to AMC3 UAS.SPEC.030(3)(e);	*Please describe how this condition is met*	'I declare compliance and that the ERP is available to the Authority for review.'
		4.1.9 upload updated information into the geo-awareness function, if such system is installed on the UAS, when required by the UAS geographical zone for the intended location of the operation;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.10 ensure that before starting the operation, the controlled ground area is in place, effective, and compliant with the minimum distance that is defined in points 3.1 and 3.6 above and, when required, coordinate with the appropriate authorities;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.11 ensure that before starting the operation, all persons that are present in the controlled ground area:		
		(a) have been informed of the risks of the operation;	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		(b) have been briefed on or trained in, as appropriate, the safety precautions and measures that the UAS operator has established for their protection; and	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		(c) have explicitly agreed to participate in the operation;	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'

		4.1.12 designate for each flight a remote pilot with adequate competency and other personnel in charge of duties essential to the UAS operation if needed;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		4.1.13 ensure that the UAS operation effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.14 keep for a minimum of 3 years and maintain up to date a record of the information on UAS operations, including any unusual technical or operational occurrences and other data as required by the declaration or by the operational authorisation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that record-keeping data is available to the Authority.'
		4.1.15 before starting the operation, and if airspace observers (AOs) are employed:		
		(a) ensure the correct placement and the appropriate number of AOs along the intended flight path;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		(b) verify that:		
		(i) the visibility and the planned distance of the AOs are within the acceptable limits as defined in the OM;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		(ii) there are no potential terrain obstructions for each AO;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'

		(iii) there are no gaps between the zones that are covered by each of the AOs;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		(iv) the communication with each AO is established and effective;	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		(v) if means are used by the AOs to determine the position of the UA, those means are functioning and effective; and	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		(c) ensure that the AOs have been briefed on the planned flight path of the UA and on the associated timing.	*Please describe how this condition is met*	'I declare compliance and that supporting evidence is included in the OM.'
		4.2 If no AO is employed in the operation, the operation should be conducted with the UA flying no further from the remote pilot than the distance that is indicated in point 1.5.2 above and following a preprogrammed trajectory when the UA is not in the VLOS of the remote pilot	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.3 If one or more AOs are employed in the operation, the following conditions should be complied with:		

		4.3.1 the AO(s) should be positioned so as to adequately cover the operational volume and the surrounding airspace, having the minimum flight visibility that is indicated in point 1.14 above;	Please describe how this condition is met.	'I declare compliance and that supporting evidence is included in the OM.'
		4.3.2 the UA should be operated no further than 1 km from the AO who is nearest to the UA;	Please describe how this condition is met.	'I declare compliance and that supporting evidence is included in the OM.'
		4.3.3 the distance between any AO and the remote pilot should not be greater than 1 km; and	Please describe how this condition is met.	'I declare compliance and that supporting evidence is included in the OM.'
		4.3.4 robust and effective means are available for communication between the remote pilot and the AO(s).	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
UAS maintenance		4.4. The UAS operator should:		
		4.4.1 ensure that the UAS maintenance instructions that are defined by the UAS operator are included in the OM and cover at least the UAS manufacturer's instructions and requirements when applicable; and	*Please describe how this condition is met.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		4.4.2 that maintenance staff follow the UAS maintenance instructions when performing maintenance;	*Please describe how this condition is met.*	'I declare compliance.'
	Self-declaration	4.4.3 keep for a minimum of 3 years and maintain up to date a record of the maintenance activities conducted on the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		4.4.4 establish and maintain up to date a list of the maintenance staff employed by the operator to carry out maintenance activities;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.4.5 comply with point UAS.SPEC.100, if the UAS uses certified equipment.	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'*	'I declare compliance.' or 'n/a'
External services	Self-declaration	4.5 The UAS operator should ensure that the level of performance for any externally provided service that is necessary for the safety of the flight is adequate for the intended operation. The UAS operator should declare that this level of performance is adequately achieved.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.6 The UAS operator should define and allocate the roles and responsibilities between the UAS operator and the external service provider(s), if applicable.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
5. Conditions for the personnel in charge of duties essential to the UAS operation				
General		5.1 The UAS operator should keep and maintain up to date a record of all the relevant qualifications and training courses completed by the remote pilot and other personnel in charge of duties essential to the UAS operation and by the maintenance staff for at least 3 years after those persons have ceased to be employed by the organisation or have changed position within the organisation.	*Please describe how this condition is met*	'I declare compliance.' Record-keeping data is available for inspection at the request of the Authority.

PDRA characterisation and conditions

Topic	Method of proof	Condition	Integrity[69]	Proof[70]
		5.2 The remote pilot should have the authority to cancel or delay any or all flight operations under the following conditions:		
		5.2.1 the safety of persons is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.2.2 property on the ground is jeopardised; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.2.3 other airspace users are in jeopardy; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.2.4 there is a violation of the terms of the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Remote pilot	Self-declaration	5.3 The remote pilot should:		
		5.3.1 not perform any 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;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.2 be familiar with the manufacturer's instructions provided by the manufacturer of the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.3 ensure that the UA remains clear of clouds; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.4 hold a certificate of remote pilot theoretical knowledge, in accordance with Attachment A to Chapter II of Appendix 1 to the Annex to the UAS Regulation, which is issued by the Authority or by an entity that	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		is designated by the Authority of a Member State;		
		5.3.5 hold an accreditation of completion of a practical-skills training course for this PDRA, in accordance with Attachment A to Chapter	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		I of Appendix 1 to the Annex to the UAS Regulation, which is issued by: (a) an entity that has declared compliance with the requirements of Appendix 3 to the Annex to the UAS Regulation and is recognised by the Authority of a Member State; or (b) a UAS operator that has been authorised by the Authority of the Member State of registration to operate according to this PDRA (or declared to the same Authority compliance with STS-01) and with the requirements of Appendix 3 to the Annex to the UAS Regulation;		

		5.3.6 if operations are conducted at a height between 120 and 150 m, receive additional theoretical knowledge training in the following topics:		
		(a) raising awareness about the air risk and about the existence of other airspace users;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(b) checking height determination/ limitation devices;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(c) using procedures for the coordination between the remote pilot and the AO(s);	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(d) using the applicable procedures in case a manned aircraft is detected;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.7 obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15 of the UAS Regulation; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		5.3.8 ensure that the UAS is in a safe condition to complete the intended flight safely and, if applicable, check whether the direct remote identification is active and up to date;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.9 before starting the UAS operation:		
		(a) verify that the remote identification system is operational;	*Please describe how this condition is met*	'I declare compliance.'

		(b) obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15 of the UAS Regulation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(c) ensure that the UAS is in a safe condition to complete the intended flight safely and, if applicable, check whether the direct remote identification is active and up to date;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(d) set the programmable flight volume of the UA to keep it within the flight geography; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(e) verify that the means to terminate the flight as well as the programmable flight volume functionality of the UA are operational; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.10 during the flight:		
		(a) unless supported by aerial observers (AOs), maintain thorough visual scan of the airspace that surrounds the UA to avoid any risk of collision with manned aircraft; the remote pilot should discontinue the flight if the operation poses a risk to other aircraft, people, animals, environment or property;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions

Topic	Method of proof	Condition	Integrity[69]	Proof[70]
		(b) maintain control of the UA, except in case of a loss of the command-and-control link;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(c) operate only one UA at a time;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(d) not operate the UA from a moving vehicle;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(e) not hand the control of the UA over to another control unit;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(f) inform the AO(s), when employed, in a timely manner of any deviations of the UA from the intended flight path, and of the associated timing;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(g) use the contingency procedures that are defined by the UAS operator for abnormal situations, including situations where the remote pilot has an indication that the UA may exceed the limits of the flight geography;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(h) use the emergency procedures that are defined by the UAS operator for emergencies, including triggering the means to terminate the flight when the remote pilot has an indication that the UA may exceed the limits of the operational volume;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		(i) activate the system to prevent the UA from exceeding the limits of the flight geography; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		(j) activate the direct remote identification system[22].	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Airspace observer (AO)	Self-declaration	5.4 The AO's main responsibilities are laid down in point UAS.STS-02.050 of the Annex to the UAS Regulation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.5 If operations are conducted at a height between 120 and 150 m, the AO(s) should undergo additional theoretical knowledge training in the following topics:		
		(a) raising awareness about the air risk and about the existence of other airspace users;	*Please include a reference to the relevant chapter/section of the OM, or otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		(b) checking height determination/ limitation devices;	*Please include a reference to the relevant chapter/section of the OM, or otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		(c) using the procedures for the coordination between the remote pilot and the AO(s); and	*Please include a reference to the relevant chapter/section of the OM, or otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		(d) using the applicable procedures in case a manned aircraft is detected.	*Please include a reference to the relevant chapter/section of the OM, or otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
6. Technical conditions				

UAS		6.1 The UAS operator should use a UAS marked with a class C6 identification label and which complies with the requirements of that class, as defined in Part 17 of the Annex to Regulation (EU) 2019/945.		'I declare that the UAS is marked with a class C6 identification label.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
	Self-declaration[23]	6.2 As an alternative to point 6.1, the UAS operator may use a UAS that complies with the requirements of Part 16 of the Annex to Regulation (EU) 2019/945, except that the UAS does not need to:	*Please describe how this condition is met.*	'I declare compliance.' or 'n/a'
		6.2.1 bear a class C3 or a class C6 UAS identification label;		
		6.2.2 be exclusively powered by electricity, if the UAS operator ensures that the environmental impact that is caused by the use of non-electric UAS is minimised;		
		6.2.3 include a notice that is published by EASA and provides the applicable limitations and obligations, as required by the UAS Regulation; and		

[23] The containment requirements (reference to points 4 and 5 of Part 17 of Regulation (EU) 2019/945) should be demonstrated with a 'medium' assurance level.

		6.2.4 include the manufacturer's instructions for the UAS if it is privately built; however, information on its operation and maintenance, as well as on the training of the remote pilot, should be included in the OM. ***Note 1**: The UAS can comply with point (9) of Part 4 of the Annex to Regulation (EU) 2019/945 by using an add-on that complies with Part 6 of the Annex to that Regulation.* ***Note 2**: If the UA does not bear a physical serial number that is compliant with standard ANSI/CTA-2063-A*		

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		'Small Unmanned Aerial Systems Serial Numbers' and/or does not have an integrated system of direct remote identification, it can comply with point (9) of Part 4 of the Annex to Regulation by using an add-on that complies with Part 6 of the Annex to that Regulation. ***Note 3**: If the UAS is privately built, there may be no identification on the UA of its MTOM. In that case, the operator should ensure that the MTOM of the UA, in the configuration of the UA before take-off, does not exceed 25 kg.*		
PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[69]**	**Proof[70]**
		'Small Unmanned Aerial Systems Serial Numbers' and/or does not have an integrated system of direct remote identification, it can comply with point (9) of Part 4 of the Annex to Regulation by using an add-on that complies with Part 6 of the Annex to that Regulation. ***Note 3**: If the UAS is privately built, there may be no identification on the UA of its MTOM. In that case, the operator should ensure that the MTOM of the UA, in the configuration of the UA before take-off, does not exceed 25 kg.*		

AMC6 Article 11 Rules for conducting an operational risk assessment

PREDEFINED RISK ASSESSMENT PDRA-G03 Version 1.1 EDITION September 2023

(a) Scope

This PDRA is the result of applying the methodology described in AMC1 Article 11 of the UAS Regulation to UAS operations performed in the 'specific' category:

(1) with UA with maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in case of a multirotor) of up to 3 m and typical kinetic energies of up to 34 kJ;

(2) BVLOS of the remote pilot;

(3) over sparsely populated areas;

(4) within the range of the direct C2 link in an operational volume under 30 m above the overflown area (or any other altitude reference defined by the Member State of operations);

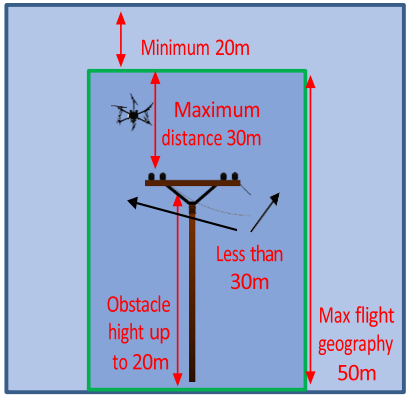
(5) following preprogrammed or preplanned flexible routes within the operational volume;

(6) in one of the following conditions:

(i) reserved or segregated airspace for UAS operations;

(ii) operating at a maximum height not exceeding 30 m from the ground;

(iii) when operating at no more than 30 m horizontally from an obstacle, operating at a maximum height not exceeding 15 m from the obstacle; if the height of the obstacle does not exceed 20 m, then the hight of the operation may be up to 30 m from the obstacle (meaning no more than a total of 50 m from the ground);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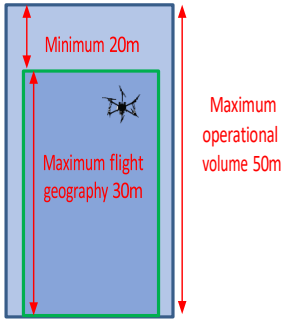
Maximum
distance 30m
Less than
30m
Obstacle
hight up
to 20m
Max flight
geography
50m


Minimum 20m
Maximum flight
geography 30m
Maximum
operational
volume 50m

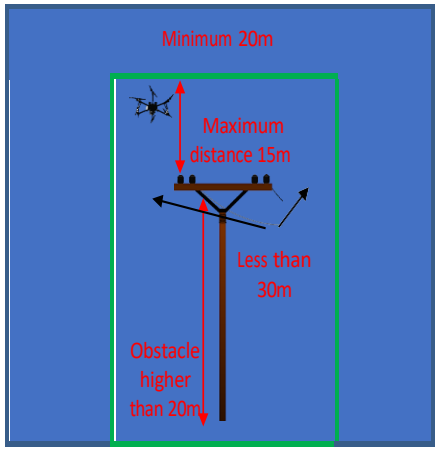


Figure 1 — Flight geography and operational volume when the operation is not conducted in reserved or segregated area

(7) operated routinely for regular inspections of facilities and infrastructure, e.g. industrial plants and similar, and operating in the atypical airspace within the shielding of such artificial obstacles as well as the natural obstacles, if any. The area of operation should be clearly identified within the application and the Authority should issue a ‘precise’ operation authorisation according to GM1 UAS.SPEC.040(1).

Note 1: This PDRA has been tailored for routine automated surveillance operation and inspection of facilities and infrastructures. It may be used as a basis for other purposes and, thus, may require an additional risk assessment.

Note 2: Many UAS operations under this PDRA may be conducted with a high level of automation, which should be considered by the competent authorities in terms of the required level of practical-skills training and assessment, as it should be proportionate to the lower level of intervention required by the remote pilot.

(b) PDRA characterisation and conditions

The characterisation and conditions for this PDRA are summarised in Table PDRA-G03.1 below:

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[24]**	**Proof[25]**
1. Operational characterisation (scope and limitations)				
Level of human intervention	Self-declaration	1.1 No autonomous operations: the remote pilot should have the ability to maintain control of the UA, except in case of a loss of the command-and-control (C2) link.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.2 The remote pilot should always be able to terminate the flight.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

[24] To be filled in by the UAS operator.

[25] To be filled in by the UAS operator.

		1.3 Either the flight path should be preprogrammed or flexible routes should be preplanned to ensure the UA avoids obstacles in the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.4 The remote pilot should not hand the control of the UA over to another command unit.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.5 The remote pilot should not operate the UA from a moving vehicle.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		1.6 The remote pilot should not hand the control of the UA over to another command unit.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
UA range limit	Self-declaration	1.7 Launch/recovery: at VLOS distance from the remote pilot, if not operating from a safe prepared area. *Note: 'Safe prepared area' means a controlled ground area that is suitable for the safe launch/recovery of the UA.*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.8 In flight: The range limit should be within the C2 link direct coverage which ensures the safe conduct of the flight.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Overflown areas	Declaration supported by data	1.9 UAS operations should be conducted:		
		1.9.1 over sparsely populated areas, and	*Please include a reference to the relevant chapter/section of the OM where the procedures for determining the population density are provided.*	'I declare compliance.' *Please describe how the population density data is identified.*

		1.9.2 over or up to 15 m horizontal distance from a facility or infrastructure at the request of the person or entity that is responsible for that facility or infrastructure.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
UA limitations	Self-declaration	1.10 Maximum characteristic dimensions (e.g. wingspan, rotor diameter/area or maximum distance between rotors in the case of a multirotor): up to 3 m	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.11 Typical kinetic energy: up to 34 kJ	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Flight height limit	Self-declaration	1.12 The maximum height of the operational volume should not be greater than the size of the reserved or segregated airspace, if applicable, or the height defined according to para 3.9. *Note: See point 3.10 defining the air risk buffer to be considered*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
Airspace	Self-declaration	1.13 The UA should be operated: *(refer also to point 3.9)*		
		1.13.1 in 'atypical airspace' that is included in uncontrolled airspace;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		1.13.2 in controlled airspace which the Authority has defined it meets 'atypical airspace' requirements and with the relevant coordination as defined by Authority; or	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Visibility	Self-declaration	1.14 If take-off and landing are conducted in VLOS of the remote pilot, the visibility should be sufficient to ensure that no people are in danger during the take-off /landing phase. The remote pilot should abort the take-off or landing in case people on the ground are in danger.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'	
Others	Self-declaration	1.15 The UA should not be used to drop material or to carry dangerous goods, except for dropping items in connection with agricultural, horticultural or forestry activities where the carriage of such items does not contravene any applicable regulations.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'	
2. Operational risk classification (according to the classification defined in AMC1 to Article 11 of the UAS Regulation)					
Final GRC	**3**	**Final ARC**	**ARC-a**	**SAIL**	**II**
3. Operational mitigations					
Operational volume (see Figure 2 of AMC1 Article 11)	Self-declaration	3.1 To determine the operational volume, the UAS operator should consider the position-keeping capabilities of the UAS in 4D space (latitude, longitude, height, and time).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'	
		3.2 In particular, the accuracy of the navigation solution, the flight technical error of the UAS and the path definition error (e.g. map error) and latencies should be considered and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'	

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**

		addressed when determining the operational volume.		
		3.3 The remote pilot should apply the emergency procedures as soon as there is an indication that the UA may exceed the limits of the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Ground risk	Self-declaration	3.4 The UAS operator should establish a ground risk buffer to protect third parties on the ground outside the operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4.1 The default criterion should be the use of the '1:1 rule' (e.g. if the UA is planned to operate at a height of 25 m, the ground risk buffer should at least be 25 m).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.4.2 A smaller ground risk buffer value may be applied by the applicant for a rotary wing UA using a ballistic methodology approach acceptable to the Authority. The 1:1 rule may in certain cases not be sufficient to meet the target level of safety. In such a case, the Authority may ask for a refinement of the definition of the ground risk buffer, based on criteria defined in SORA Step #9 depending on the adjacent air and ground risks.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.5 The operational volume and the ground risk buffer should be all contained in a sparsely populated area.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		3.6 The UAS operator should evaluate the area of operations, typically by means of on-site inspection or appraisal, and should be able to justify the significantly lower density of people at risk than in sparsely populated areas within	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		the entire operational volume including the ground risk buffer.		
		3.7 The UAS operator should ensure that the person or entity responsible for the facility or infrastructure has taken the necessary measures to protect the uninvolved persons present within the limits of the facility or infrastructure during the UAS operation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.8 The UAS operator should include points 3.4 to 3.7 in the Operations Manual (OM) (see point 4.1.1) and declare compliance with those conditions.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Air risk	Self-declaration	3.9 The UAS operation should be conducted: 3.9.1 in 'atypical airspace' which, for the purpose of this PDRA, is one of the following: 3.9.1.1 in reserved or segregated airspace; the claim for ARC-a is met if a reserved or segregated airspace is established and approved for the purpose of conducting UAS operations under this PDRA, with the operational volume and air risk buffer, if applicable, being entirely contained in that reserved or segregated airspace; 3.9.1.2 at a height of the flight geography of less than 30 m; 3.9.1.3 when operating in the proximity of natural or artificial obstacles (e.g. trees, buildings, towers, cranes, fences, power lines, etc.) whose height is below 20 m, keeping the UA within the following distances:	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**

		(i) 30 m horizontal distance; (ii) 30 m vertical distance from the top of the overflown obstacle; 3.9.1.4 when operating in the proximity of natural or artificial obstacles (e.g. trees, buildings, towers, cranes, fences, power lines, etc.) whose height is above 20 m, keeping the UA within the following distances: (i) 30 m horizontal distance; (ii) 15 m vertical distance from the top of the overflown obstacle; 3.9.2 away from all of the following: (i) any known permanent or temporary take-off and landings areas for all types of manned aircraft; this also includes parking lots, parks and other areas where helicopters occasionally operate from, as well as sites where police and helicopter emergency medical services (HEMS), and search and rescue (SAR) helicopters occasionally operate from in cases of accidents or other emergencies; (ii) known military aircraft low-flying routes; (iii) any other known low-level manned aircraft operations in the intended area of operation (e.g. balloon operations authorised en route below 500 ft); (iv) harbour/coastal areas where SAR operations may transit or operate; (v) any known areas where other unmanned aircraft operate		

		(including areas for model aircraft clubs or associations).		

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		3.10 The UAS operator should establish an air risk buffer to protect third parties in the air, outside the operational volume, if: 3.10.1 airspace classified as ARC-d is adjacent to the operational volume; or 3.10.2 the Authority or the entity responsible for the airspace management considers it necessary to require that the protection of third parties in the air be ensured.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.11 The air risk buffer as per point 3.10 should be contained where the probability of encounter with manned aircraft and other airspace users is low, as defined by the Authority.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		3.12 Before the flight, the UAS operator should assess the proximity of the planned UAS operation to manned aircraft activity.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Observers		n/a		
4. UAS operator and UAS operations conditions				
UAS operator and UAS operations	Declaration supported by data	4.1 The UAS operator should:		
		4.1.1 develop an operations manual (OM) (for the template, refer to AMC1 UAS.SPEC.030(3)(e) and to the complementary information in GM1 UAS.SPEC.030(3)(e));	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'

		4.1.2 develop a procedure to ensure that the security requirements applicable to the area of operations are complied with during the intended operation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.3 develop measures to protect the UAS against unlawful interference and unauthorised access;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		4.1.4 develop procedures to ensure that all operations comply with Regulation (EU) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data. In particular, the UAS operator should carry out a data protection impact assessment, when this is required by the data protection national authority of the Member State with regard to the application of Article 35 of that Regulation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.5 develop guidelines for its remote pilots to plan UAS operations in a manner that minimises nuisance, including noise and other emissions-related nuisance, to people and animals;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

		4.1.6 develop an emergency response plan (ERP) in accordance with the conditions for a 'medium' level of robustness (please refer to AMC3 UAS.SPEC.030(3)(e);	*Please describe how this condition is met.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.7 validate the operational procedures in accordance with the provisions for a 'medium' level of robustness included in AMC2 UAS.SPEC.030(3)(e);	*Please describe how this condition is met.*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'
		4.1.8 ensure the adequacy of the contingency and emergency procedures and prove it through any of the following: (a) dedicated flight tests; (b) simulations, provided that the representativeness of the simulation means is proven for the intended purpose with positive results;	*Please describe how this condition is met*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		(c) any other means acceptable to the Authority;		
		4.1.9 have a policy that defines how the remote pilot and any other personnel in charge of duties essential to the UAS operation can declare themselves fit to operate before conducting any operation;	*Please describe how this condition is met*	'I declare compliance and that the description for meeting this condition is available to the Authority for review.'

		4.1.10 if the operation takes place in reserved or segregated airspace, as part of the procedures that are contained in the OM (point 4.1.1 above), include the description of the following:		
		(a) the method and means of communication with the authority or entity that is responsible for the management of the airspace during the entire period of the reserved or segregated airspace being active, as mandated by the authorisation; *Note: The communication method should be published in the notice to airmen (NOTAM), which activates the reserved airspace to also allow coordination with manned aircraft.*	*Please describe how this condition is met.*	'I declare compliance and that evidence is available to the Authority for review.'
		(b) the personnel in charge of duties essential to the UAS operation, who are responsible for establishing that communication;	*Please describe how this condition is met.*	'I declare compliance and that evidence is available to the Authority for review.''
		4.1.11 designate for each flight a remote pilot with adequate competency and other personnel in charge of duties essential to the UAS operation if needed;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**

		4.1.12 ensure that the UAS operation effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that supporting evidence is included in the OM.'
		4.1.13 keep for a minimum of 3 years and maintain up to date a record of the information on UAS operations, including any unusual technical or operational occurrences and other data as required by the declaration or by the operational authorisation;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance and that record-keeping data is available to the Authority.'
UAS maintenance	Self-declaration	4.2 The UAS operator should:		
		4.2.1 ensure that the UAS maintenance instructions that are defined by the UAS operator are included in the OM and cover at least the UAS manufacturer's instructions and requirements, when applicable; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.2 ensure that maintenance staff follow the UAS maintenance instructions when performing maintenance;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.3 keep for a minimum of 3 years and maintain up to date a record of the maintenance activities conducted on the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.4 establish and keep up to date a list of the maintenance staff employed by the operator to carry out maintenance activities;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		4.2.5 comply with point UAS.SPEC.100, if the UAS uses certified equipment.	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	'I declare compliance.' or 'n/a'

External services		4.3 The UAS operator should ensure that the level of performance for any externally provided service necessary for the safety of the flight is adequate for the intended operation. The UAS	*Please describe how this condition is met.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		operator should declare that this level of performance is adequately achieved.		
	Self-declaration	4.4 The UAS operator should define and allocate the roles and responsibilities between the UAS operator and the external service provider(s), if applicable.	*Please describe how this condition is met.*	'I declare compliance.'
5. Conditions for the personnel in charge of duties essential to the UAS operation				
General	Self-declaration	5.1 The UAS operator should ensure that all personnel in charge of duties essential to the UAS operation are provided with competencybased theoretical and practical training specific to their duties, which consists of theoretical elements defined in AMC1 UAS.SPEC.050(1)(d) and practical elements defined in AMC2 UAS.SPEC.050(1)(d).	*Please describe how this condition is met.*	'I declare compliance. Evidence of training is available for inspection at the request of the competent authority or its authorised representative. The training programme is documented in the OM.'

		5.2 The UAS operator should keep and maintain up to date a record of all the relevant qualifications and training courses completed by the remote pilot and the other personnel in charge of duties essential to the UAS operation and by the maintenance staff for at least 3 years after those persons have ceased to be employed by the organisation or have changed position within the organisation.	*Please describe how this condition is met.*	'I declare compliance. Record-keeping data is available for inspection at the request of the Authority.'
Remote pilot		5.3 The remote pilot has the authority to cancel or delay any or all flight operations under the following conditions:		
		5.3.1 the safety of persons is jeopardised;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.2 property on the ground is jeopardised;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		5.3.3 other airspace users are in jeopardy;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.3.4 there is a violation of the terms of the operational authorisation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.4 The remote pilot should:		
	Self-declaration	5.4.1 not perform any 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;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		5.4.2 be familiar with the manufacturer's instructions provided by the manufacturer of the UAS;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.4.3 obtain updated information relevant to the intended operation about any geographical zones defined in accordance with Article 15 of the UAS Regulation; and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		5.4.4 ensure that the UAS is in a safe condition to complete the intended flight safely and, if applicable, check whether the direct remote identification is active and up to date.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Multi-crew cooperation (MCC)		5.5 Where multi-crew cooperation (MCC) is required, the UAS operator should:		
		5.5.1 designate the remote pilot-in-command to be responsible for each flight;	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
	Self-declaration	5.5.2 include procedures to ensure the coordination between the remote crew members with robust and effective communication channels; those	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		procedures should cover as a minimum the following:		

		5.5.2.1 the assignment of tasks to the remote crew members; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.5.2.2 the establishment of step-by-step communication; and	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
		5.6 ensure that the training of the remote crew covers MCC.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.' or 'n/a'
Maintenance staff	Self-declaration	5.7 Any staff member authorised by the UAS operator to perform maintenance activities should have been duly trained regarding the documented maintenance procedures.	*Please describe how this condition is met.*	'I declare compliance. Evidence of training is available at the request of the Authority or its authorised representative.'
Personnel in charge of duties essential to the UAS operation are fit to operate	Self-declaration	5.8 The personnel in charge of duties essential to the UAS operation should declare that they are fit to operate before conducting any operation based on the policy defined by the UAS operator.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
6. Technical conditions				
General		6.1 The UAS should be equipped with means to monitor the critical parameters for a safe flight, and in particular the following:		
		6.1.1 UA position, height or altitude, ground speed or airspeed, attitude, and trajectory;	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.1.2 UAS energy status (fuel, battery charge, etc.); and	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		6.1.3 the status of critical functions and systems; as a minimum, for services based on RF signals (e.g. C2 link, GNSS, etc.), means should be provided to monitor the adequate performance and trigger an alert when the performance level becomes too low.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.2 The UAS performance and in particular its capability to keep the position in 4D space (latitude, longitude, height, and time) should be such that allows the remote pilot to conduct safely operations close to natural or artificial obstacles. *Note: The UA should be able to fly safely at a distance closer than 30 m to artificial or natural obstacles.*	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.3 The UAS should provide means to programme the UA flight path prior to take-off, or if utilising flexible routes, be equipped with means to avoid obstacles while staying within the intended operational volume.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.3.1. If flexible routes are utilised, the UAS should provide means to prevent the UA from breaching the horizontal and vertical limits of a programmable operational volume.	*Please include a reference to the relevant chapter/section of the OM, otherwise indicate 'n/a'.*	'I declare compliance.'
	Self-declaration	6.4 The UAS should be protected against potential electromagnetic interferences from the infrastructure/facilities in the overflown area.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

Human–machine interface (HMI)		6.5 The UAS information and control interfaces should be clearly and succinctly presented and should not confuse, cause unreasonable fatigue, or contribute to causing any disturbance to the personnel in charge of duties essential to the UAS operation such that this	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		could adversely affect the safety of the operation.		
	Self-declaration	6.6 The UAS operator should conduct a UAS evaluation that considers and addresses human factors to determine whether the HMI is appropriate for the operation.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
C2 links and communication	Self-declaration	6.7 The UAS should comply with the appropriate requirements for radio equipment and the use of the RF spectrum.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.8 Protection mechanisms against interference should be used, especially if unlicensed bands (e.g. ISM) are used for the C2 link (mechanisms such as FHSS, DSSS or OFDM technologies, or frequency deconfliction by procedure).	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.9 The UAS should be equipped with a C2 link that is protected against unauthorised access to the C2 functions.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'

		6.10 In case of a loss of the C2 link, the UAS should have a reliable and predictable method for the UA to recover the C2 link or terminate the flight in a way that reduces the effect on third parties in the air or on the ground.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
		6.11 In the event of an emergency, the remote pilot should have effective means to communicate with the relevant bodies.	*Please include a reference to the relevant chapter/section of the OM.*	'I declare compliance.'
Tactical mitigation		n/a		
Containment	Declaration supported by data	6.12 To ensure a safe recovery from a technical issue that involves the UAS or an external system that supports the operation, the UAS should comply with the following basic containment provisions:		

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		6.12.1 no probable failure of the UAS or any external system that supports the operation should lead to operation outside the operational volume; and	*Please describe how this condition is met.*	ce enhanced containment

		6.12.2 it is reasonably expected that a fatality will not occur from any probable failure of the UAS, or any external system that supports the operation. *Note: The term 'probable' should be understood in its qualitative interpretation, i.e. 'anticipated to occur one or more times during the entire system/operational life of an item'.*	*Please describe how this condition is met.*	applies.' re compliance. or n and installation appraisal able, and covers at least the the design and installation followi features (independence, — separation, and redundancy); and the particular risks (e.g. hail, ice, snow, electromagnetic — interference, etc.) relevant to the type of operation.'
		6.13 The following enhanced containment conditions should apply if the adjacent area includes an assembly of people or if the adjacent airspace is classified as ARC-c or ARC-d (in accordance with SORA):		
		6.13.1 The UAS should be designed to standards that are considered adequate by the Authority and/or in accordance with a means of compliance that is acceptable to that authority such that:	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	'N/A since the basic containment applies' or 'I declare compliance with MoC Light-UAS.2511. Analysis and/or test data with supporting evidence are/is available.'
		6.13.1.1 the probability of the UA leaving the operational volume should be less than 10–4 /FH; and	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**

		6.13.1.2 no single failure of the UAS or of any external system supporting the operation should lead to operation outside the ground risk buffer. *Note: The term 'failure' should be understood as an occurrence which affects the operation of a component, part, or element such that it can no longer function as intended. Errors may cause failures but are not considered to be failures. Some structural or mechanical failures may be excluded from the criterion if it can be shown that these mechanical parts were designed according to aviation industry best practices.*	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	or 'The UAS has a DVR demonstrating compliance with Light-UAS.2511.
		6.13.2 SW and AEH whose development error(s) could directly lead to operations outside the ground risk buffer should be developed according to an industry standard or methodology that is recognised as adequate by EASA. *Note 1: The proposed additional safety conditions cover both the integrity and the assurance levels. Note 2: The proposed additional safety conditions do not imply a systematic need to develop the SW and AEH according to an industry standard or methodology recognised as adequate by the Authority. For instance, if the UA design includes an <u>independent</u> engine shutdown function that systematically prevents the UA from exiting the ground risk buffer due to single failures or an SW/AEH error of the flight controls from occurring, the intent of the conditions of point 6.13.1 above could be considered met.*	*Please include a reference to the relevant chapter/section of the OM or indicate 'n/a'.*	

		Note 3: For this PDRA, having adjacent airspace classified as ARC-c like a hospital heliport in uncontrolled airspace is also deemed subject to the		

PDRA characterisation and conditions				
Topic	**Method of proof**	**Condition**	**Integrity[1]**	**Proof[2]**
		above additional conditions (in addition to ARC-d, as per SORA Step #9 (c)).		

Remote identification[1]	Self-declaration	6.14 The UAS bears a unique serial number compliant with standard ANSI/CTA2063-A-2019, *Small Unmanned Aerial Systems Serial Numbers*, 2019, according to Article 40(4) of Regulation (EU) 2019/945.	*Please describe how this condition is met.*	'I declare compliance.'
		6.15 The UAS is equipped with a remote identification system according to Article 40(5) of Regulation (EU) 2019/945.	*Please describe how this condition is met.*	'I declare compliance.'
Lights[2]	Self-declaration	6.16 If the UAS is operated at night, it is equipped with at least one green flashing light according to point UAS.SPEC.050(1)(l)(i) of the UAS Regulation.	*Please describe how this condition is met or indicate 'n/a'.*	'I declare compliance.' or 'n/a'

AMC7 Article 11 Rules for conducting an operational risk assessment

ED Decision 2023/012/R

OPERATIONS OF UNMANNED FREE BALLOONS

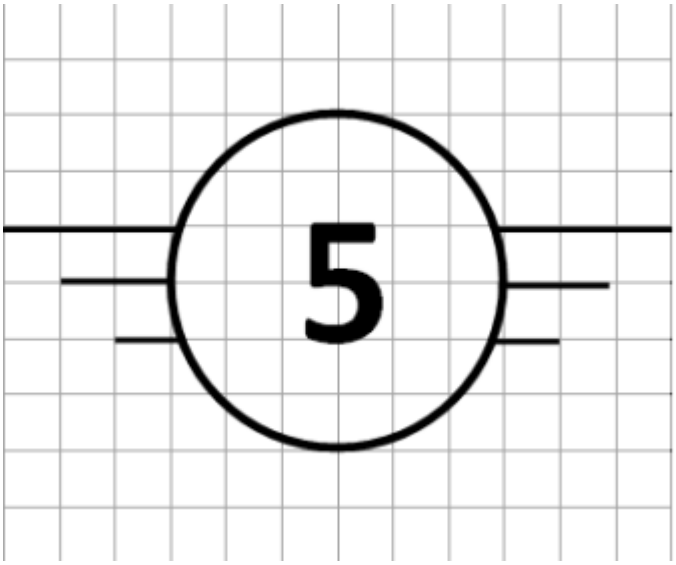
An operation using an unmanned free balloon that complies with the provisions defined in Appendix 2 to Regulation (EU) No 923/2012 is considered meeting the safety objectives of the operational risk assessment laid down in Article 11 and thus implies compliance with this Article.

SUBPART E

REQUIREMENTS FOR A CLASS C5 UNMANNED AIRCRAFT SYSTEM AND C5 ACCESSORIES

For the purpose of regulation 06 and third schedule of the Civil Aviation (Unmanned aircraft System) Regulations, this Subpart E Introduces, two new categories of UAS Class as detailed below. This Subpart Should be read in together with the third schedule of the above mentioned regulation.

A class C5 UAS bears the following class identification label on the UA:



A class C5 UAS shall comply with the requirements defined in Third Schedule, Part IV, of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, except those defined in paragraphs 2(d) and 2(n) of the Third Schedule Part IV.

In addition, it shall comply with the following requirements:

(1) be an aircraft other than a fixed-wing aircraft unless tethered;

(2) if it is equipped with a geo-awareness function, comply with paragraph 2(i) of the Third Schedule Part IV of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

(3) during flight, provide the remote pilot with clear and concise information on the height of the UA above the surface or take-off point;

(4) unless tethered, be equipped with a low-speed mode selectable by the remote pilot and limiting the ground speed to not more than 5 m/s;

(5) unless tethered, provide means for the remote pilot to terminate the flight of the UA, which shall:

(a) be reliable, predictable and independent from the automatic flight control and guidance system; this applies also to the activation of this means;

(b) force the descent of the UA and prevent its powered horizontal displacement; and

(c) include means to reduce the effect of the UA impact dynamics;

(6) unless tethered, provide the remote pilot with means to continuously monitor the quality of the command and control link and receive an alert when it is likely that the link is going to be lost or degraded to the extent of compromising the safe conduct of the operation, and another alert when the link is lost; and

(7) in addition to the information indicated in paragraph 2(n) of the Third Schedule Part IV, of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, include in the manufacturer's instructions a description of the means to terminate the flight required in paragraph 2(e).

(8) A class C5 UAS may consist in a class C3 UAS fitted with an accessories kit that ensures the conversion of the UAS C3 into a class C5 UAS. In this case, the class C5 label shall be affixed on all the accessories.

An accessories kit may only ensure conversion of a class C3 UAS that complies with point (1) and provides the necessary interfaces to the accessories.

The accessories kit shall not include changes to the software of the class C3 UAS.

The accessories kit shall be designed, and each accessory shall be identified, to ensure a complete and correct installation by a UAS operator on a class C3 UAS following the instructions provided by the manufacturer of the accessories kit.

The accessories kit may be placed on the market independently from the class C3 UAS for which they ensure the conversion. In this case, the manufacturer of the accessories kit shall place on the market a single conversion kit that shall:

(1) not alter the compliance of the class C3 UAS with the requirements of the Third Schedule Part IV of the Civil Aviation (Unmanned Aircraft System) Regulations 2024;

(2) ensure compliance of the UAS fitted with the accessories kit with all additional requirements defined in this Subpart Part with the exception of point (3) above; and

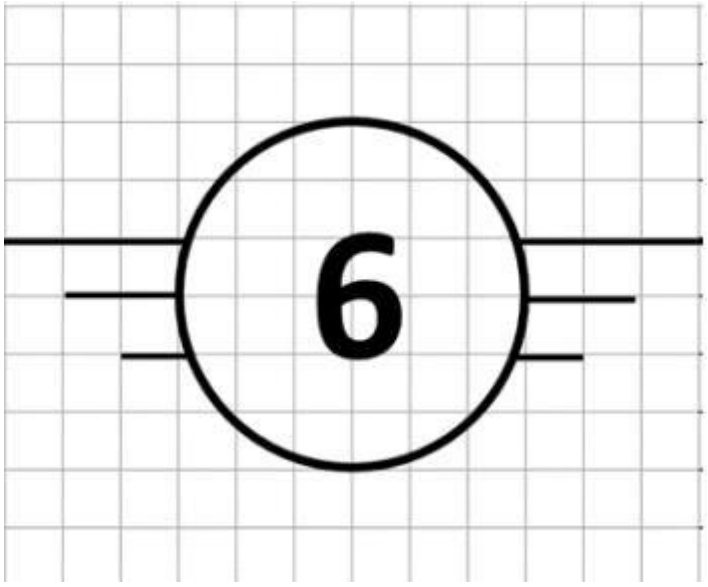
(3) be accompanied by manufacturer's instructions providing:

(i) the list of all class C3 UAS to which the kit can be applied; and

(ii) instructions on how to install and operate the accessories kit.]

Requirements for a class C6 unmanned aircraft system

A class C6 UAS bears the following class identification label on the UA:



A class C6 UAS shall comply with the requirements defined in the Third Schedule Part IV of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, except those defined in paragraphs 2 (b), 2 (e) and 2 (i).

In addition, it shall comply with the following requirements:

(1) have a maximum ground speed in level flight of not more than 50 m/s;

(2) if it is equipped with a geo-awareness function, comply with point 2(i) of the Third Schedule Part IV of the Civil Aviation (Unmanned Aircraft System) Regulations 2024;

(3) during flight, provide the remote pilot with clear and concise information on the geographical position of the UA, its speed and its height above the surface or take-off point;

(4) provide means to prevent the UA from breaching the horizontal and vertical limits of a programmable operational volume;

(5) provide means for the remote pilot to terminate the flight of the UA, which shall:

(a) be reliable, predictable, independent from the automatic flight control and guidance system and independent from the means to prevent the UA from breaching the horizontal and vertical limits as required in point (4); this applies also to the activation of this means; and

(b) force the descent of the UA and prevent its powered horizontal displacement;

(6) provide means to programme the UA trajectory;

(7) provide the remote pilot with means to continuously monitor the quality of the command and control link and receive an alert when it is likely that the link is going to be lost or degraded to the extent of compromising the safe conduct of the operation, and another alert when the link is lost; and

(8) in addition to the information indicated in point (2)(n) of the third Schedule Part IV of the Civil Aviation (Unmanned Aircraft System) Regulations 2024, include in the manufacturer's instructions:

(a) a description of the means to terminate the flight required in point (5);

(b) a description of the means to prevent the UA from breaching the horizontal and vertical limits of the operational volume and the size of the contingency volume needed to accommodate position assessment error, reaction time and correction manoeuvre span; and

(c) the distance most likely to be travelled by the UA after activation of the means to terminate the flight defined in point (5), to be considered by the UAS operator when defining the ground risk buffer.]

SUBPART F – APPLICATION FORMS

APPLICATION FORM FOR THE REGISTRATION OF UNMANNED AIRCRAFT SYSTEM (UAS)

Department of Civil Aviation SSR International Airport Plaine Magnien	**APPLICATION FOR REGISTRATION OF UNMANNED AIRCRAFT SYSTEM (UAS) (Under Regulation 5 of Civil Aviation (Unmanned Aircraft System) Regulations)**	Issue: 1 Revision: 0 Date: 09 December 2024

1. REGISTRATION TYPE

Choose recreational / commercial or government organisation registration based on how you will be operating your UAS. (please tick below)

☐ Operating for Recreational

☐ Operating for Commercial, Government or Non-recreational

2. APPLICANT DETAILS

Title	Mr ☐ Mrs ☐ Miss ☐
Full Name	
Date of Birth	
Nationality	
Mauritian National Identification Number	
Passport Number	
Contact/Mobile Number	
Email Address	
Full Residential Address	
If registering for business purpose	
Company Name	
Business Address	
If not the UAS Operator	
If you are not the UAS Operator, please fill-in part 3, otherwise, proceed to part 4.	

3. UAS OPERATOR DETAILS	
Title	Mr ☐ Mrs ☐ Miss ☐
Full Name	
Date of Birth	
Nationality	
Mauritian National Identification Number	
Passport Number	
Contact/Mobile Number	
Email Address	
Full Residential Address	

4. UAS SPECIFICATIONS	
UAS Status	New ☐ Used ☐
UAS Manufacturer	
Date of Manufacture	
UAS Make	
UAS Model	
UAS Serial Number	
Country of Manufacture	
UAS Weight	
Type of UAS	Fixed Wing ☐ Multi-Rotor ☐ Hybrid ☐

	If other, please specify ……
Purpose of UAS	Aerial Media ☐ Aerial Spotting ☐ Aerial Agriculture ☐ Aerial Survey ☐ If other, please specify ……

5. IF PREVIOUSLY REGISTERED IN ANOTHER COUNTRY	
Country of Registration	
UAS Registration Number	
Note: If registered in another country, you are required to submit a proof of cancellation of registration from the issuing Authority.	

6. TYPE APPROVAL OF THE UAS ISSUED BY INFORMATION AND COMMUNICATION TECHNOLOGIES AUTHORITY (ICTA) OF MAURITIUS	
Type Approval Reference	
Note: Please check the list of type approved UAS on ICTA website. If the type of your UAS is not available, an application should be made to ICTA.	

7. ATTACHMENTS		
Submission of the following documents are mandatory		**Comments (optional)**
Copy of Passport and/or National Identity Card	☐ attached	
Photograph of your UAS (front view)	☐ attached	
Photograph of your UAS serial number	☐ attached	

8. DECLARATION

I hereby declare:

(a) that to the best of my knowledge the particulars entered on this registration form are accurate and correct in every respect.

(b) that I have read and understood the UAS requirements and regulations published by DCA.

(c) that I have provided all the mandatory documentations required to be submitted.

Full Name	
Signature	
Date	

9. FOR OFFICE USE ONLY

Remarks:

Comply with our requirements?

☐ Yes ☐ No

If yes, UAS Registration Identification: ……

Name: …… Position: …….. Date: ……

Signature: ……..

Verified by:

Name: …… **Position:** …… **Date:** ……

Signature: ……..

Recommended for approval by:

Name: …… Position: …… Date: ……

Signature: ……..

Approved by:

Name: …… Position: …… Date: ……

Signature: ……..

APPLICATION FOR REGISTRATION OF

UNMANNED AIRCRAFT SYSTEM (UAS) OPERATOR

Department of Civil Aviation SSR International Airport Plaine Magnien	**APPLICATION FOR REGISTRATION OF UNMANNED AIRCRAFT SYSTEM (UAS) OPERATOR** (Under Regulation 7 of Civil Aviation (Unmanned Aircraft System) Regulations)	Issue: 2 Revision: 0 Date: 30 June 2025

1. APPLICATION		
Initial Issue ☐	Renewal ☐	Amendment ☐

2. UAS OPERATOR DETAILS	
Title & Full Name[1]	
UAS Operator Identification Number	
Nationality	
Mauritian National Identification Number	
Phone Number	Home: …… Office: …… Mobile: ……
Email Address	
Full Residential Address	
If registered for commercial/business purpose	
Company Name	
Business Address	
Business Registration Number	
INSURANCE DETAILS (IF APPLICABLE)[2]	
Name of Insurer	
Insurance Policy No.	
Limit of Insurance Liability	
QUALIFICATION DETAILS (IF APPLICABLE)[3]	
Qualification of operator	
Validity of Operator qualification	

[1] **Full name should appear as per Mauritian National Identification Card or Passport.**

[2] **Insurance cover is not applicable for operators using their UAS solely for leisure/recreational purposes.**

[3] Qualification of the operator is not applicable for operators using their UAS solely for leisure/recreational purposes. For operations other than leisure/recreational purposes, the qualification(s) will be authenticated with the competent Authority.

3. UAS SPECIFICATIONS[4]	
UAS Make	
UAS Model	
UAS Serial Number	
Country of Manufacture	
UAS Weight	
Type of UAS	Fixed Wing ☐ Multi-Rotor ☐ Hybrid ☐ If other, please specify ……
Purpose of UAS	Aerial Media ☐ Aerial Spotting ☐ Aerial Agriculture ☐ Aerial Survey ☐ If other, please specify ……
UAS Registration Number	

4. ATTACHMENTS		
Submission of the following documents are mandatory		**Comments (optional)**
Copy of Passport and/or National Identity Card of UAS Operator	☐attached	
Proof of appropriate level of competency for UAS Pilots or other equivalent certificates	☐attached	
Insurance Policy covering associated liabilities with the UAS(s)	☐attached	

[4] If multiple UAS(s) are registered with DCA, continue "section 2 – UAS Specifications" in additional pages to ensure comprehensive coverage of all UAS(s) details [List UAS(s) as UAS#1, UAS#2, UAS#3,…etc. for easy demarcation].

5. DECLARATION

I hereby declare:

(a) that to the best of my knowledge the particulars entered on this registration renewal form are accurate and correct in every respect.
(b) that I have read and understood the UAS requirements and regulations published by DCA.
(c) that I have provided all the mandatory documentations required to be submitted.

Full Name	
Signature	
Date	

6. FOR OFFICE USE ONLY

Remarks:

Comply with our requirements?

☐ Yes ☐ No

If yes, UAS Operator Identification: ……

Name:…… **Position: ……..** **Date:……**

Signature: ……...

Verified by:

Name: …… **Position:** …… **Date:** ……

Signature: ……...

Recommended for approval by:

Name: …… Position: …… Date: ……

Signature: ……...

Approved by:

Name: …… Position: …… Date: ……

Signature: ……...

APPLICATION FOR OPERATIONS IN

OPEN CATEGORY

Department of Civil Aviation SSR International Airport Plaine Magnien	**APPLICATION FOR OPERATIONS IN OPEN CATEGORY (Under Regulation 10 of Civil Aviation (Unmanned Aircraft System) Regulations))**	Issue: 1 Revision: 0 Date: 09 December 2024

1. APPLICATION
Initial Issue ☐ Renewal ☐ Amendment ☐

2. APPLICANT DETAILS	
Title	Mr ☐ Mrs ☐ Miss ☐
Full Name	
Date of Birth	
Nationality	
Mauritian National Identification Number	
Passport Number	
Contact/Mobile Number	
Email Address	
Full Residential Address	
If registering for business purpose	
Company Name	
Business Address	
Business Registration Number	

Brief Description of your Company's Activities in general and in relation to the Operation of UAS	
UAS Operator Identification	
UAS Registration Number	
For foreigners already registered with Authority outside Mauritius	
Issuing Authority Name and Country	

3. TYPE OF OPEN SUB CATEGORY
A1 ☐ A2 ☐ A3 ☐

4. FLYING ACTIVITY DETAILS	
Intended Area(s) of operation	
Details of Activity	
Insurance Details	
Name of Insurer	
Insurance Policy No.	

Limit of Insurance Liability	
Qualification Details	
Qualification of operator[1]	

[1] **Qualification of the operator will be authenticated with the competent issuing authority**

5. ATTACHMENTS		
Submission of the following documents are mandatory		**Comments (optional)**
Insurance Cover for Third Party Liabilities (including coverage in Mauritius)	☐ attached	
For sub category A1 and A3, proof of successful completion of theoretical training of UAS Pilot	☐ attached	
For sub category A2, UAS Pilot Certificate of Competency and proof of	☐ attached	
successful completion of practical training		
Type approval of the UAS issued by the Information and Communication Technologies Authority (ICTA) of Mauritius	☐ attached	

6. DECLARATION

I hereby declare:

(g) that to the best of my knowledge the particulars entered on this application form are accurate and correct in every respect.
(h) that I have read and understood the UAS requirements and regulations published by DCA.
(i) that I have provided all the mandatory documentations required to be submitted.

Full Name	
Signature	
Date	

7. FOR OFFICE USE ONLY

Remarks:

Comply with our requirements?

☐ Yes ☐ No

Name:……. Position: …….. Date:……

Signature: ……..

Verified by:

Name: …… **Position:** …… **Date:** ……

Signature: ……..

Recommended for approval by:

Name: …… Position: …… Date: ……

Signature: ……..

Approved by:

Name: …… Position: …… Date: ……

Signature: ……..

APPLICATION FOR OPERATIONS IN SPECIFIC CATEGORY

Department of Civil Aviation SSR International Airport Plaine Magnien	**APPLICATION FOR OPERATIONS IN SPECIFIC CATEGORY (Under Regulation 11 of Civil Aviation (Unmanned Aircraft System) Regulations)**	Issue: 1 Revision: 0 Date: 09 December 2024

1. APPLICATION

New application ☐ Renewal ☐ Amendment ☐

2. UAS OPERATOR DATA

UAS Operator Name: ……..	**Company Name:** ……..

Postal Address: ……

Email Address: ……

Telephone: ……

UAS Operator Identification:

……

Name of Accountable Manager: ……	
Mauritian National Identification Number: ……	Passport Number: ……..
Telephone: ……	Email Address: ……..

3. DETAILS OF UAS OPERATION

Expected Start Date of Operation: ……

Intended area(s) of Operation: ……

Upper Limit of the Operational Volume (AGL for operations under 400 ft and MSL for operations over 400 ft):

……

Insurance Details:

Name of Insurer: ……..

Insurance Policy No: …….

Limit of Insurance Liability: ……

Type of Operation: ☐ VLOS ☐ BVLOS	Risk Assessment Reference and Revision: ☐ SORA Version: ……. ☐ PDRA #: …….... ☐ Other: …….…….…….……	
Transport of Dangerous Goods	☐ Yes ☐ No	
Ground Risk Characterisation	Operational area	☐ Controlled Ground Area ☐ Sparsely Populated Area ☐ Populated Area ☐ Assembly of People
	Adjacent area	☐ Controlled Ground Area ☐ Sparsely Populated Area ☐ Populated Area ☐ Assembly of People
Airspace Volume of the Intended Operation		☐ A ☐ C ☐ D ☐ G ☐ U-space ☐ Other: …
Residual Air Risk	Operational area	☐ ARC-a ☐ ARC-b ☐ ARC-c ☐ ARC-d
	Adjacent area	☐ ARC-a ☐ ARC-b ☐ ARC-c ☐ ARC-d

4. UAS DETAILS[1]	
Manufacturer: ……..	Model: ……..
Make: ……..	Max Characteristic Dimensions: … ..... m
Serial Number: ……...	
Type of UAS ☐ Fixed-wing ☐ Multi-Rotor ☐ Hybrid If other, please specify …….	
MTOM: … .....kg	Maximum Speed: ……m/s (… .....kt)

Characteristic Dimension / Typical Kinetic Energy

(*For aeroplanes: usually the length of the wing span; for helicopters: usually the distance between leading rotor tip and tail; for multirotors: the maximum distance between the tips of two propellers diagonally*) ☐ 1 m / 700 J ☐ 3 m / 34 J ☐ 8 m / 1084 J ☐ > 8 m / > 1084 J	
Mitigation of Effects of Ground Impact	☐ No ☐ Yes, Low Robustness ☐ Yes, Medium Robustness ☐ Yes, High Robustness
Technical Requirement for Containment	☐ Basic ☐ Enhanced
Type Certificate or Design Verification Report (if applicable): ……....	
Number of Certificate of Airworthiness (if applicable): ……....	
Number of the Noise Certificate (if applicable): ……....	

[1] **Section 4 shall be filled for each UAS. Please print additional pages if required.**

5. ATTACHMENTS		
Submission of the following documents are mandatory		**Comments (optional)**
Operations Manual	☐ attached	
Compliance Matrix PDRA	☐ attached	
SORA – ConOps	☐ attached	
SORA – GRC, ARC, SAIL Calculations, OSOs and Safety Portfolio	☐ attached	
Proof of insurance	☐ attached	

6. DECLARATION

I, the undersigned, hereby declare that the above stated information is correct. I declare that the UAS operations comply with the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and the Mauritius Civil Aviation Requirements (MCAR) - UAS.

Full Name of Accountable Manager	
Signature	
Date	

7. FOR OFFICE USE ONLY

Remarks:

Comply with our requirements?

☐ Yes ☐ No

Name:…… Position: …….. Date:……

Signature: ……...

Verified by:

Name: …… **Position:** …… **Date:** ……

Signature: ……...

Recommended for approval by:

Name: …… Position: …… Date: ……

Signature: ……...

Approved by:

Name: …… Position: …… Date: ……

Signature: ……...

APPLICATION FOR LIGHT OPERATOR CERTIFICATE (LUC)

1. APPLICATION TYPE
New application ☐ Renewal ☐ Amendment ☐ If renewal or amendment, please provide LUC Approval Reference Number: ……

2. UAS OPERATOR DATA	
UAS Operator Name: ……	
Postal Address: ……	
Email Address: ……	
Telephone: ……	
UAS Operator Identification: ……	
Company Name ……	
Business Address ……	
Brief Description of your Company's Activities in general and in relation to the Operation of UAS …… …… …… ……	
Size of Company (number of employees)	1 ☐ 2-5 ☐ 6-15 ☐ +15 ☐
Insurance Details	

	Name of Insurer: …… Insurance Policy No: …… Limit of Insurance Liability: …….

Accountable Manager: ……	
National Identification Number: ……..	Passport Number: ……..
Telephone: ……..	Email Address: ……...

Other management, e.g. operations manager, technical manager, quality manager	Position: ……
National Identification Number: ……..	Passport Number: ……..
Telephone: ……..	Email Address: ……...

Other management, e.g. operations manager, technical manager, quality manager	Position: ……
National Identification Number: ……..	Passport Number: ……..
Telephone: ……..	Email Address: ……...

Other management, e.g. operations manager, technical manager, quality manager	Position: ……
National Identification Number: ……..	Passport Number: ……..
Telephone: ……..	Email Address: ……...

3. UAS DETAILS[1]

Manufacturer: ……..	Model: ……..
Make: ……..	Max Characteristic Dimensions: ….....m
Serial Number: ……...	
Type of UAS ☐ Fixed-wing ☐ Multi-Rotor ☐ Hybrid If other, please specify …….	
MTOM: ….....kg	Maximum Speed: …….m/s (….....kt)
Characteristic Dimension / Typical Kinetic Energy (*For aeroplanes: usually the length of the wing span; for helicopters: usually the distance between leading rotor tip and tail; for multirotors: the maximum distance between the tips of two propellers diagonally*) ☐ 1 m / 700 J ☐ 3 m / 34 J ☐ 8 m / 1084 J ☐ > 8 m / > 1084 J	
Mitigation of Effects of Ground Impact	☐ No ☐ Yes, Low Robustness ☐ Yes, Medium Robustness ☐ Yes, High Robustness
Technical Requirement for Containment	☐ Basic ☐ Enhanced
Type Certificate or Design Verification Report (if applicable): ……...	
Number of Certificate of Airworthiness (if applicable): ……...	
Number of the Noise Certificate (if applicable): ……...	

[1] **Section 3 shall be filled for each UAS. Please print additional pages if required.**

<table>
<tr><th colspan="3">4. DETAILS OF UAS OPERATION</th></tr>
<tr><td colspan="3">Expected Start Date of Operation:

……..</td></tr>
<tr><td colspan="3">Intended area(s) of Operation: ……..……</td></tr>
<tr><td colspan="3">Upper Limit of the Operational Volume (AGL for operations under 400 ft and MSL for operations over 400 ft):

…….</td></tr>
<tr><td colspan="3">Level of assurance and Integrity:

……</td></tr>
<tr><td>Type of Operation:

☐ VLOS ☐ BVLOS</td><td colspan="2">Risk Assessment Reference and Revision:

☐ SORA Version: ……. ☐ PDRA #: ……..…..
☐ Other: ……..……..……..…….</td></tr>
<tr><td>Transport of Dangerous Goods</td><td colspan="2">☐ Yes ☐ No</td></tr>
<tr><td rowspan="2">Ground Risk Characterisation</td><td>Operational area</td><td>☐ Controlled Ground Area
☐ Sparsely Populated Area
☐ Populated Area
☐ Assembly of People</td></tr>
<tr><td>Adjacent area</td><td>☐ Controlled Ground Area
☐ Sparsely Populated Area
☐ Populated Area
☐ Assembly of People</td></tr>
<tr><td colspan="2">Airspace Volume of the Intended Operation</td><td>☐ A ☐ C ☐ D ☐ G
☐ U-space ☐ Other: …</td></tr>
<tr><td rowspan="2">Residual Air Risk</td><td>Operational area</td><td>☐ ARC-a ☐ ARC-b
☐ ARC-c ☐ ARC-d</td></tr>
<tr><td>Adjacent area</td><td>☐ ARC-a ☐ ARC-b
☐ ARC-c ☐ ARC-d</td></tr>
<tr><td>Brief Description of the Intended Operation(s):</td><td colspan="2"></td></tr>
<tr><th colspan="3">5. ATTACHMENTS</th></tr>
</table>

Submission of the following documents are mandatory		**Comments (optional)**
Operations Manual	☐ attached	
Safety Management Manual	☐ attached	
Compliance Matrix PDRA	☐ attached	
SORA – ConOps	☐ attached	
SORA – GRC, ARC, SAIL Calculations, OSOs and Safety Portfolio	☐ attached	
Proof of insurance	☐ attached	

6. DECLARATION	
I, the undersigned, hereby declare that the above stated information is correct. I declare that the UAS operations comply with the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and the Mauritius Civil Aviation Requirements (MCAR) - UAS.	
Full Name of Accountable Manager	
Signature	
Date	

7. FOR OFFICE USE ONLY
Remarks: **Comply with our requirements?** ☐ Yes ☐ No **Name:…… Position: …….. Date:……** **Signature: ……...**
Verified by:
Name: …… **Position:** …… **Date:** …… **Signature:** ……...
Recommended for approval by:
Name: …… Position: …… Date: …… **Signature: ……...**
Approved by:
Name: …… Position: …… Date: …… **Signature: ……...**

SUBPART G

AGRICULTURAL UAS (DRONE) OPERATIONS

1. INTRODUCTION

The Regulations related to Unmanned Aircraft (UA / Drone) flying operations within Mauritius airspace are contained within the Civil Aviation (Unmanned Aircraft System) Regulations 2024 and the Mauritius Civil Aviation Requirements Unmanned Aircraft System (MCAR UAS).

Due to the high risk imposed by an Unmanned Aircraft (UA / Drone) having a Maximum Take-off Mass (MTOM) of 25 kg and above, this Subpart G to the MCAR UAS is being published under Regulation 11 (2) UAS Specific Category Operations, of the Civil Aviation (Unmanned Aircraft System) Regulations 2024.

As per the MCAR UAS published by the Department of Civil Aviation (DCA), drone operations in the open category are limited to drone having a MTOM of up to 25 kg. Therefore, an operational authorisation will be required to be issued by the DCA in the specific category as a minimum for agricultural purposes.

The purpose of this Subpart G to the MCAR UAS is to establish a regulatory framework relating to the operations of UAS (drones) exclusively for agricultural applications including surveying, scouting, mapping, seeding, spraying and spreading across sugarcane fields, vegetable plantations and forestry operations without compromising on other appropriate Authorities regulations relating to the spraying of biocides and/or chemical substances.

2. APPLICABILITY

This framework is applicable to:

1. Drone having a MTOM of 25 kg and up to 100 kg operated exclusively for agricultural applications and submission of:
   (i) Predefined Risk Assessment PDRA-G01/G02/G03 **or** PDRA-S01/S02 Operations Manual; and
   (ii) PDRA-G01 or G02 or G03 Operations Manual Compliance Checklist **or** PDRA-S01 or S02 Operations Manual Compliance Checklist **or** Specific Operations Risk Assessment (SORA) when published.
2. Drone having a MTOM of less than 25 kg which is used for agricultural spraying and spreading purposes.

3. PREREQUISITES

(i) Each drone's spraying system (i.e., per serial number) shall undergo technical testing by the Mauritius Cane Industry Authority representing the Ministry of Agro-Industry, Food Security, Blue Economy and Fisheries.

(ii) The UAS operator shall ensure that any person responsible for handling, mixing, loading, applying or supervising the application of plan protection products, holds the appropriate permit, certificate or authorisation issued by the Mauritius Cane Industry Authority representing the Ministry of Agro-Industry, Food Security, Blue Economy and Fisheries, or is directly supervised by a person holding such permit, certificate or authorisation.

3.1 Spraying of chemical substances and/or preparations

Any person releasing a substance or preparation into the environment must ensure that human health is not endangered and that the environment is not adversely affected. This obligation also applies to spraying operations conducted by drones. Appropriate measures must be taken to prevent any exposure of people and the environment to chemical products within the spraying area.

The operator shall comply with the product label, approved dosage, authorised crop, target use, personal protective equipment requirements and any restrictions imposed by the competent authority.

3.2 Spray plan

Prior to each spraying operation, the operator shall prepare a spray plan identifying the intended treatment area, crop or vegetation, product to be applied, intended dosage, planned application rate, proposed date and time, identified sensitive areas, buffer zones, personnel involved, and emergency arrangements.

3.3 Spraying of biocides

The use of biocides with drones requires coordination between the Department of Civil Aviation (for the aeronautical aspects) and the Mauritius Cane Industry Authority representing the Ministry of Agro-Industry, Food Security, Blue Economy and Fisheries for the biocides aspects.

4. CERTIFICATION REQUIREMENTS

This Department can only issue drone operational authorisation for agricultural spraying only after consultation, with the Mauritius Cane Industry Authority representing the Ministry of Agro-Industry, Food Security, Blue Economy and Fisheries, to ensure proper and responsible chemical spraying operations in the agricultural sector.

5. DURATION OF THE OPERATIONAL AUTHORISATION CERTIFICATE

3 years from the date of issuance.

6. DRONE REQUIREMENTS AND / OR OPERATIONAL CONDITIONS TO BE MET BY THE PROSPECTIVE AGRICULTURAL DRONE OPERATOR:

1. Drone having MTOM of up to 100 kg that are only operated over land owned or leased by the drone owner or with the permission from the land owner.
2. UA (Drone) having maximum characteristic dimension of up to 3 metres and typical kinetic energy of up to 34 kJ as per the MCAR UAS.
3. During application and spraying flights, the horizontal speed (top speed) of the UAS (drone) must not exceed 5 m/s.
4. Spraying is prohibited when the horizontal wind speed exceeds 5 m/s, in gusts of 5 m/s and more, or in strong thermal winds. To ensure a general drift-free application, it is recommended to stop the treatment as soon as the wind speed exceeds 11 km/h or 3 m/s (i.e. from Beaufort scale 3: leaves and branches move, small plumes flutter). It is also recommended to measure the wind speed on site, for example with an anemometer.
5. For application and spraying flights, the following reduced heights must be observed:

   (i) Maximum 6 metres above ground level (AGL) during actual application.

   (ii) Maximum 40 metres above ground level (AGL) during the transition phases.

   Exception: For application in fruit growing (tall stem), a maximum flight altitude of 3 metres above the crop in question applies.
6. In addition to the provisions of condition of the AMC1 UAS.SPEC.050(1)(g) of the MCAR UAS, the treated parcels and their areas, as well as the substances and quantities applied, shall be recorded and retained as evidence.
7. Technical problems related to the battery, spray nozzles, propellers and remote control must be rectified before each use. The tightness of the pipes and spray nozzles must be checked regularly.
8. Only approved plant protection products and fertilisers authorised for the intended use by the Mauritius Cane Industry Authority representing the Ministry of Agro-Industry, Food Security, Blue Economy and Fisheries may be applied. The application instructions in the authorisation of plant protection products must be observed. Refer to the concerned Authorities for the spraying and spreading of these products and fertilisers.

9. The flight path must be pre-programmed (except for one-off treatments with herbicides). The aircraft must follow the flight path without human intervention and automatically apply the products within the specified range. It must be possible to interrupt the application immediately at any time and take over manual control of the aircraft.

   Note: Human intervention (manual flying) is permitted during take-off and landing, as well as during selective touch-ups, e.g at the edges of plots at the end of treatment.

10. During application work, it must be ensured that no persons present on the ground come into contact with the product applied from the air. Persons must be adequately protected in accordance with the instructions for use if exposure to the product cannot be avoided.

11. Minimum distances from people and safety distance depending on the products being sprayed must be observed.

12. Bystanders or uninvolved persons are not allowed in the zone to be overflown.

13. A safety distance of at least 10 metres must be kept between the drone and bystanders or uninvolved persons in the surrounding area.

14. To mitigate the risk of pesticide drift, a minimal safety distance of 20 metres must be maintained from surface waters, biotopes, the property boundary of buildings, public places, residential areas and bystanders during agricultural operations when field crops, grassland and meadows, vegetables, strawberries or lawns are treated or when herbicide treatments are performed.

15. The staff of the company, and in particular the appropriate personnel of the company, must be appropriately trained;

    (i) When preparing the spray liquid and cleaning the containers, personnel must be equipped and dressed in accordance with the information in the safety data sheet of the products being used.

    (ii) Personnel handling plant protection products shall hold the appropriate permit, certificate or authorisation required by the competent Authority, or shall operate under the direct supervision of a person holding such permit, certificate or authorisation. For the purposes of this guideline, the Mauritius Cane Industry Authority representing the Ministry of Agro-Industry, Food Security, Blue Economy and Fisheries shall be the relevant authority.

16. Meteorological visibility shall be at least 1 km.

17. The conditions for the safe operation of the aircraft laid down by the manufacturer shall be fulfilled at all times.

18. No drone flight to be carried out within 5 km of the airport unless a special permission is applied including submission of a risk assessment and coordination with the Air Traffic Control.

19. Drone flight is prohibited 500 metres laterally from the runway centreline.

20. Necessary coordination has to be made between the UAS operator and the manned aircraft operator when drone spraying is intended to be carried out near a heliport, helipad and airstrip, as applicable.

21. Regardless of the above-mentioned prior coordination, the following rules must be strictly adhered to at all times;

    (i) The UAS must give priority to manned aircraft under all circumstances.

    (ii) If the remote pilot observes a manned aircraft on a convergent trajectory that may result in a risk of collision with the UA, the remote pilot must land it immediately.

7. QUALIFICATION OF THE REMOTE / UAS PILOT

The following qualifications in the specific category may be acceptable to the DCA depending on the type of the drone operations to be carried out by the drone operator:

1. If the course is delivered by a UK CAA Recognised Assessment Entity:

    (i) General Visual Line of Sight Certificate (GVC)

    (ii) Level 1 Remote Pilot Certificate (RPC-L1)

    - Part A – VLOS
    - Part B – BVLOS with Visual Mitigations (VM)

    (iii) Level 2 Remote Pilot Certificate (RPC-L2)

    (iv) Level 3 Remote Pilot Certificate (RPC-L3)

2. If the course is being delivered by a European Country or other acceptable country:

    The training should meet the theoretical knowledge subjects for the training of the remote pilot and practical-skills training for the remote pilot to the UAS operation in the ‘specific’ category as per the AMCs of the requirement UAS.SPEC.050 of the MCAR UAS.

Please note that the Department recognises licences or remote pilot competency certificate issued in the specific category as detailed in the MCAR UAS published by the DCA. In the event a remote pilot licence or remote pilot competency certificate is not issued in the specific category as detailed in the MCAR UAS, therefore, the training organisation or issuing Authority should issue a statement confirming the equivalency to the MCAR UAS specific category for our acceptance.

There are many training institutions offering drone pilot training in, South Africa, France etc which can be used to obtain a pilot certification acceptable to the DCA. Please confirm before you organise such a course that the training institution will be recognised by the DCA.

8. DOCUMENTS OR APPLICATION FORMS TO BE SUBMITTED TO OBTAIN AN OPERATIONAL AUTHORISATION

1. Registration of Unmanned Aircraft System application form
2. Registration of Unmanned Aircraft System (UAS) Operator application form
3. Operations in Specific Category application form
4. Filled in PDRA-G01 or PDRA-G02 or PDRA-G03 Operations Manual or PDRA-S01 or PDRA-S02 Operations Manual as template available on the DCA website and in compliance with the MCAR UAS depending on the type of operations to be carried out. The operations manual must be appropriately detailed to include the above-mentioned operational conditions requirements and detail the drone operator typical agricultural spraying or spreading operations.
5. Filled-in PDRA-G01 or PDRA-G02 or PDRA-G03 Operations Manual Compliance checklist or PDRA-S01 or S02 Operations Manual Compliance Checklist or Specific Operations Risk Assessment (SORA) when published.
6. Appropriate theoretical and practical remote pilot certificate or remote pilot licence depending on the type of operations to be carried out.
7. Insurance certificate covering third party liabilities. An adequate level of insurance will need to be obtained by an operator before a Permission is granted.

   Applicants should discuss these requirements directly with insurance providers, to ensure that adequate third-party liability is provided to cover the intended scope of their operation.
8. ICTA Approval of the type of drone (s) to be used.

9. DCA Website Useful links:

1. The above documents, UAS Regulations, MCAR UAS and application forms are available on the DCA website at: https://civil-aviation.govmu.org/Pages/DRONE/Drone-Requirement.aspx

2. AIP ENR 5.1 PROHIBITED, RESTRICTED AND DANGER AREAS to be consulted at: https://civil-aviation.govmu.org/Documents/Aeronautical%20Information%20Publication/PART%202/ENR%205.1-1.pdf

3. AD 2 AERODROMES, FIMP AD 2.24 CHARTS RELATED TO AN AERODROME, Visual Approach Chart to aerodrome and control zone (CTR Class C) map: https://civil-aviation.govmu.org/eAIP/eAIPMauritius/index.html or direct link https://civil-aviation.govmu.org/eAIP/eAIPMauritius/final/2025-05-15-Non-AIRAC/html/Document/Visual%20Approach%20Chart.pdf