

Acceptable Means of Compliance and Guidance Material to Annex IX (Part-IAM) to Regulation (EU) No 965/2012

Issue 1

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GM1 IAM.GEN.050 Scope

IAM OPERATIONS WITH VCA FALLING WITHIN THE SCOPE

The following fall within the scope of IAM operations:

- (a) commercial air transport operations with manned VCA;
- (b) non-commercial operations with manned VCA, including training flights, maintenance check flights, demonstration flights and ferry flights;
- (c) emergency medical services (EMS) with manned VCA (VEMS).

AMC1 IAM.GEN.VCA.100 Pilot responsibilities

COPIES OF REPORTS

Where a written report is required, a copy of the report should be communicated to the PIC concerned unless the terms of the operator’s reporting scheme dictate otherwise.

GM1 IAM.GEN.VCA.100 Pilot responsibilities

OCCURRENCE-REPORTING SCHEME

Regulation (EU) No 376/2014² contains the relevant requirements for the operator’s occurrence-reporting scheme.

GM2 IAM.GEN.VCA.100 Pilot responsibilities

FLIGHT TIME, DUTY TIME AND REST REQUIREMENTS

- (a) Point IAM.GEN.VCA.100(b)(4) does not reckon that VCA operators, their pilots and other crew members should comply with the flight time, duty time and rest requirements (FTL) contained in Subpart FTL of Regulation (EU) No 965/2012³ which applies to aircrew in CAT operations with aeroplanes.

² Regulation (EU) No 376/2014 of the European Parliament and of the Council of 3 April 2014 on the reporting, analysis and follow-up of occurrences in civil aviation, amending Regulation (EU) No 996/2010 of the European Parliament and of the Council and repealing Directive 2003/42/EC of the European Parliament and of the Council and Commission Regulations (EC) No 1321/2007 and (EC) No 1330/2007 (OJ L 122, 24.4.2014, p. 18) (<http://data.europa.eu/eli/reg/2014/376/oj>).

³ Commission Regulation (EU) No 965/2012 of 5 October 2012 laying down technical requirements and administrative procedures related to air operations pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 296, 25.10.2012, p. 1) (<http://data.europa.eu/eli/reg/2012/965/oj>).

- (b) With regard to VCA operations, flight time, duty time and rest requirements are established by the operator in accordance with the relevant requirements specified in the national law of the Member State in which the operator has its principal place of business, or, where the operator has no principal place of business, the place where the operator is established or resides.

AMC2 IAM.GEN.VCA.100 Pilot responsibilities

ALCOHOL CONSUMPTION

The operator should issue instructions concerning the consumption of alcohol by crew members. The instructions should not be less restrictive than the following:

- (a) no alcohol should be consumed for at least 8 hours before the specified reporting time for a flight duty period or the commencement of standby;
- (b) the blood alcohol concentration (BAC) should not exceed the lower limit of that defined in national regulations or 0.02 %, which is 0.2 grams of alcohol per litre of blood, at the start of a flight duty period;
- (c) no alcohol should be consumed during the flight duty period or while on standby.

GM3 IAM.GEN.VCA.100 Pilot responsibilities

ELAPSED TIME BEFORE RETURNING TO FLYING DUTY

- (a) 24 hours is a suitable minimum period of time to be allowed for before returning to flying duties after normal blood donation or normal recreational (sport) diving with compressed air.
- (b) Information on the effects of medication, drugs, other treatments and alcohol may be found in Annex IV (Part-MED) to Regulation (EU) No 1178/2011⁴.

AMC1 IAM.GEN.VCA.105 Responsibilities of the pilot-in-command (PIC)

INITIATION (COMMENCEMENT) OF FLIGHT

The PIC should only commence a flight provided the PIC is satisfied that:

- (a) the instruments and equipment required for the execution of the particular flight are installed in the VCA and are operative, unless operation with inoperative equipment is permitted by the minimum equipment list (MEL) or equivalent document;
- (b) the mass of the VCA and the centre of gravity (CG) location are such that the flight can be conducted within the limits prescribed in the airworthiness documentation;
- (c) all baggage and cargo are properly unloaded and secured;

⁴ Commission Regulation (EU) No 1178/2011 of 3 November 2011 laying down technical requirements and administrative procedures related to civil aviation aircrew pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council (OJ L 311, 25.11.2011, p. 1) (<http://data.europa.eu/eli/reg/2011/1178/oj>).

- (d) the VCA operating limitations as specified in the VCA flight manual (AFM) will not be exceeded at any time during the flight;
- (e) the PIC and other crew members under the PIC's authority are properly rated and meet competency and recency requirements;
- (f) the crew members under the PIC's authority are not incapacitated by any cause such as injury, sickness, fatigue or the effects of any psychoactive substance and are able to perform their duties;
- (g) any navigational database required for the flight is suitable and current.

GM1 IAM.GEN.VCA.105 Responsibilities of the pilot-in-command (PIC)

MEANING OF 'ENSURE'

The verb 'ensure' in the context of PIC responsibilities means that the PIC should make every reasonable endeavour to obtain the required result, either directly or through another person that is under the PIC's authority.

AMC2 IAM.GEN.VCA.105 Responsibilities of the pilot-in-command (PIC)

AUTHORITY OF THE PIC

The operator should ensure that the PIC has the authority to:

- (a) disembark any person, or offload any part of the cargo, that may represent a potential hazard to the safety of the VCA or its occupants;
- (b) not allow a person to be carried in the VCA who appears to be under the influence of alcohol or drugs to the extent that the safety of the VCA or its occupants is likely to be endangered;
- (c) refuse transportation of inadmissible passengers, deportees or persons in custody if their carriage increases the risk to the safety of the VCA or its occupants.

AMC3 IAM.GEN.VCA.105 Responsibilities of the pilot-in-command (PIC)

PRESERVATION OF FLIGHT RECORDER RECORDINGS

The PIC should ensure that in the event of an occurrence that is subject to reporting in accordance with point ORO.GEN.160(a), or if the preservation of recordings of the flight recorder is directed by the investigating authority:

- (a) the recordings of the flight recorder are not intentionally erased; and
- (b) precautionary measures to preserve the recordings of the flight recorder are taken before leaving the VCA.

GM2 IAM.GEN.VCA.105 Responsibilities of the pilot-in-command (PIC)

ACCEPTANCE OF THE VCA WITH UNSERVICEABILITY

The acceptance of the VCA with unserviceability in accordance with the configuration deviation list (CDL) or the minimum equipment list (MEL) and the VCA technical logbook may be supported by maintenance or other personnel, if properly licensed.

AMC4 IAM.GEN.VCA.105 Responsibilities of the pilot-in-command (PIC)

BIRD HAZARD AND BIRD STRIKE

- (a) Whenever a potential bird hazard is observed, the PIC should inform the appropriate ATS unit as soon as his or her workload allows.
- (b) In case of a bird strike that results in significant damage to the VCA or the loss or malfunction of any essential service, the PIC should submit a written bird strike report to the competent authority after landing in accordance with point ORO.GEN.160.

GM1 IAM.GEN.VCA.130 Powering-on of lift and thrust units

INTENT OF THE RULE

- (a) The lift and thrust units are powered on:
 - (1) for the purpose of flight; this is the intent of point IAM.GEN.VCA.130; or
 - (2) for maintenance purposes or for parking.
- (b) Lift and thrust unit engagement for the purpose of flight: the PIC does not leave the controls when the lift and thrust units are powered on.
- (c) Engagement of lift and thrust units for the purpose of maintenance or parking: point IAM.GEN.VCA.130 does not prevent ground runs or ground taxi from being conducted by qualified and authorised personnel other than pilots.

AMC1 IAM.GEN.VCA.140 Portable electronic devices (PEDs)

USE OF PEDS ONBOARD VCA

- (a) The IAM operator should comply with AMC1 CAT.GEN.MPA.140 as regards the technical prerequisites for the use of PEDs.
- (b) The IAM operator should comply with AMC2 CAT.GEN.MPA.140 as regards the procedures for the use of PEDs.

GM1 IAM.GEN.VCA.140 Portable electronic devices (PEDs)

USE OF PEDS ON BOARD VCA

Useful guidance material about the use of PEDs may be found in:

- GM1 CAT.GEN.MPA.140,
- GM2 CAT.GEN.MPA.140, and
- GM3 CAT.GEN.MPA.140.

AMC1 IAM.GEN.VCA.141 Use of electronic flight bags (EFBs)

EFB HARDWARE AND SOFTWARE APPLICATIONS

- (a) The IAM operator should comply with AMC1 CAT.GEN.MPA.141(a) as regards the EFB hardware.
- (b) The IAM operator should comply with AMC1 CAT.GEN.MPA.141(b) as regards the classification of EFB applications.
- (c) The IAM operator should comply with AMC2 CAT.GEN.MPA.141(b) as regards type A EFB applications. The term 'airport' should be understood to also mean 'vertiport' in the case of IAM operations.
- (d) The IAM operator should comply with AMC3 CAT.GEN.MPA.141(b) for type B EFB applications. The term 'airport' should be understood to also mean 'vertiport' in the case of IAM operations.

GM1 IAM.GEN.VCA.141 Use of electronic flight bags (EFBs)

USE OF EFBs

Useful guidance material about the use of EFBs may be found in:

- GM1 CAT.GEN.MPA.141,
- GM2 CAT.GEN.MPA.141,
- GM1 CAT.GEN.MPA.141(a),
- GM1 CAT.GEN.MPA.141(b), and
- GM2 CAT.GEN.MPA.141(b).

AMC1 IAM.GEN.VCA.145 Information on emergency and survival equipment carried on board VCA

ITEMS FOR COMMUNICATION TO THE RESCUE COORDINATION CENTRE

The list containing information on the emergency and survival equipment should include, as applicable, the number, colour and type of life rafts and pyrotechnics, details of emergency medical supplies (e.g. first-aid kits, emergency medical kits), water supplies, and the type and frequencies of the emergency portable radio equipment.

GM1 IAM.GEN.VCA.155 Carriage of weapons of war and munitions of war

WEAPONS OF WAR AND MUNITIONS OF WAR

- (a) Considering the increased security risks during VCA operations in congested areas or in other sensitive areas, the carriage of weapons of war on board VCA should not be permitted. Weapons of war carried by sky marshals or bodyguards may be allowed under strict conditions, but this is rather an exception and not a regular operation.
- (b) There is no internationally agreed definition of weapons of war and munitions of war. Some States may have defined them for their particular purposes or for national needs.
- (c) It is the responsibility of the operator to check with the State(s) concerned whether or not a particular weapon or munition is regarded as a weapon of war or munition of war. For the purpose of granting approvals for the carriage of weapons of war or munitions of war, the State(s) concerned is (are) that (those) of origin, transit, overflight and destination of the consignment and the State of the operator.

AMC1 IAM.GEN.VCA 160 Carriage of sporting weapons and ammunition

STOWAGE IN THE VCA

- (a) If sporting weapons cannot be stowed in a place that is inaccessible to passengers with all ammunition unloaded, they should not be accepted for carriage. Exemptions may be made by the competent authority on a case-by-case basis.
- (b) If the VCA does not have a separate compartment where sporting weapons can be stowed, they should be stowed so that they are not immediately accessible to passengers, e.g. in locked boxes, in checked passenger baggage that is stowed under other baggage, or under fixed netting.
- (c) As regards unloaded ammunition of sporting weapons, it may be carried separately in passengers' checked baggage, in accordance with the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284-AN/905).

GM1 IAM.GEN.VCA.160 Carriage of sporting weapons and ammunition

SPORTING WEAPONS

- (a) In accordance with Regulation (EC) No 300/2008⁵, sporting weapons may be carried on board an aircraft, in a place that is not inaccessible, if the required security conditions in accordance with national laws fulfilled and an authorisation has been granted by the State(s) involved.

⁵ Regulation (EC) No 300/2008 of the European Parliament and of the Council of 11 March 2008 on common rules in the field of civil aviation security and repealing Regulation (EC) No 2320/2002 (OJ L 97, 9.4.2008, p. 72) (<http://data.europa.eu/eli/reg/2008/300/oj>).

(b) There is no internationally agreed definition of sporting weapons. In general, it may be any weapon that is not a weapon of war or munitions of war. Sporting weapons include hunting knives, bows and other similar articles. An antique weapon, which at one time may have been a weapon of war or munitions of war, such as a musket, may now be regarded as a sporting weapon.

(c) A firearm is any gun, rifle or pistol that fires a projectile.

The following firearms are generally regarded as sporting weapons:

- (1) those designed for shooting games, shooting birds and other animals;
- (2) those used for target shooting, clay-pigeon shooting and competition shooting, provided the weapons are not those on standard issue to military forces; and
- (3) airguns, dart guns, starting pistols, etc.

A firearm, which is not a weapon of war or munitions of war, should be treated as a sporting weapon for the purpose of being carried on a VCA.

AMC1 IAM.GEN.VCA.170 Psychoactive substances

POLICY ON THE PREVENTION OF MISUSE OF PSYCHOACTIVE SUBSTANCES

- (a) The IAM operator should comply with AMC1 CAT.GEN.MPA.170(b) and AMC2 CAT.GEN.MPA.170(b) as regards the policy on the prevention of misuse of psychoactive substances.
- (b) The reference to point CAT.GEN.MPA.215 in AMC1 CAT.GEN.MPA.170(b) should be considered as a reference to point IAM.GEN.VCA.176.

GM1 IAM.GEN.VCA.170 Psychoactive substances

POLICY ON THE PREVENTION AND DETECTION OF MISUSE OF PSYCHOACTIVE SUBSTANCES

Other useful guidance material with regard to the policy on the prevention and detection of misuse of psychoactive substances by crew members may be found in:

- GM1 CAT.GEN.MPA.170(b),
- GM2 CAT.GEN.MPA.170(b),
- GM3 CAT.GEN.MPA.170(b), and
- GM4 CAT.GEN.MPA.170(b).

AMC2 IAM.GEN.VCA.170 Psychoactive substances

OBJECTIVE, TRANSPARENT AND NON-DISCRIMINATORY TESTING PROCEDURE

The IAM operator should refer to AMC1 CAT.GEN.MPA.170(c) when developing and implementing an objective, transparent and non-discriminatory testing procedure.

AMC1 IAM.GEN.VCA.175 Endangering safety

PSYCHOLOGICAL ASSESSMENT

The IAM operator should refer to AMC1 CAT.GEN.MPA.175(b) for the psychological assessment of its flight crew.

GM1 IAM.GEN.VCA.175 Endangering safety

PSYCHOLOGICAL ASSESSMENT

Useful guidance on conducting a psychological assessment may be found in GM1 CAT.GEN.MPA.175(b).

AMC2 IAM.GEN.VCA.175 Endangering safety

INTERNAL ASSESSMENT FOR NON-COMPLEX IAM OPERATORS

- (a) A non-complex IAM operator in accordance with AMC1 ORO.GEN.200(b) may replace the psychological assessment with an internal assessment of the psychological attributes and suitability of its flight crew.
- (b) The internal assessment conducted by non-complex operators of VCA should, as far as possible, apply the same principles as the psychological assessment before commencing line flying for complex operators.

AMC1 IAM.GEN.VCA.176 Pilot support programme

SUPPORT PROGRAMME

The IAM operator should comply with:

- (a) AMC1 CAT.GEN.MPA.215 as regards the principles governing a pilot support programme;
- (b) AMC2 CAT.GEN.MPA.215 as regards the confidentiality and protection of data;
- (c) AMC3 CAT.GEN.MPA.215 as regards the elements of a pilot support programme; and
- (d) AMC4 CAT.GEN.MPA.215 as regards both operator and pilot training and awareness.

GM1 IAM.GEN.VCA.176 Pilot support programme

SUPPORT PROGRAMME

Useful guidance material about the support programme may be found in:

- GM1 CAT.GEN.MPA.215,
- GM2 CAT.GEN.MPA.215,
- GM3 CAT.GEN.MPA.215,
- GM4 CAT.GEN.MPA.215,
- GM5 CAT.GEN.MPA.215,

- GM6 CAT.GEN.MPA.215,
- GM7 CAT.GEN.MPA.215, and
- GM8 CAT.GEN.MPA.215.

AMC1 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

PRESERVATION OF RECORDED DATA FOR INVESTIGATION

The IAM operator should comply with AMC1 CAT.GEN.MPA.195(a) as regards the preservation of recorded data for investigation purposes.

GM1 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

RECORDER REMOVAL FOR INVESTIGATION PURPOSES

Useful guidance material as regards the need to remove the recorder from the VCA may be found in GM1 CAT.GEN.MPA.195(a).

AMC2 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

INSPECTION AND CHECK OF RECORDINGS

- (a) The IAM operator should comply with AMC1 CAT.GEN.MPA.195(b) as regards the inspection and check of recordings, to the extent applicable to IAM operations and VCA.
- (b) In point (c) of AMC1 CAT.GEN.MPA.195(b), the references to point CAT.IDE.A.191 and CAT.IDE.H.191 should be considered as a reference to point UAM.IDE.MVCA.191.

GM2 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

INSPECTION OF FLIGHT RECORDER RECORDINGS TO ENSURE SERVICEABILITY

- (a) Useful guidance material as regards the inspection of the flight recorder recordings to ensure serviceability, to the extent applicable to IAM operations and VCA, may be found in GM1 CAT.GEN.MPA.195(b).
- (b) In point (b) of GM1 CAT.GEN.MPA.195(b), the references to point CAT.GEN.MPA.195(f)(1a) should be considered as a reference to point IAM.GEN.VCA.195(f)(2).
- (c) In point (d) of GM1 CAT.GEN.MPA.195(b), the references to point CAT.GEN.MPA.195(f)(3a) should be considered as a reference to point IAM.GEN.VCA.195(f)(5).

GM3 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

MONITORING AND CHECKING THE PROPER OPERATION OF FLIGHT RECORDERS — EXPLANATION OF TERMS

For the understanding of the terms used in point IAM.GEN.VCA.195(b) and in AMC1 IAM.GEN.VCA.195(b), the IAM operator should refer to GM2 CAT.GEN.MPA.195(b).

AMC3 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

USE OF AUDIO RECORDINGS TO MAINTAIN OR IMPROVE SAFETY

- (a) The IAM operator should comply with AMC1 CAT.GEN.MPA.195(f)(1) as regards the use of audio recordings for the purpose of maintaining or improving safety.
- (b) The reference in point (b) of AMC1 CAT.GEN.MPA.195(f)(1) to point CAT.GEN.MPA.195(f)(1) should be considered as a reference to point IAM.GEN.VCA.195(f)(1).

AMC4 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

INSPECTION OF AUDIO RECORDINGS TO ENSURE SERVICEABILITY

The IAM operator should comply with AMC1 CAT.GEN.MPA.195(f)(1a) as regards the inspection of audio recordings for the purpose of ensuring serviceability.

AMC5 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

USE OF IMAGES FROM THE FLIGHT CREW COMPARTMENT TO MAINTAIN OR IMPROVE SAFETY

The IAM operator should comply with AMC1 CAT.GEN.MPA.195(f)(3) as regards the use of images from the flight crew compartment for the purpose of maintaining or improving safety.

AMC6 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

INSPECTION OF IMAGES OF THE FLIGHT CREW COMPARTMENT TO ENSURE SERVICEABILITY

The IAM operator should comply with AMC1 CAT.GEN.MPA.195(f)(3a) as regards the inspection of images of the flight crew compartment for the purpose of ensuring serviceability.

GM4 IAM.GEN.VCA.195 Preservation, production, protection and use of recorder recordings

FLIGHT CREW COMPARTMENT

If there are no compartments to physically segregate the flight crew from the passengers during the flight, the 'flight crew compartment' referred to in point (f)(5) of point IAM.GEN.VCA.195 is understood to refer to the area that comprises:

- (a) the flight crew seats;
- (b) the VCA and engine controls;
- (c) the VCA instruments;
- (d) the windshield and windows used by the flight crew to get an external view while seated at their duty station; and
- (e) the circuit breakers accessible by the flight crew while seated at their duty station.

GM1 IAM.GEN.VCA.200 Transport of dangerous goods under a specific approval

APPLICABLE TECHNICAL INSTRUCTIONS

The applicable technical instructions are the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284-AN/905).

AMC1 IAM.GEN.VCA.200 Transport of dangerous goods under a specific approval

REPORTING OF ACCIDENTS AND INCIDENTS THAT INVOLVE DANGEROUS GOODS

- (a) Accidents or incidents involving dangerous goods, the discovery of undeclared or misdeclared dangerous goods, as well as the finding of dangerous goods carried by passengers or crew members, or in their baggage, when not in accordance with Part 8 of the Technical Instructions, should be reported. The reporting of undeclared and misdeclared dangerous goods found in cargo also applies to items of the operators' stores that are classified as dangerous goods.
- (b) The first report should be dispatched within 72 hours of the event. It may be sent by any means, including email, telephone or fax. The report should include the details that are known at that time. If necessary, a subsequent report should be sent as soon as possible giving all the details that were not known at the time the first report was sent. If a report has been made verbally, written confirmation should be sent as soon as possible.
- (c) The first and any subsequent report should be as precise as possible and should contain the following data, where relevant:
 - (1) date of the incident or accident or the finding of undeclared or misdeclared dangerous goods;

- (2) location and flight date;
 - (3) description of the goods and the reference number of the air waybill, pouch, baggage tag, ticket, etc.;
 - (4) proper shipping name (including the technical name, if appropriate) and UN/ID number, when known;
 - (5) class or division and any subsidiary risk;
 - (6) type of packaging, and the packaging specification marking on it;
 - (7) quantity;
 - (8) name and address of the shipper, passenger, etc.;
 - (9) any other relevant details;
 - (10) suspected cause of the incident or accident;
 - (11) action taken;
 - (12) any other reporting action taken; and
 - (13) name, title, address and telephone number of the person that makes the report.
- (d) Copies of relevant documents and any photographs taken should be attached to the report.
- (e) A dangerous goods accident or incident may also constitute an accident, a serious incident or an incident with the VCA. The criteria for reporting both types of occurrences should be met.
- (f) The following dangerous goods reporting form should be used, but other forms, including electronic transfer of data, may be used provided that at least the minimum information of this AMC is supplied:

DANGEROUS GOODS OCCURRENCE REPORT		DGOR No:
1. Operator:	2. Date of occurrence:	3. Local time of occurrence:
4. Flight date:		5. Flight ID number:
6. Departure aerodrome (vertiport):		7. Destination aerodrome (vertiport):
8. VCA type:		9. VCA registration:
10. Location of occurrence:		11. Origin of the goods:
12. Description of the occurrence, including details of injury, damage, etc. (if necessary, continue on the reverse of this form):		

DANGEROUS GOODS OCCURRENCE REPORT
DGOR No:

13. Proper shipping name (including the technical name):			14. UN/ID No (when known):
15. Class/division (when known):	16. Subsidiary risk(s):	17. Packing group:	18. Category (Class 7 only):
19. Type of packaging:	20. Packaging specification marking:	21. No of packages:	22. Quantity (or transport index, if applicable):
23. Reference No of airway bill:			
24. Reference No of courier pouch, baggage tag, or transport document:			
25. Name and address of shipper, agent, passenger, etc.:			
26. Other relevant information (including suspected cause, any action taken):			
27. Name and title of the person that makes the report:		28. Telephone No:	
29. Company:		30. Reporter(s) ref.:	
31. Address:		32. Signature:	
		33. Date:	
Description of the occurrence (continuation)			

Notes for the completion of the form:

1. A dangerous goods accident is as defined in Annex I. For this purpose, serious injury is as defined in Regulation (EU) No 996/2010⁶.
2. This form should also be used to report any occasion when undeclared or misdeclared dangerous goods are discovered in cargo, mail or unaccompanied baggage, or when accompanied baggage contains dangerous goods which passengers or crew are not permitted to take on the VCA.
3. The initial report should be dispatched unless exceptional circumstances prevent this. This occurrence report form, duly completed, should be sent as soon as possible, even if all the information is not available.

⁶ Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation and repealing Directive 94/56/EC (OJ L 295, 12.11.2010, p. 35) (<http://data.europa.eu/eli/reg/2010/996/oj>).

4. Copies of all relevant documents and any photographs taken should be attached to this report.
5. Any further information, or any information not included in the initial report, should be sent as soon as possible to the authorities specified in point IAM.GEN.VCA.200(f).
6. Provided it is safe to do so, all dangerous goods, packaging, documents, etc., relating to the occurrence should be retained until after the initial report has been sent to the authorities specified in IAM.GEN.VCA.200(f), and they have indicated whether or not these should continue to be retained.

GM2 IAM.GEN.VCA.200 Transport of dangerous goods under a specific approval

GENERAL

- (a) The Technical Instructions provide that, in certain circumstances, dangerous goods, which are normally forbidden on a VCA, may be carried on board. In these circumstances, all the States concerned may grant exemptions from the provisions of the Technical Instructions provided that an overall level of safety which is at least equivalent to that provided for by the Technical Instructions is achieved.

The Technical Instructions also make provision for some dangerous goods to be carried only when an approval has been granted both by the State of origin and the State of the operator.

- (b) When an exemption is required, the States concerned are those of origin, transit, overflight and destination of the consignment and that of the operator. For the State of overflight, if none of the criteria for granting an exemption are relevant, an exemption may be granted based solely on whether it is believed that an equivalent level of safety in air transport has been achieved.
- (c) The Technical Instructions provide that exemptions and approvals are granted by the 'appropriate national authority', which is intended to be the authority responsible for the particular aspect against which the exemption or approval is being sought. The Technical Instructions do not specify who should seek exemptions and, depending on the legislation of the particular State, this may mean the operator, the shipper or an agent. If an exemption or approval has been granted to other than the operator, the operator should ensure that a copy has been obtained before the relevant flight is conducted. The operator should ensure that all relevant conditions of an exemption or approval are met.
- (d) The exemption or approval referred to in points (a) to (c) is in addition to the approval required by Annex V (Part-SPA), Subpart G.

GM1 IAM.GEN.VCA.205 Transport of dangerous goods without a specific approval

APPLICABLE TECHNICAL INSTRUCTIONS

The applicable technical instructions are the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284-AN/905).

GM2 IAM.GEN.VCA.205 Transport of dangerous goods without a specific approval

GENERAL

No specific approval for the transport of dangerous goods by air is required when:

- (a) they are not subject to the Technical Instructions in accordance with Part 1 thereof; or
- (b) they are carried by passengers or crew, or are in baggage, in accordance with Part 8 of the Technical Instructions.

AMC1 IAM.GEN.VCA.205 Transport of dangerous goods without a specific approval

DANGEROUS GOODS TRAINING PROGRAMME

The training programme should meet the requirements of ICAO Annex 18 and the applicable requirements of the Technical Instructions, Part 1, Chapter 4.

AMC2 IAM.GEN.VCA.205 Transport of dangerous goods without a specific approval

REPORTING OF ACCIDENTS AND INCIDENTS THAT INVOLVE DANGEROUS GOODS

Accidents or incidents that involve dangerous goods, the discovery of undeclared dangerous goods, as well as the finding of dangerous goods carried by passengers or crew members, or in their baggage, when not in accordance with Part 8 of the Technical Instructions, should be reported in accordance with AMC1 IAM.GEN.VCA.200 as applicable.

AMC1 IAM.GEN.MVCA.135 Admission to the flight crew compartment

ADMISSION/CARRIAGE OF PASSENGERS TO/IN THE FLIGHT CREW COMPARTMENT

When a VCA is used in a single-pilot operation and has more than one pilot station, passengers may be carried in the unoccupied pilot seat(s), provided that the commander is satisfied that:

- (a) this will not cause distraction or interference with the operation of the flight; and
- (b) the passenger(s) that occupies (occupy) the pilot seat(s) is (are) familiar with the relevant restrictions and safety procedures.

GM1 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

DIGITAL MEDIA

The IAM operator may use digital media such as EFBs that host type A and/or type B EFB applications as an alternative to the carriage of documents, manuals and information in paper on each flight, in accordance with point IAM.GEN.VCA.141.

GM2 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

CERTIFIED TRUE COPIES

- (a) Certified true copies may be provided:
 - (1) either directly by the competent authority;
 - (2) or by persons (e.g. public notaries, authorised officials in public services) that are authorised to certify official documents in accordance with the applicable Member State's legislation.
- (b) Translations of the air operator certificate (AOC), including operations specifications, do not need to be certified.

GM3 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

'JOURNEY LOG OR EQUIVALENT'

'Journey log or equivalent' means that the required information may be recorded in a document other than a logbook, such as the operational flight plan or the VCA technical log.

AMC2 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

PROCEDURES AND VISUAL SIGNALS TO BE USED BY INTERCEPTING AND INTERCEPTED AIRCRAFT

The procedures and visual signals to be used by intercepting and intercepted aircraft should reflect those contained in Regulation (EU) No 923/2012. They may be part of the operations manual.

AMC3 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

APPROPRIATE METEOROLOGICAL INFORMATION

- (a) The appropriate meteorological information should be relevant to the planned operation, as specified in point (a) of point MET.TR.215 of Annex V (Part-MET) to Regulation (EU) 2017/373⁷, and comprise the following:
- (1) the meteorological information that is specified in point (e) of point MET.TR.215 of Part-MET; and/or
 - (2) supplemental meteorological information:
 - (i) information other than that specified in point (a) above, which should be based on data from certified meteorological service providers; or
 - (ii) information from other reliable sources of meteorological information that should be evaluated by the operator.
- (b) The providers of meteorological information specified in point (e) of point MET.TR.215 should be certified meteorological services providers that meet the necessary oversight and certification requirements as specified in Part-MET.
- (c) All the following should qualify as supplemental meteorological information:
- (1) a reliable, timestamped image from a serviceable digital camera of known location, bearing, and altitude, which shows the weather conditions in the approach path at destination;
 - (2) a meteorological observation from a properly trained observer; and
 - (3) a report from non-certified automatic weather observation systems to which the operator should apply relevant margins based on the reliability and precision of the system.

GM4 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

DATA FROM CERTIFIED METEOROLOGICAL SERVICE PROVIDERS

The supplemental meteorological information, in the context of point (a)(2)(i) of AMC3 IAM.GEN.MVCA.180, should originate only from authoritative sources or certified providers and should not be transformed or tampered, except for the purpose of presenting the data in the correct format.

⁷ Commission Implementing Regulation (EU) 2017/373 of 1 March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, (EU) No 1035/2011 and (EU) 2016/1377 and amending Regulation (EU) No 677/2011 (OJ L 62, 8.3.2017, p. 1) (http://data.europa.eu/eli/reg_impl/2017/373/oj).

GM5 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

INFORMATION FROM OTHER RELIABLE SOURCES OF METEOROLOGICAL INFORMATION

- (a) Other reliable sources of meteorological information, in the context of point (a)(2)(ii) of AMC3 IAM.GEN.MVCA.180, are organisations that can provide an appropriate level of data assurance in terms of accuracy and integrity.
- (b) For the purpose of evaluating such organisations, the operator should consider whether the organisation has established a quality assurance system to cover source selection, acquisition/import, processing, validity period check, and distribution phase of data.

GM6 IAM.GEN.MVCA.180 Documents, manuals and information to be carried on board each flight

SUPPLEMENTARY INFORMATION

Supplementary information is information included in point (e) of point MET.TR.215 of Part-MET and refers to meteorological information to be reported in specific cases such as freezing precipitation, blowing snow, thunderstorm, etc.

GM1 IAM.GEN.MVCA.181 Documents and information that may not be carried on board

MEANING OF 'LOCAL AREA'

The 'local area' is defined by the competent authority of the operator, in a radius of nautical miles or otherwise.

GM1 UAM.OP.VCA.125 Taxiing and ground movement

GENERAL

- (a) Taxiing (in the air and on the ground) is the movement of a VCA under its own power.
- (b) Air taxiing, hover taxiing and taxiing on the ground with passengers on board for the purpose of flight or after landing are considered critical phases of flight (Definition (31)). Due to the safety-critical nature of these types of taxiing, they are performed by an appropriately qualified pilot at the controls of the VCA.
- (c) Taxiing on the ground without passengers on board for a purpose other than taking off, e.g. for repositioning or maintenance, is not considered a critical phase of flight. This type of taxiing may, therefore, be performed either by an appropriately qualified pilot or by personnel other than pilots, designated by the IAM operator, if appropriately trained for the task.
- (d) Ground movement is the movement of a VCA with the support of external equipment or accessory that is not powered by the VCA. It is advisable that the operation of such equipment,

including when automated or autonomous, is carried out by suitably trained personnel, even if that personnel only monitors the functioning of the systems.

AMC1 UAM.OP.VCA.125 Taxiing and ground movement

PROCEDURES FOR THE TAXIING OF VCA ON THE GROUND

- (a) The IAM operator should take into account the particular operational environment at the vertiport, diversion location or VEMS operating site being used for the operation(s) when establishing procedures for taxiing on the ground.
- (b) These procedures should include at least the following:
 - (1) instructions on the use of standard radiotelephony (RTF) phraseology;
 - (2) instructions on the use of lights, if applicable;
 - (3) measures to enhance the situational awareness, such as the use of the layout charts of a particular vertiport, diversion location or VEMS operating site as, applicable;
 - (4) instructions on the avoidance of actions which may create distraction from the taxiing activity.
- (c) The operator's procedures for ground taxiing without passengers on board for a purpose other than taking off should in particular ensure that the lift and thrust units of the VCA are not powered on inadvertently by the person designated in accordance with point UAM.OP.VCA.125(b)(2).

AMC2 UAM.OP.VCA.125 Taxiing and ground movement

PROCEDURES FOR THE GROUND MOVEMENT OF VCA

- (a) The operator's procedures for the ground movement of VCA should take into consideration at least the following:
 - (1) VCA dimensions, proper movement speed and VCA turning arcs;
 - (2) measures to maintain overall situational awareness of the location and movement of the VCA and of other traffic at the vertiport, diversion location or VEMS operating site;
 - (3) measures to keep the VCA being moved within the appropriate designated areas.
- (b) The operator's procedures for the ground movement of VCA should include instructions for team members involved in the ground movement of VCA to follow and adhere to all operational and safety procedures during the VCA movement and to communicate among them to prevent accidents.

AMC3 UAM.OP.VCA.125 Taxiing and ground movement

DESIGNATED PERSONS

The operator should only designate a person other than a pilot for the ground taxiing of the VCA on the movement area of a vertiport, diversion location or VEMS operating site, if that person:

- (a) is trained in ground taxiing of the VCA;
- (b) is trained to use the radio telephone;
- (c) has received instruction in respect of the layout of the vertiport, diversion location or VEMS operating site, as applicable, and the routes, signs, markings and lights thereon;
- (d) has received instruction in respect of air traffic control (ATC) signals and instructions, phraseology and procedures, if applicable;
- (e) can conform to the operational standards required for a safe ground taxiing at the vertiport, diversion location or VEMS operating site.

AMC1 UAM.OP.VCA.135 Routes and areas of operation

USE OF DESIGNATED ROUTES

If the competent authority responsible for the airspace where the VCA is or will be operated has designated routes for VFR day operations with VCA to account for potential ground risks and potential risk of collision with other aircraft or for airspace management purposes, the operator should ensure that its VCA operations are only conducted along those routes.

GM1 UAM.OP.VCA.135 Routes and areas of operation

USE OF DIVERSION LOCATIONS

The actions needed to make a diversion location comply with the requirements, such as those related to availability and adequacy, may be subcontracted (for example, to the owner of the land or any third party) in accordance with point ORO.GEN.205. The IAM operator should ensure, in particular, that the services provided by the subcontractor are appropriately integrated to its flight preparation and operations management processes.

AMC1 UAM.OP.VCA.145 Establishment of minimum flight altitudes

CONSIDERATIONS WHEN ESTABLISHING MINIMUM FLIGHT ALTITUDES

- (a) When establishing minimum flight altitudes for flights to be conducted in accordance with VFR by day, the operator should consider all the following:
 - (1) the VFR minimum heights specified in point SERA.5005(f) of Regulation (EU) No 923/2012 or the minimum heights established by the competent authority above those stipulated in point SERA.5005(f) or the permission from the competent authority to fly at lower heights than those stipulated in point SERA.5005(f);
 - (2) the accuracy with which the position of the VCA can be determined;
 - (3) the probable inaccuracies in the indications of the altimeters used;
 - (4) the characteristics of the terrain, such as sudden changes in the elevation, along the routes or in the areas where operations are to be conducted;

- (5) the probability of encountering unfavourable meteorological conditions, such as severe turbulence and descending air currents;
- (6) the possible inaccuracies in aeronautical charts.
- (b) The operator should also consider:
 - (1) corrections for temperature and pressure variations from standard values;
 - (2) ATC requirements, if applicable; and
 - (3) any foreseeable contingencies along the planned route.

GM1 UAM.OP.VCA.190 Fuel/energy scheme — general

GENERAL

- (a) The fuel/energy scheme and, in particular, the final fuel/energy reserve and the additional fuel/energy depend on the certified minimum performance (CMP) of the VCA, established by considering the effect of single failures and combinations of failures that are not extremely improbable on the nominal performance parameters.

For some VCA designs, a failure or a combination of failures in the fuel/energy system may lead to the most detrimental effect on the aircraft range during cruise phase. Such failure(s) would then become, for the respective flight phase and performance parameter, the critical failure for performance (CFP).

The CFP affects the aircraft systems and CSFL ability. The CFP considers all types of failures that are not extremely improbable. Critical failures may be different per flight phase and performance parameter.

- (b) The CMP and CFP are defined in Annex I — definitions (133) and (135) respectively. Definitions of the CMP and CFP are also included in MOC VTOL.2000. The CMP is established during type certification, similarly to Category A helicopter's performance. Failures to be considered have been adapted for VCA, to be able to accommodate an arbitrary number of lift/thrust units and other systems affecting CSFL.
- (c) The goal of the fuel/energy scheme is to ensure that a flight can be conducted safely; in particular, that the VCA can reach the selected vertiport(s), diversion location(s) or VEMS operating site(s). For VCA that use conventional fuel for propulsion, this depends primarily on the quantity of fuel on board, while for VCA with electric propulsion it may be other factors that are critical, e.g. component temperature limitations following a CFP. For some configurations, it is likely that the VCA has plenty of remaining energy after a CFP but cannot reach a vertiport or a diversion location on a particular day because the energy is not accessible, e.g. in the case of component overheat.

The CMP data allows the operator to plan the range of the VCA if affected by the CFP, as well as other flight parameters such as rate of climb, thus assessing the suitability of vertiports, diversion locations or VEMS operating sites along the route before each flight.

AMC1 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

ESTIMATION OF THE FUEL/ENERGY CONSUMPTION

- (a) When, for the current conditions under which a flight is to be performed, no specific fuel/energy consumption data is provided in the AFM, the planned amount of usable fuel/energy for the flight should be based on conservative estimation of the fuel/energy consumption.
- (b) The estimation of the fuel/energy consumption for the current conditions under which the flight is to be performed may be obtained by interpolating known data provided in the AFM or by monitoring the real fuel/energy consumption.
- (c) In addition, for the estimation of the fuel/energy consumption, the most favorable regime should be considered for engine work at the intended density altitude and speed for the different phases of flight and the intended flight profile, as well as reported wind conditions.

GM1 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

NOTAMs

Pilots should review all available NOTAMs that affect their flight route before take-off. A good practice is to check NOTAMs early and often, both when planning the flight and on the day of operations.

NOTAMs can be accessed online and through automated pre-flight information systems.

AMC2 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

TRIP FUEL/ENERGY

The trip fuel/energy should include fuel/energy:

- (a) for take-off and climb from the departure vertiport elevation to initial cruising level/altitude, taking into account the expected departure routing;
- (b) from the top of climb to the top of descent;
- (c) from the top of descent to the point where the approach procedure is initiated;
- (d) for the approach and landing at the destination vertiport.

GM2 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

FUEL/ENERGY FOR LANDING

The amount of fuel/energy necessary for landing at the destination vertiport, from the LDP, is calculated once for the planned route.

AMC3 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

CONTINGENCY FUEL/ENERGY

The contingency fuel/energy should be equivalent to 10 % of the planned trip fuel/energy or, in the event of in-flight replanning, 10 % of the trip fuel/energy for the remainder of the flight.

GM3 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

CONTINGENCY FUEL/ENERGY — UNFORESEEN FACTORS

Unforeseen factors are those which could influence fuel consumption from the take-off vertiport to the destination vertiport, such as deviations of an individual VCA from the expected fuel consumption data, deviations from forecast meteorological conditions, extended delays and deviations from planned routings and/or cruising levels.

AMC4 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

FINAL FUEL/ENERGY RESERVE

- (a) For the purpose of final fuel/energy determination, the operator should use data and information provided in the AFM by the VCA manufacturer with regard to the representative time for a go-around and an approach. The representative time is established on the basis of an appropriate VCA configuration and speed, in conservative ambient conditions and conservative fuel/energy consumption, taking into account the certified minimum performance (CMP) of the VCA. The go-around and approach procedure should be executable in the current operating conditions.
- (b) The amount of final fuel/energy reserve carried on a flight as determined on the basis of point (a) should be sufficient for at least 5 minutes flying time at a VCA configuration and speed appropriate for a go-around and approach procedure.

GM4 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

FINAL FUEL/ENERGY RESERVE

- (a) The objective of the final fuel/energy reserve protection is to ensure that a safe landing can be performed when unforeseen circumstances may not allow the completion of the flight as originally planned.
- (b) For that purpose, the flight is planned in such a way that allows from any point along the route a safe landing to be performed with more than the final fuel/energy reserve remaining after the landing. If the final fuel/energy reserve can no longer be protected in flight, then a fuel emergency is declared.

GM5 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

FINAL FUEL/ ENERGY RESERVE

- (a) Operators may determine one final fuel/energy reserve value for each VCA type in their fleet, rounded up to an easily recalled figure.
- (b) In addition, there may be different calculations of the final fuel/energy reserves for each VCA type; for example, final fuel/energy reserve for vertical landing and a final fuel/energy reserve for a conventional landing.
- (c) ICAO Doc 9976 ‘Flight Planning and Fuel Management (FPFM) Manual’ and the EASA Fuel Implementation Manual⁸ provide further detailed guidance on the development of a comprehensive in-flight fuel management policy and related procedures.

AMC5 UAM.OP.VCA.191 Fuel/energy scheme — fuel/energy planning and in-flight replanning

ADDITIONAL FUEL/ENERGY

Additional fuel/energy needs should be determined during the pre-flight planning, taking into account the CMP data of the VCA and, in particular, a potentially lower total fuel/energy remaining after an assumed CFP and a potentially higher consumption after an assumed CFP.

AMC1 UAM.OP.VCA.195 Fuel/energy scheme — in-flight fuel/energy management

IN-FLIGHT FUEL/ENERGY CHECKS

- (a) The operator’s policy and procedures should ensure that the PIC monitors in-flight the remaining amount of usable fuel/energy and compares it with a conservative estimate of the fuel/energy necessary to proceed to the destination vertiport or the VEMS operating site where a safe landing can be performed, either through dynamic checks or checks at regular intervals of the fuel/energy measuring and displaying equipment.
- (b) If conservative estimations of the fuel/energy necessary to complete the remaining part of the flight are not provided by the fuel/energy measuring and displaying equipment in-flight, the operator’s policy and procedures should ensure that the following conservative estimations are made during the pre-flight fuel/energy planning for specified check points along the planned route:
 - (1) amount of fuel/energy necessary to complete the remaining portion of the flight to the destination vertiport or the VEMS operating site; and
 - (2) amount of fuel/energy necessary to reach a vertiport or a diversion location along the route.

⁸ [Fuel Management - New Rules | EASA Community](#)

The specified check points should be regularly distributed along the planned route to allow for the safe management of the fuel/energy in-flight.

The PIC should monitor in-flight the indications of the fuel/energy measuring and displaying equipment to establish the remaining usable amount of fuel/energy as the VCA proceeds towards the destination vertiport or the VEMS operating site and, at the specified check points, compare this amount with the conservative estimations for those check points made during the pre-flight fuel/energy planning.

- (c) The relevant fuel/energy data and estimations should be recorded by the operator's safety management system and retained for 5 years to be used as a follow-up to incidents and other technical reports and to identify and make adjustments to the fuel/energy system performance.

AMC2 UAM.OP.VCA.195 Fuel/energy scheme — in-flight fuel/energy management

ENSURING A SAFE LANDING

If an in-flight fuel/energy check performed in accordance with AMC1 UAM.OP.VCA.195 shows that the remaining amount of usable fuel/energy is less than the conservative estimation of the fuel/energy necessary to complete the flight to the destination vertiport or the VEMS operating site, plus the final fuel/energy reserve, the PIC should:

- (a) divert to a vertiport or a diversion location along the route selected in accordance with the individual fuel/energy scheme; or
- (b) replan the flight in accordance with point (d) of point UAM.OP.VCA.191.

GM1 UAM.OP.VCA.195 Fuel/energy scheme — in-flight fuel/energy management

DECLARING 'MINIMUM FUEL'

- (a) The 'MINIMUM FUEL' declaration informs the appropriate ATC unit that any change to the existing clearance, or air traffic delays, may result in landing with less final fuel/energy reserve. This is not an emergency situation, but an indication that an emergency situation is possible should any additional delay occur.
- (b) Guidance on declaring 'MINIMUM FUEL' is contained in ICAO Doc 9976 'Flight Planning and Fuel Management (PPFM) Manual'.

GM2 UAM.OP.VCA.195 Fuel/energy scheme — in-flight fuel/energy management

BROADCASTING 'MAYDAY MAYDAY MAYDAY FUEL'

The 'MAYDAY MAYDAY MAYDAY FUEL' declaration informs the ATC that the amount of final fuel/energy reserve may be consumed prior to landing.

The standard phraseology 'MAYDAY FUEL' describes the nature of the distress conditions as required in ICAO Annex 10 'Aeronautical Telecommunications' Volume II.

AMC1 UAM.OP.VCA.250 Ice and other contaminants — ground procedures

DE-ICING AND ANTI-ICING ON THE GROUND

- (a) The IAM operator should include de-icing and anti-icing policy and procedures for aircraft on the ground in its operations manual. The policy and procedures should include descriptions of the types and effects of icing and other contaminants on aircraft while stationary, during ground movements and during take-off.
- (b) In addition, a description of the fluid types used should be given, including the following:
 - (1) proprietary or commercial names;
 - (2) characteristics;
 - (3) effects on aircraft performance;
 - (4) hold-over times;
 - (5) precautions during usage.

GM1 UAM.OP.VCA.250 Ice and other contaminants — ground procedures

DE-ICING/ANTI-ICING

Useful guidance material as regards de-icing and anti-icing may be found in:

- GM1 CAT.OP.MPA.250, with guidance on terms used in the context of de-icing/anti-icing;
- GM2 CAT.OP.MPA.250, with guidance on de-icing and/or anti-icing procedures; and
- GM3 CAT.OP.MPA.250, with further guidance on de-icing and/or anti-icing.

GM1 UAM.OP.VCA.290 Proximity detection

TRAINING OBJECTIVES FOR THE USE OF PROXIMITY WARNING SYSTEMS

If a proximity warning system is installed on a VCA, the performance-based training objectives of GM1 CAT.OP.MPA.290 may be used for the pilot training programmes.

AMC1 UAM.OP.VCA.300 Approach and landing conditions

ASSESSMENT OF LANDING DISTANCE — VCA INTENDING TO LAND CONVENTIONALLY WITH ROLL-ON

- (a) The in-flight assessment of the landing distance should be based on the latest available weather report and runway condition report (RCR), or equivalent information based on the RCR.

- (b) The assessment should be initially carried out when the weather report and the RCR are obtained, usually around top of descent. If the planned duration of the flight does not allow the flight crew to carry out the assessment in non-critical phases of flight, the assessment should be carried out before departure.
- (c) If meteorological conditions are likely to lead to the degradation of the runway surface condition, the level of degradation of the runway surface friction characteristics that may be tolerated should also be considered in the assessment so that a quick decision can be made prior to landing.
- (d) The flight crew should monitor the evolution of the actual conditions during the approach to ensure that they do not degrade below the condition that was previously determined to be the minimum acceptable.

AMC2 UAM.OP.VCA.300 Approach and landing conditions

WIND DATA

- (a) The information on average wind contained in METAR/SPECI/ATIS reports should be the basis for landing performance calculations while instant wind information, if reported, should be monitored during the approach to ensure that the wind speed does not exceed the assumptions made for landing performance calculations.
- (b) If the AFM so requires, the operator should use instant wind information for landing performance calculations.

AMC3 UAM.OP.VCA.300 Approach and landing conditions

IN-FLIGHT DETERMINATION OF THE FINAL APPROACH AND TAKE-OFF AREA (FATO) CONDITION — VCA INTENDING TO LAND VERTICALLY

The in-flight determination of the FATO suitability for a safe approach, landing or missed approach should be based on the latest available meteorological or runway condition report, preferably not more than 30 minutes before the expected landing time.

GM1 UAM.OP.VCA.315 Flight hours — reporting

REPORTING OF FLIGHT HOURS

Flight hours may be reported either:

- (a) as flight hours flown by each VCA, identified by the VCA serial number and registration mark, during the previous calendar year; or
- (b) as total flight hours flown by each VCA, identified by the VCA serial number and registration mark, on the 31st of December of the previous calendar year.

AMC1 UAM.OP.MVCA.100 Use of air traffic services (ATS)

ELECTRONIC CONSPICUITY DEVICE

- (a) A manned VCA entering airspace designated as U-space airspace but not provided with air traffic control service by the ANSP should comply with point (c) of point SERA.6005 of Regulation (EU) No 923/2012.
- (b) The PIC should ensure that the electronic conspicuity device of the VCA operates correctly before entering U-space airspace until the VCA leaves U-space airspace.

GM1 UAM.OP.MVCA.100 Use of air traffic services (ATS)

IN-FLIGHT OPERATIONAL INSTRUCTIONS

When coordination with an appropriate ATS unit has not been possible, in-flight operational instructions do not relieve the PIC of the responsibility to obtain appropriate clearance from an ATS unit, if applicable, before making any change in the flight plan.

AMC1 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

SELECTION OF ADEQUATE VERTIPOINTS, DIVERSION LOCATIONS AND VEMS OPERATING SITES

- (a) The policy and procedures for the selection of adequate vertiports, diversion locations and VEMS operating sites should be part of the operator's fuel/energy scheme in accordance with point UAM.OP.VCA.190. The selected vertiports, diversion locations or VEMS operating sites should comply with point UAM.OP.MVCA.192.
- (b) If the VCA is certified for operations on floating surfaces in accordance with point UAM.IDE.MVCA.300(d), the operator should include floating surfaces in the fuel/energy scheme.

GM1 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

ADEQUATE VERTIPOINTS

- (a) The operator may use the EASA 'Prototype Technical Specifications for the Design of VFR Vertiports for Operation with Manned VTOL-Capable Aircraft Certified in the Enhanced Category' (PTS-VPT-DSN)⁹ or equivalent for the purpose of assessing the adequacy of vertiports for normal operations and for diversion from the planned route.
- (b) An aerodrome or heliport that meets point UAM.OP.MVCA.107(c) is considered an adequate vertiport for VCA operations.

⁹ [PTS-VPT-DSN.pdf](#)

- (c) For practical reasons, no requirements are specified regarding the adequacy of a site used for emergency landing.

AMC2 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

ADEQUATE DIVERSION LOCATIONS

To comply with point UAM.OP.MVCA.107(d), the operator's policy and procedure for the selection of diversion locations should be based on at least the following:

- (a) Data provided by the VCA manufacturer including:
- (1) certified minimum performance (CMP) including wind limitations;
 - (2) the radial component of the downwash (outwash) around the VCA;
 - (3) type of VCA landing systems (e.g. wheels, skids).
- (b) Information about the diversion location characteristics including:
- (1) size of the landing area;
 - (2) surface characteristics;
 - (3) slope;
 - (4) obstacle clearance areas;
 - (5) firefighting information, if any.
- (b) The operating conditions under which the flight is to be conducted including:
- (1) anticipated masses;
 - (2) anticipated VCA fuel/energy consumption;
 - (3) anticipated meteorological conditions.
- (c) Observations made during the process of pre-surveillance of diversion locations by a competent person. The operator should also take into account possible changes to the characteristics of diversion locations that may have taken place since last surveyed.
- (d) The means to have an indication on wind speed and direction.
- (e) Ground markings, if available.
- (f) The means to achieve an acceptable level of rescue and firefighting services (RFFS) protection, including equipment, or agreement with the local firefighting brigade or any other appropriate arrangement.
- (g) In the case of cross-border operations, the relevant requirements published by the competent authority of the place of operation stemming from air space management, air traffic management, national security, as well as environmental and administrative regulations.

AMC3 UAM.OP.MVCA.107 Adequate vertiport or adequate diversion location

DIVERSION LOCATIONS — DOCUMENTATION

- (a) Any diversion location selected by the IAM operator and planned to be used, as well as any subsequent changes to selected diversion locations, should be notified to the competent authority in accordance with the procedure referred to in point ORO.GEN.115(b) and point ORO.GEN.130(c) along with the criteria applied for the selection.
- (b) The operations manual or another manual of the IAM operator should contain diagrams or ground and aerial photographs, depiction (pictorial) and description of the selected diversion location including:
 - (1) its overall dimensions;
 - (2) its suitability with reference to VCA performance as well as the radial component of the downwash (outwash) around the VCA;
 - (3) the location and height of relevant obstacles in the approach and take-off flight paths and in the manoeuvring area of any diversion location;
 - (4) the approach and take-off flight paths;
 - (5) its surface condition (blowing dust/snow/sand);
 - (6) the provision of control of third parties on the ground, if applicable;
 - (7) current firefighting arrangements (equipment or agreement with the local firefighting brigade or any other appropriate arrangement);
 - (8) existing means indicating wind speed and direction;
 - (9) the procedure for its activation in accordance with national regulations, if applicable;
 - (10) other useful information; for example, details of the appropriate ATS agency and frequency;
 - (11) the evacuation paths for passengers, taking into account the VCA hazard areas; and
 - (12) the means to remove a VCA from a diversion location.

AMC4 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

USE OF EN-ROUTE DIVERSION LOCATIONS

- (a) En-route diversion locations should be so selected to enable:
 - (1) a CSFL of the VCA following a CFP or another abnormal condition or situation; and/or
 - (2) compliance with the final fuel/energy reserve requirements.
- (b) En-route diversion locations should not be used for planned embarkation and/or disembarkation of passengers or for onloading and offloading cargo.

- (c) After having landed at an en-route diversion location, the operator may resume the flight that has already started at a vertiport, perform a ferry flight or remove the VCA from the diversion location by other means, as the case may be.
- (d) An en-route diversion location should not be understood as a vertiport used for diversion.

GM2 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

DIVERSION LOCATIONS — EXAMPLES

A diversion location may be a football stadium, a parking lot, a grass field or else, to be used only to divert from the planned route as necessary. A diversion location is not an aerodrome (vertiport) and a diversion location always has to be adequate according to point UAM.OP.MVCA.107.

GM3 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

ABNORMAL CONDITION OR SITUATION

AMC 25.1581 contains the following definition for ‘abnormal procedure’ in the context of AFM:

‘A procedure requiring flight crew action, due to failure of a system or component, to maintain an acceptable level of airworthiness for continued safe flight and landing.’

This definition is fully applicable to a CFP in the context of a VCA. In addition, in flight operations, other abnormal situations may arise, such as pilot incapacitation, ground proximity warning, windshear, etc., in which the flight crew should be using abnormal (i.e. non-normal) procedures to ensure that the safety of the aircraft or of persons on board or on the ground is not endangered.

AMC5 UAM.OP.MVCA.107 Adequate vertiport and adequate diversion location

DIVERSION LOCATIONS IN CROSS-BORDER OPERATIONS

- (a) For the purpose of using one or more adequate diversion locations in another State (in a cross-border operation), the VCA operator should ensure that the local requirements and information relevant to the intended diversion locations have been considered. Cross-border operations should be understood as operations in a State other than the State of the operator.
- (b) If satisfied that the intended diversion location(s) meets (meet) the applicable requirements, the operator should notify the competent authority of the State of the operator in accordance with point ORO.GEN.130.
- (c) When notified by the operator in accordance with point ORO.GEN.130(c) of the intended use of one or more diversion locations in a cross-border operation, the competent authority of the State of the operator should review the operator’s policy and procedures for the selection of adequate diversion locations and associated documentation in coordination with the

competent authority of the other State. Both competent authorities should be satisfied that the applicable requirements have been complied with before the operator starts the intended operations.

AMC6 UAM.OP.MVCA.107 Adequate vertiport or adequate diversion location

RESCUE AND FIREFIGHTING SERVICES (RFFS)

The VCA operator should:

- (a) as part of its safety management system, assess the level of RFFS protection available at the vertiport or diversion location intended to be used to confirm that it is acceptable for the intended operation; and
- (b) include information relevant to the RFFS protection that is deemed acceptable by the operator in the operations manual.

GM4 UAM.OP.MVCA.107 Adequate vertiport or adequate diversion location

RESCUE AND FIREFIGHTING SERVICES (RFFS) AND OTHER SERVICES AND FACILITIES

- (a) A vertiport or a diversion location is considered adequate if it is provided, among others, with RFFS. This means that either the vertiport or the diversion location is equipped for RFFS (e.g. equipped with fire extinguishers, fire hoses, fire and welding blankets, etc.) or an agreement is established with a local firefighting unit for the provision of RFFS or there is another appropriate arrangement for RFFS purposes.
- (b) Other services and facilities that may be necessary for the intended operations include but are not limited to air traffic services, lighting, communications, weather reporting, navigation aids, charging equipment and sound protection.

AMC1 UAM.OP.MVCA.111 Visibility and distance from cloud minima — VFR flights

GENERAL

- (a) When establishing visibility and distance from cloud minima, the operator should take the following into account:
 - (1) the meteorological conditions appropriate to the intended flight;
 - (2) the condition of the take-off and landing area;
 - (3) the location and height of all obstacles that could hinder take-off or landing;
 - (4) the VCA performance and capability related to obstacle clearance, take-off and landing, and any flight restrictions;
 - (5) ATC communications, if required;

- (6) ATC instructions and clearances in controlled airspace, if applicable; and
 - (7) the availability of ground infrastructure and equipment required for take-off, landing and taxiing or ground movement.
- (b) If there is a specific need to see and avoid obstacles and/or other VCA on take-off, additional conditions (e.g. ceiling) should be specified.

AMC1 UAM.OP.MVCA.155 Carriage of special categories of passengers (SCPs)

GENERAL

Persons requiring special conditions, assistance and/or devices when carried on a flight should be considered SCPs, including at least:

- (a) persons with reduced mobility (PRMs) who, without prejudice to Regulation (EC) No 1107/2006¹⁰, are understood to be any person whose mobility is reduced due to any physical disability, sensory or locomotory, permanent or temporary, intellectual disability or impairment, any other cause of disability, or age;
- (b) infants and unaccompanied children; and
- (c) deportees, inadmissible passengers or prisoners in custody.

AMC2 UAM.OP.MVCA.155 Carriage of special categories of passengers (SCPs)

PROCEDURES OF THE VCA OPERATOR

- (a) The procedures of the VCA operator for the carriage of SCPs should be based on the assessment of the safety risks inherent to the carriage of SCPs during flight operations and should take into account whether:
 - (1) only some seats in the VCA permit direct access to an emergency exit; or
 - (2) each seat in the VCA permits direct access to an emergency exit.

In the first case, the operator's procedure should contain instructions that do not allow SCPs to be allocated to emergency exit seats or to occupy them.

In the second case, the operator's procedure should contain instructions on the allocation of emergency exit seats to SCPs or their occupation by SCPs, ensuring among other things that the flight crew is not impeded in carrying out their duties.
- (b) The operator's procedures should contain instructions with regard to the number of SCPs that may be carried on board simultaneously.

¹⁰ Regulation (EC) No 1107/2006 of the European Parliament and of the Council of 5 July 2006 concerning the rights of disabled persons and persons with reduced mobility when travelling by air (OJ L 204, 26.7.2006, p. 1) (<http://data.europa.eu/eli/reg/2006/1107/oj>)

GM1 UAM.OP.MVCA.155 Carriage of special categories of passengers (SCPs)

MEANING OF 'SEAT THAT PERMITS DIRECT ACCESS'

A passenger seat that permits direct access is the first seat inboard of the emergency exit.

AMC1 UAM.OP.MVCA.160 Stowage of baggage and cargo

STOWAGE PROCEDURES

The procedures established by the operator to ensure that baggage and cargo are adequately and securely stowed should take the following into account:

- (a) each item should be stowed only at a location that can restrain it;
- (b) weight limitations placarded on or adjacent to stowages should not be exceeded;
- (c) under seat stowage should not be used unless the seat is equipped with a restraint bar and the baggage is of such size that it may adequately be restrained by such equipment;
- (d) baggage and cargo should not be placed at locations where they could impede access to emergency equipment.

AMC2 UAM.OP.MVCA.160 Stowage of baggage and cargo

CARRIAGE OF CARGO IN THE PASSENGER COMPARTMENT

The following should be observed when carrying cargo in the passenger compartment of a VCA:

- (a) dangerous goods should not be allowed;
- (b) the mass of cargo should not exceed the structural loading limits of the floor or seats;
- (c) the number/type of restraint devices and their attachment points should be capable of restraining the cargo; and
- (d) the location of the cargo should be such that, in the event of an emergency evacuation, it will neither hinder egress nor impair the crew's view.

GM1 UAM.OP.MVCA.160 Stowage of baggage and cargo

THE TERM 'CARGO'

The term 'cargo' in point UAM.OP.MVCA.160(b) refers to anything that belongs to a passenger travelling but is not a piece of luggage (e.g. a musical instrument that may have to be restrained to the seat). Thus, point UAM.OP.MVCA.160(b) does not provide for the use of the cabin as cargo compartment.

AMC1 UAM.OP.MVCA.165 Passenger seating

PROCEDURES OF THE VCA OPERATOR

- (a) The operator's procedures regarding the allocation and occupation of seats giving direct access to an emergency exit should contain instructions that those seats be allocated in a non-discriminatory manner, consistent with the applicable requirements, to passengers who will be able to assist the flight crew and/or other passengers during evacuation.
- (b) Passengers who, due to their condition, might hinder other passengers during evacuation or who might impede the flight crew in carrying out their duties, should not be allocated seats that permit direct access to emergency exits. Those passengers may be allowed to occupy such seats on the condition that each of the seats in the VCA gives direct access to an emergency exit and the operator has assessed the operational safety risks, considering among others whether this may impede the flight crew in carrying out their duties.
- (c) The operator's procedures should identify the person(s) designated by the VCA operator to determine passenger seating next to emergency exits.

AMC1 UAM.OP.MVCA.170 Passenger briefing

PASSENGER BRIEFING AND SAFETY DEMONSTRATION

- (a) Passenger briefing and safety demonstration should contain instructions on the following items, as applicable for the intended operation:
 - (1) the use of safety belts or restraint systems, including instructions on how to fasten and unfasten them;
 - (2) the location of emergency exits;
 - (3) the location and use of oxygen equipment, if carried on board; passengers should also be briefed on how to extinguish all smoking materials (e.g. cigarettes, cigars, vapes, etc.) when oxygen is being used;
 - (4) the location and use of life jackets, if carried on board;
 - (5) the location and use of handheld fire extinguishers, if carried in the passenger compartment;
 - (6) emergency lighting and marking;
 - (7) any cabin secured aspects, e.g. required position of seatbacks, tray tables, footrests, window blinds, etc., as applicable;
 - (8) correct stowage of baggage and the importance of leaving baggage behind in case of evacuation;
 - (9) the use and stowage of portable electronic devices (PEDs), including in-flight entertainment (IFE) systems;
 - (10) non-smoking instructions;
 - (11) the radial component of the downwash around the VCA;

- (12) the use of life rafts and survival equipment, if carried on board.
- (b) Passengers occupying seats with direct access to emergency exits should receive additional briefing on the operation and use of the emergency exit, assessment of the surrounding conditions for the safe use of the emergency exit, and recognition of emergency commands given by the crew.
- (c) In addition to points (a) and (b), passengers should be instructed during flight in case of emergency, as appropriate to the circumstances.

AMC2 UAM.OP.MVCA.170 Passenger briefing

PASSENGER BRIEFING AND SAFETY DEMONSTRATION

Briefing/demonstration referred to in AMC1 CAT.OP.MPA.170(a) should not be replaced by other means unless:

- (a) the operator has developed a passenger training programme covering all safety and emergency procedures for a given VCA type; and
- (b) only passengers who have been trained according to this programme and have flown on the VCA type within the last 90 days are carried on board without receiving briefing/demonstration.

AMC3 UAM.OP.MVCA.170 Passenger briefing

PASSENGER BRIEFING IN SINGLE-PILOT OPERATIONS

- (a) In single-pilot operations, passengers should be briefed:
- (1) by ground personnel designated by the operator; or
 - (2) by the PIC, except during the critical phases of flight.
- (b) In single-pilot operations, passengers may be briefed by means of audio instruction and/or safety video presentation either on ground or in the aircraft.

AMC4 UAM.OP.MVCA.170 Passenger briefing

IN-FLIGHT ENTERTAINMENT (IFE) SYSTEMS

When IFE systems are available by means of equipment that can be handled by passengers, including PEDs provided by the operator for the purpose of IFE, appropriate information containing at least the following should be provided to passengers:

- (a) instructions on how to safely operate the IFE system for personal use in normal conditions;
- (b) restrictions, including stowage of retractable or loose items of equipment (e.g. screens or remote controls) during taxiing, take-off and landing, and in abnormal or emergency conditions.

GM1 UAM.OP.MVCA.170 Passenger briefing

SAFETY BRIEFING MATERIAL

Useful guidance on safety briefing material may be found in GM2 CAT.OP.MVCA.170.

AMC1 UAM.OP.MVCA.175 Flight preparation

OPERATIONAL FLIGHT PLAN

- (a) The operational flight plan used and the entries made during flight should contain the following items:
- (1) VCA registration;
 - (2) VCA type and variant;
 - (3) date of flight;
 - (4) flight identification;
 - (5) name(s) of the flight crew member(s);
 - (6) duty assignment of the flight crew member(s);
 - (7) place (vertiport) of departure;
 - (8) time of departure (actual off-block time, take-off time);
 - (9) place (vertiport) of arrival (planned and actual);
 - (10) time of arrival (actual landing and on-block time);
 - (11) type of operation (VFR day; commercial air transport operation, VEMS, non-commercial operation, training flight, etc.);
 - (12) route and route segments with checkpoints/waypoints, distances, time and tracks;
 - (13) planned cruising speed and flying times between checkpoints/waypoints (estimated, revised, and actual times overhead);
 - (14) minimum flight altitudes and minimum levels;
 - (15) planned altitudes and flight levels;
 - (16) fuel/energy calculations (records of in-flight fuel/energy checks);
 - (17) fuel/energy on board when powering on lift and thrust units;
 - (18) safe landing options at the point of commitment;
 - (19) vertiports or diversion locations along the route for the purpose of diversion;
 - (20) initial ATS flight plan clearance and subsequent reclearance, if applicable;
 - (21) in-flight replanning calculations; and
 - (22) meteorological information, as specified in point (a) of point MET.TR.215 of Part-MET.

- (b) Items that are readily available in other documentation or from another acceptable source or are irrelevant to the type of operation may be omitted in the operational flight plan.
- (c) The operational flight plan and its use should be described in the operations manual.
- (d) All entries in the operational flight plan should be made concurrently and be permanent in nature.

OPERATIONAL FLIGHT PLAN — VEMS AND LOCAL AREA OPERATIONS

- (e) For VEMS and local area operations with VCA, the operational flight plan may be established in a simplified form. Local area operations should be defined in the operations manual.
- (f) No entries should be required in the operational flight plan during the flight.

OPERATIONAL FLIGHT PLAN PRODUCED BY A COMPUTERISED FLIGHT-PLANNING SYSTEM

- (g) When the IAM operator uses a computerised flight-planning system to produce an operational flight plan, the functionality of this system should be described in the operations manual.
- (h) If the computerised flight-planning system is used in conjunction with energy level calculations and checks, the proper functionality of the software should be tested after each upgrade. The test should verify that the changes to the software do not affect the final output.

GM1 UAM.OP.MVCA.175 Flight preparation

CONVERSION TABLES

The documentation should include any conversion tables necessary to support operations where metric heights, altitudes and flight levels are used.

AMC1 UAM.OP.MVCA.177 Submission of an air traffic services (ATS) flight plan

FLIGHT WITHOUT AN ATS FLIGHT PLAN

- (a) When unable to submit or close the ATS flight plan, the operator should establish procedures, instructions, and a list of nominated persons to be responsible for alerting search and rescue (SAR) services.
- (b) To ensure that each flight is located at all times, these instructions should:
 - (1) provide the nominated person(s) with at least the information required to be included in a VFR flight plan, and the location, date, and estimated time for re-establishing communications;
 - (2) if a VCA is overdue or missing, ensure that the appropriate ATS or SAR service is notified; and
 - (3) ensure that the information will be retained at a designated location until the completion of the flight.

AMC1 UAM.OP.MVCA.192 Fuel/energy scheme — selection of vertiports and diversion locations

ACCESS TO INFORMATION

The IAM operator should ensure that the PIC has access to up-to-date information regarding vertiports and diversion locations, including their operational status and meteorological conditions.

AMC2 UAM.OP.MVCA.192 Fuel/energy scheme — selection of vertiports and diversion locations

POINT OF COMMITMENT

The point of commitment at the destination is a reference point that should be defined based on all the following:

- (a) the planned safe landing options can be reached from that point taking into account the CMP following a CFP;
- (b) after that point, landing at the committed landing site should be guaranteed;
- (c) the safe landing options should be weather-permissible, i.e. for the anticipated time of use, meteorological reports, or forecasts, or any combination of these, should indicate that the meteorological conditions will be at or above the VMC visibility and distance from cloud minima as specified in point SERA.5001 of Regulation (EU) No 923/2012 for the airspace class being flown, unless operating as a special VFR flight.

GM1 UAM.OP.MVCA.192 Fuel/energy scheme — selection of vertiports and diversion locations

POINT OF COMMITMENT

When the minimum number of planned safe landing options at the destination is two, they may include:

- (a) the destination vertiport and another vertiport; or
- (b) the destination vertiport and a diversion location; or
- (c) two separate runways/FATO/TLOF at the destination vertiport.

AMC3 UAM.OP.MVCA.192 Fuel/energy scheme — selection of vertiports and diversion locations

PLANNING MINIMA AND SAFETY MARGINS FOR THE DEPARTURE VERTIPORT

- (a) To allow for a safe landing in case of an abnormal or emergency situation after take-off, the appropriate meteorological information provided to the PIC should indicate that the actual and forecast meteorological conditions at the vertiport of departure are expected to remain at or above the visibility and distance from cloud minima as specified in point SERA.5001 of

Regulation (EU) No 923/2012 for the airspace class being flown, unless operating as a special VFR flight.

PLANNING MINIMA AND SAFETY MARGINS FOR THE DESTINATION VERTIPOINT OR ANOTHER SAFE LANDING OPTION AT THE DESTINATION VERTIPOINT

- (b) The PIC should ensure that the duration of the flight and the actual and forecast meteorological conditions, based on appropriate meteorological information, are such that during a period commencing either 1 hour before the estimated time of arrival or at the time of pre-flight planning, whichever is later, and ending 1 hour after the estimated time of arrival at the destination vertiport or at another planned safe landing option, an approach and landing are possible at or above visibility and distance from cloud minima as specified in point SERA.5001 of Regulation (EU) No 923/2012 for the airspace class being flown, unless operating as a special VFR flight.
- (c) As some of the meteorological information specified in point (e) of point MET.TR.215 of Part-MET is airfield-specific, the PIC should exercise caution when associating it with nearby vertiports or diversion locations.

PLANNING MINIMA FOR VERTIPOINTS AND DIVERSION LOCATIONS ALONG THE ROUTE

- (d) The planning minima, in terms of visibility and distance from cloud, for an approach and landing at vertiports or diversion locations along the route may be below those specified in point SERA.5001 of Regulation (EU) No 923/2012 for the airspace class being flown. In any case, the PIC should ensure that the VFR flight is conducted in conditions of visibility and distance from clouds equal to or greater than those specified in point SERA.5001 or point SERA.5005, unless operating as a special VFR flight.

GM2 UAM.OP.MVCA.192 Fuel/energy scheme — selection of vertiports and diversion locations

APPROPRIATE METEOROLOGICAL INFORMATION

Useful guidance material as regards appropriate meteorological information may be found in:

- GM1 CAT.OP.MPA.192(c);(d) on the use of aerodrome reports and forecasts;
- GM2 CAT.OP.MPA.192(c);(d) on supplemental meteorological information using digital imagery.

AMC1 UAM.OP.MVCA.193 Safe landing options at the destination

TRAFFIC AND OTHER OPERATIONAL CONDITIONS

- (a) The PIC should commit to land at one of the safe landing options:
- (1) following an energy system check and prediction indicating that the remaining energy is sufficient to perform a safe landing at the committed landing option; and
 - (2) after checking that the landing option is available.

- (b) If the safe landing options are co-located at the destination vertiport, the PIC should ensure that no other aircraft is taking off or landing at any of them at the same time when the landing of the VCA is expected, unless the landing options are independent and operation at one of them does not affect safe landing at the other one.

GM1 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA

SCOPE

The requirements on special refuelling or defuelling of VCA apply to VCA using conventional fuel.

GM2 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA

RISK ASSESSMENT

- (a) The risk assessment, required by point UAM.OP.MVCA.200(a)(1), is intended to explain why special refuelling/defuelling is needed, identify any additional hazards, and describe how the additional risks are controlled.
- (b) The operators' risk assessment may include but may not be limited to the following risks, hazards and mitigation measures:
- (1) risk related to refuelling with lift and thrust units powered on;
 - (2) risk related to the shutting down of the lift and thrust units, including the risk of failures during start-up;
 - (3) environmental conditions, such as wind limitations, displacement of exhaust gases, and blade sailing;
 - (4) risk related to human factors and fatigue management, especially for single-pilot operations for long periods of time;
 - (5) risk mitigation, such as the safety features of the fuel installation, rescue and firefighting (RFF) capability, number of personnel available, ease of emergency evacuation of the VCA, etc.;
 - (6) assessment of the use of radio-transmitting equipment;
 - (7) determination of the use of passenger seat belts;
 - (8) assessment of the use of PED(s);
 - (9) if passengers are to disembark, consider passenger disembarkation before refuelling rather than after; and
 - (10) if passengers are to embark, consider passenger embarkation after refuelling rather than before.

AMC1 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA**REFUELLING WHEN LIFT AND THRUST UNITS ARE POWERED ON**

- (a) Refuelling when lift and thrust units are powered on should only be conducted:
- (1) with no passengers embarking or disembarking; however, passengers may be on board;
 - (2) if allowed by the operator of vertiport or diversion location, as applicable;
 - (3) in accordance with any specific procedures and limitations in the AFM;
 - (4) using JET A or JET A-1 fuel types; and
 - (5) with the appropriate RFFS facilities or equipment available.
- (b) In addition, operational procedures in the operations manual should specify that at least the following precautions are taken:
- (1) all necessary information should be exchanged in advance with the vertiport or diversion location operator, and with the refuelling operator;
 - (2) the procedures to be used by crew members should be defined;
 - (3) the procedures to be used by the operator's ground operations personnel that are in charge of refuelling or assisting in emergency evacuation should be described;
 - (4) the operator's training programmes for crew members and for the operator's ground operations personnel should be described;
 - (5) the minimum distance between the VCA turning parts and the refuelling vehicle or installations should be defined when the refuelling takes place outside a vertiport;
 - (6) a handheld fire extinguisher with the equivalent of 5 kg of dry powder should be immediately available and ready for use;
 - (7) a means for a two-way communication between the crew and the person in charge of refuelling should be defined and established;
 - (8) if fuel vapour is detected inside the VCA, or any other hazard arises, refuelling/defuelling should be stopped immediately;
 - (9) the PIC should stay at the controls, constantly monitor the refuelling process, and be ready to shut off the lift and thrust units and evacuate at all times; and
 - (10) any additional precautions should be taken, as determined by the operator's risk assessment.

AMC2 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA**REFUELLING WHEN LIFT AND THRUST UNITS ARE POWERED ON WITH PASSENGERS ON BOARD**

In addition to AMC1 UAM.OP.MVCA.200, for refuelling with passengers on board, the operational procedures in the operations manual should specify that at least the following precautions are taken:

- (a) the positioning of the VCA and the corresponding evacuation strategy should be defined taking into account the wind as well as the refuelling facilities or vehicles;
- (b) on a vertiport or diversion location, the ground area beneath the exits that are intended for emergency evacuation should be kept clear;
- (c) additional passenger briefing as well as instructions should be defined, and the 'NO SMOKING' signs should be on unless 'NO SMOKING' placards are installed;
- (d) interior lighting should be set to enable the identification of emergency exits;
- (e) the use of doors during refuelling should be defined: doors on the refuelling side should remain closed, while doors on the opposite side should remain unlocked or, weather permitting, open, unless otherwise specified in the AFM;
- (f) at least one suitable person capable of implementing emergency procedures for firefighting, communications, as well as for initiating and directing an evacuation, should remain at a specified location; this person should not be the qualified pilot at the controls or the person performing the refuelling; and
- (g) unless passengers are regularly trained in emergency evacuation procedures, an additional crew member or ground crew member should be assigned to assist passengers to rapidly evacuate the VCA.

AMC3 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA

REFUELLING OR DEFUELLING WITH PASSENGERS EMBARKING, ON BOARD OR DISEMBARKING

- (a) The VCA should not be refuelled/defuelled with Avgas (aviation gasoline) or wide-cut type fuel or a mixture of these types of fuel when passengers are embarking, on board, or disembarking.
- (b) For all other types of fuel, the necessary precautions should be taken and qualified personnel should be ready to initiate and direct passenger evacuation from the VCA by using the most practical and expeditious means available.

AMC4 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA

REFUELLING WITH PASSENGERS DISEMBARKING OR EMBARKING WHEN THE LIFT AND THRUST UNITS ARE POWERED OFF

- (a) When the lift and thrust units are powered off, the efficiency and speed of passengers disembarking from and re-embarking the VCA should be such that disembarking before refuelling and re-embarking after refuelling is the general practice, except for VEMS.
- (b) VEMS operators should refer to Part-SPA Subpart O.

AMC5 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA**REFUELLING OR DEFUELLING WITH WIDE-CUT FUEL**

Refuelling/defuelling with wide-cut fuel should be conducted only if the operator has established appropriate procedures, taking into account the high risk of using wide-cut fuel types.

GM3 UAM.OP.MVCA.200 Special refuelling or defuelling of VCA**PROCEDURES FOR REFUELLING/DEFUELLING WITH WIDE-CUT FUEL**

The IAM operator should refer to GM3 CAT.OP.MPA.200, if applicable.

AMC1 UAM.OP.MVCA.205 Charging or swapping of VCA batteries while passengers embark, are on board, or disembark**RISK ASSESSMENT AND NECESSARY PRECAUTIONS**

- (a) The operator should assess as a minimum the following hazards, risks and mitigation measures related to charging or swapping of batteries while passengers are embarking, on board or disembarking, as applicable:
 - (1) fires;
 - (2) battery overcharging;
 - (3) battery short circuit;
 - (4) stability of electrical currents when charging batteries;
 - (5) ambient conditions under which battery charging will take place;
 - (6) available mitigation means, such as the safety features of the charging installation, RFF capability, fire extinguishers that are specifically designed to combat a battery fire, available personnel, ease of emergency VCA evacuation, etc.
- (b) The operator should take the necessary precautions to avoid or mitigate the risks of overcharging, overheating, short circuit and fire when charging or swapping batteries with passengers embarking, on board, or disembarking.
- (c) Qualified personnel should be ready to initiate and direct passenger evacuation from the VCA by using the most practical and expeditious means available, where necessary.

GM1 UAM.OP.MVCA.205 Charging or swapping of VCA batteries while passengers embark, are on board, or disembark

- (a) Charging or swapping of batteries — potential risks

Battery overcharging may lead to heat generation and in some cases, to a so-called thermal runaway. In the case of batteries based on lithium ion technology, overcharging can lead to the cell opening and possibly to fire and explosion.

Battery short circuit is a serious safety hazard that can be prevented with proper precautions. A short circuit may occur when the battery gets in touch with some metallic parts or when it is not properly installed. As a result, a large current flows through the short circuit, creating heat and possibly causing the battery to leak or explode.

Unstable electrical currents when charging lithium ion batteries may lead to their cells becoming unstable and causing a fire.

(b) Charging or swapping of batteries — recommended precautions

During VCA certification, manufacturers are responsible to demonstrate fire protection and containment of the thermal runaway within the propulsion batteries based on, e.g., MOC VTOL.2325 Fire Protection, MOC VTOL.2330 Fire Protection in designated fire zones, and MOC VTOL.2440 Lift/thrust system installation fire protection of SC-VTOL.

In addition, the following precautions may be taken by the operator as necessary:

- training of the staff member or the contractor, who is tasked with charging or swapping batteries to understand and minimise the associated risks;
- provision of information to the staff member or the contractor regarding the maximum ambient temperatures at which charging may take place and the acceptable ambient conditions and voltage/ power ranges in order to avoid overcharging;
- to avoid overheating, batteries should not be exposed to or charged in direct sunlight or near any type of hot work (e.g. welding), heated surface, open flame or ignition source;
- the environment in which batteries are being charged should be free from extreme humidity, as any moisture in the air or the environment can also affect the stability of the battery;
- avoiding high charge and discharge currents when lithium ion batteries are being charged; and
- as battery fire can burn quickly and fiercely, using fire extinguishers that are specifically designed to contain a battery fire at the place of charging or swapping batteries to at least extend the time for passengers to evacuate the VCA.

GM2 UAM.OP.MVCA.205 Charging or swapping of VCA batteries while passengers embark, are on board, or disembark

CHARGING OF BATTERIES — ELECTROMAGNETIC EXPOSURE

Electromagnetic exposure during charging of battery packs mounted on VCA may, in certain situations, have a negative impact on people with pacemakers, implantable defibrillators or other implanted devices. Passengers known to bear such devices may be advised by the staff member or the contractor, who is tasked by the operator with charging or swapping batteries to keep distance from the charging cable or the charger.

AMC2 UAM.OP.MVCA.205 Charging or swapping of VCA batteries while passengers embark, are on board, or disembark

SWAPPING OF BATTERIES

The removal of a battery from a VCA and/or the installation of a battery on a VCA (swapping of batteries), regardless of whether passengers are embarking, on board, or disembarking, should be certified by a person authorised as ‘certifying staff’ in accordance with Regulation (EU) No 1321/2014.

GM1 UAM.OP.MVCA.295 Use of airborne collision avoidance system (ACAS)

OPERATIONAL PROCEDURES AND TRAINING PROGRAMMES

When ACAS is installed and serviceable, useful guidance material as regards the operational procedures and training programmes established by the operator may be found in GM1 CAT.OP.MPA.295.

AMC1 UAM.POL.VCA.100 Type of operation

VCA TYPE CERTIFICATION FOR IAM OPERATIONS

The VCA should be type-certified in accordance with the requirements of SC-VTOL Category ‘Enhanced’ or with any other equivalent certification basis. The equivalency is determined by EASA.

GM1 UAM.POL.VCA.100 Type of operation

SPECIAL CONDITION FOR SMALL-CATEGORY VTOL-CAPABLE AIRCRAFT (SC-VTOL)

VCA type certification according to SC-VTOL Category ‘Enhanced’ is required for commercial and non-commercial operations over congested areas.

Type certification under SC-VTOL applies to a small VCA with a maximum operational passenger seating configuration (MOPSC) of 9 or less and a maximum certified take-off mass of 5 700 kg or less.

AMC1 UAM.POL.VCA.105 VTOL-capable aircraft (VCA) performance data

PERFORMANCE DATA

Performance data that allows achieving compliance with the performance requirements of Annex IX (Part-IAM) should be included in the AFM. If performance data, as required for VCA operations, is not available in the AFM, then other data that allows achieving compliance with the performance requirements of Annex IX (Part-IAM) should be included in the OM-B.

AMC1 UAM.POL.VCA.110 General performance requirements

CORRECTION FOR WIND

The PIC should apply the correction required in accordance with point UAM.POL.VCA.110(c) on the reported wind component and use the resulting value for correcting other performance parameters (e.g. TODRV, LDRV) as specified in the AFM.

GM1 UAM.POL.VCA.110 General performance requirements

DENSITY ALTITUDE

Point (c)(3)(i) of point UAM.POL.VCA.110 refers to the pre-flight performance calculation of density altitude, essentially but not only for take-off and landing, using reported pressure altitude and temperature.

For in-flight replanning, if necessary, the pressure altitude and temperature at the destination as reported would be used, not the altitude read by the sensors. Therefore, neither the pressure altitude nor the GNSS altitude available in flight will ever be used for the purpose of point (c)(3)(i) of point UAM.POL.VCA.110.

GM2 UAM.POL.VCA.110 General performance requirements

REPORTED HEADWIND COMPONENT

The reported headwind component is the one reported at the time of flight planning. It may be used provided that there is no significant change of unfactored wind prior to take-off.

GM1 UAM.POL.VCA.115 Obstacle accountability

DIMENSION 'D'

The diameter 'D' is defined in point (6) of MOC VTOL.2115 Take-off performance. It should be published in metres and feet, rounded up to the next tenth. If the VCA changes its dimensions during taxi or parking (e.g. folding wings), the corresponding D_{taxi} and D_{parking} should also be provided.

GM2 UAM.POL.VCA.115 Obstacle accountability

DISTANCE 'DR'

For the purpose of obstacle accountability in the take-off flight path or the missed approach flight path, 'DR' is the horizontal distance that the VCA has travelled from the end of the TODA or when a backup take-off procedure is being used, from the back of the FATO.

AMC1 UAM.POL.VCA.120 Take-off

TAKE-OFF PROCEDURE

- (a) The procedure used for take-off should be compatible with the certified performance for take-off obtained during the type certification of the VCA.

- (b) The certified take-off performance of a VCA should allow for conventional take-offs (ConvTO) and/or vertical take-offs (VTO) and/or elevated conventional take-offs (eConvTO), as described in MOC VTOL.2115 Take-off performance (see Figure 1 below).

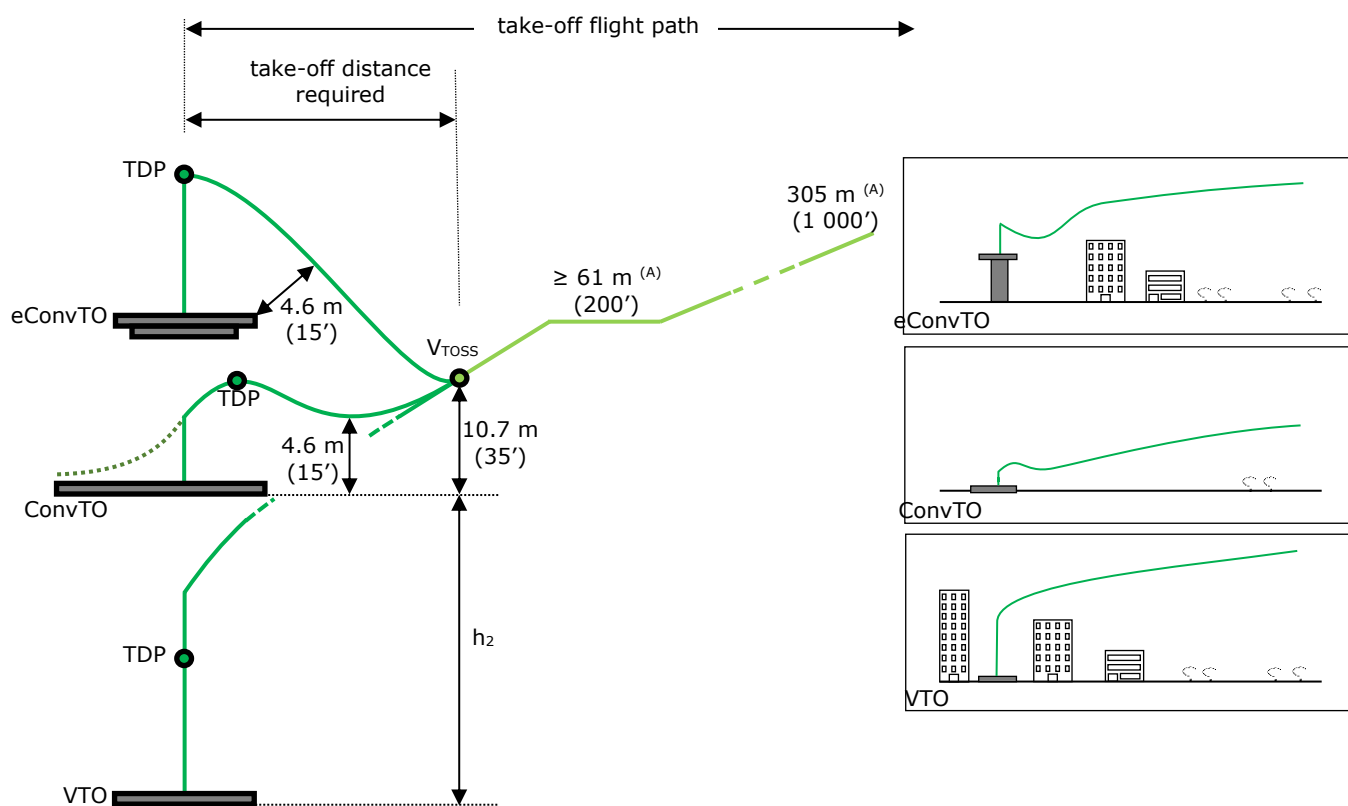


Figure 1: Possible take-off paths

GM1 UAM.POL.VCA.120 Take-off

TAKE-OFF PROCEDURES

- (a) The take-off procedures define take-off profiles and scheduled data for various environmental conditions and masses. Associated with such profiles and conditions are the minimum operating surfaces, take-off distances and climb performance distances; these are provided (usually in graphic form) with the take-off mass and the take-off decision point (TDP).
- (b) The minimum dimensions of the take-off surface should be compatible with the chosen take-off procedure. For example, for a vertical take-off (VTO) procedure, the minimum FATO dimensions should be 1.5 D, while for a forward take-off procedure, the minimum FATO dimensions should be the length of the rejected take-off distance required (RTODRV).
- (c) The landing surface and the height of the TDP are directly related to the ability of the VCA to reject the take-off and land on the surface, following a CFP event before or at TDP.

Following a CFP event at or after the TDP, a CMP should exist to perform a continued take-off (CTO) which provides obstacle clearance and distance to reach a point from where climb performance in the first and subsequent segments is assured.

The operator should be aware that if the TDP is lower than the top of the vertical segment, it is possible that the rejected take-off (RTO) cannot be performed safely from a given height upwards while meeting the CMP following a CFP. If the RTO is not a foreseen option, then the TDP may be set at the bottom of the vertical segment.

Where the TDP is shifted upwards, it will not affect the shape of the continued take-off profile but will shift the min-dip upwards by the same amount that the revised TDP has been increased — with respect to the basic TDP.

Such assertions are concerned only with the vertical or the backup procedures and can be regarded as achievable under the following circumstances:

- when the take-off procedure is flown, it is based upon a profile contained in the AFM — with the exception of the necessity to perform an RTO;
- the TDP, if shifted upwards (or upwards and backward in the backup procedure), will be the height at which performance is available to perform CTO following a CFP; and
- if obstacles are permitted in the backup area, they should continue to be permitted with a revised TDP.

AMC2 UAM.POL.VCA.120 Take-off

APPLICATION OF TODRV

The selected height at which safe obstacle clearance and a positive climb gradient are achieved, following a CFP recognised before or at the TDP, should be determined with the use of AFM data, and be at least 10.7 m (35 ft) above:

- (a) the take-off surface; or
- (b) as an alternative, a level height defined by the highest obstacle in the TODRV.

GM2 UAM.POL.VCA.120 Take-off

APPLICATION OF TODRV

The TODRV provides safe obstacle clearance following a CFP being recognised at TDP. It is the projected horizontal distance from the start of a take-off procedure to:

- (a) the point where the VCA reaches 10,7 m (35 ft) above the take-off surface with the minimum climb gradient of 4.5 %, for a conventional take-off (ConvTO);
- (b) the point where, after the dropdown segment, the VCA reaches 10,7 m (35 ft) above the take-off surface with the minimum climb gradient of 4.5 %, for an elevated conventional take-off (eConvTO);

- (c) the point where the VCA reaches 10,7 m (35 ft) above the high hover height (h₂) established in the AFM with the minimum climb gradient of 4.5 %, for a vertical take-off (VTO).

AMC3 UAM.POL.VCA.120 Take-off

OBSTACLE CLEARANCE IN THE BACKUP AREA

- (a) For ConvTO and eConvTO using a backup or a lateral transition procedure in accordance with point UAM.POL.VCA.120(d), the PIC should take into account the following factors:
- (1) in the backup: the PIC has few visual cues and should rely upon the altimeter and sight picture through the front or floor window (if flight path guidance is not provided) to achieve an accurate rearward flight path;
 - (2) in the rejected take-off (RTO): the PIC should be able to manage the descent against a varying forward speed whilst still ensuring adequate clearance from obstacles until the VCA gets in close proximity for landing on the FATO;
 - (3) in the continued take-off (CTO): the PIC should be able to accelerate to V_{TOSS} whilst ensuring adequate clearance from obstacles.
- (b) Point UAM.POL.VCA.120(d) may be complied with by establishing that:
- (1) in the backup area no obstacles are located within the safety zone below the rearward flight path when described in the AFM (see Figure 2); in the absence of such data in the AFM, the operator should contact the manufacturer in order to define a safety zone; or
 - (2) during the backup, the RTO and the CTO manoeuvres, as well as obstacle clearance, are demonstrated to the competent authority.

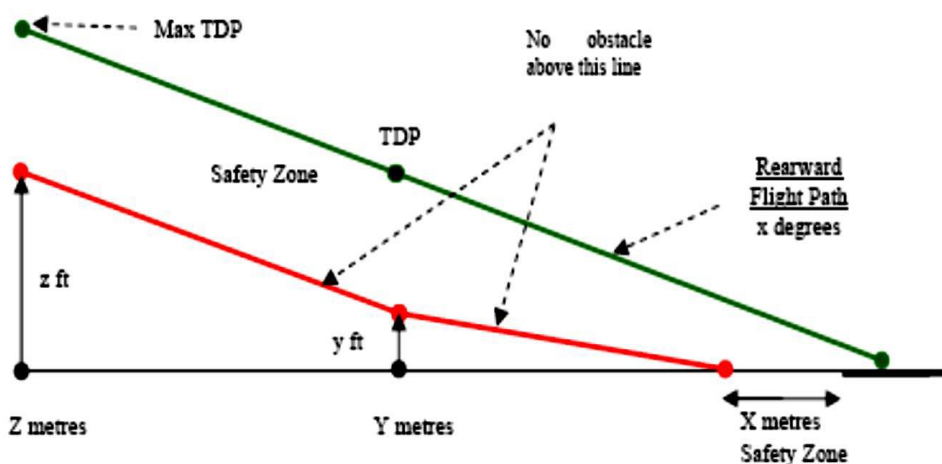


Figure 2: Rearward flight path

- (c) An obstacle in the backup area is considered if its lateral distance from the nearest point on the surface below the intended flight path is not farther than:

- (1) $0.75 \times D$; plus
- (2) $0.25 \times D$ or 3 m, whichever is greater; plus
- (3) $0.10 \times DR$ for VFR day; DR is in this case the distance travelled from the back of the FATO (see Figure 3).

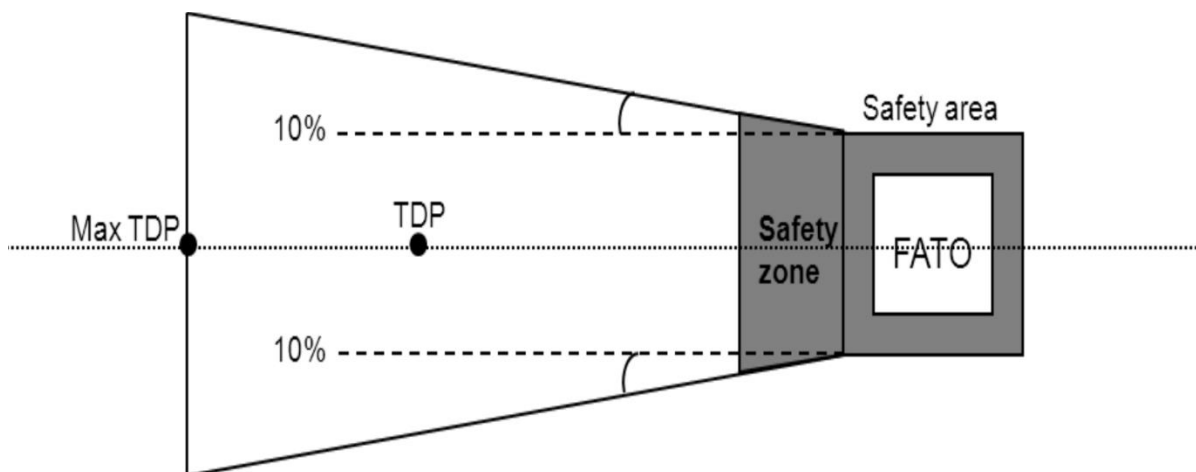


Figure 3: Obstacle accountability

GM1 UAM.POL.VCA.125 Take-off flight path

END OF THE TAKE-OFF FLIGHT PATH

The take-off flight path ends at 1 000 ft above the highest accounted obstacle in the take-off flight path in congested areas or whenever the VCA reaches the minimum flight altitude/height as established in accordance with Regulation (EU) No 923/2012.

AMC1 UAM.POL.VCA.135 Landing

LANDING PROCEDURE

The procedure used for landing should be compatible with the certified performance for landing obtained during the type certification of the VCA (ref.: MOC VTOL.2130 Landing).

GM1 UAM.POL.VCA.135 Landing

LANDING PROCEDURE

- (a) The certified landing performance of a VCA may allow for a conventional landing (ConvL) procedure or a vertical landing (VL) procedure.

The ConvL path starts at the landing decision point (LDP) and ends at the point where the aircraft reaches a stop at the FATO on the ground (after which it may taxi).

The VL path might be required when landing at a vertiport in a congested environment. The operator may choose to have, from a point along the approach after the LDP, a pure vertical trajectory.

- (b) In certain cases, in addition to ConvL or VL, the certified performance of a VCA may allow for ConvL with a roll-on.

GM2 UAM.POL.VCA.135 Landing

START OF THE LANDING FLIGHT PATH

The landing flight path starts at 1 000 ft above the highest obstacle in congested areas or at the minimum flight altitude/height as established in accordance with Regulation (EU) No 923/2012.

GM3 UAM.POL.VCA.135 Landing

LANDING DECISION POINT (LDP)

The LDP is identified with a combination of height, vertical speed and airspeed and/or ground speed.

- (a) The LDP is defined as the last point from which a balked landing can be performed. After LDP, a balked landing is not assured.
- (b) Following a CFP before or after the LDP, a VCA certified in the Category ‘Enhanced’ is deemed capable of a CFSL.

LANDING DISTANCE REQUIRED FOR VCA (LDRV)

- (c) The LDRV is the horizontal distance required to land and come to a stop from a point 15 m (50 ft) above the landing surface (Figure 4).

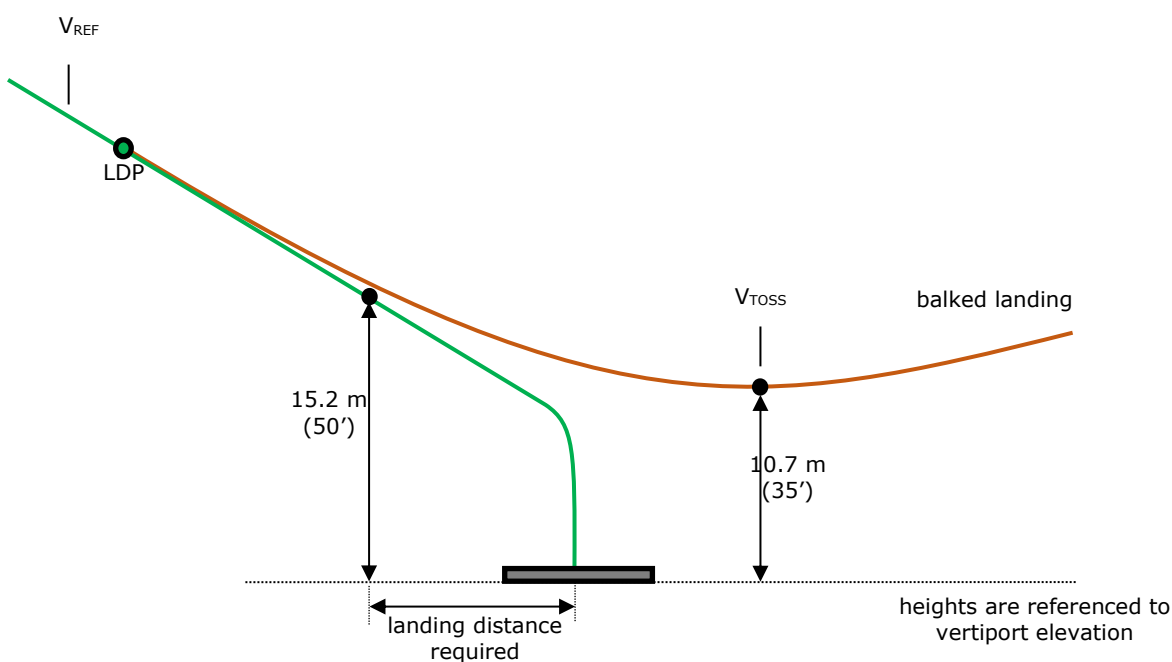


Figure 4: Landing path

AMC1 UAM.POL.VCA.140 Mass and balance, loading

CENTRE OF GRAVITY (CG) LIMITS — OPERATIONAL CG ENVELOPE AND IN-FLIGHT CG

- (a) Forward and aft CG limits are specified in the AFM. These limits allow for a proper trim setting for take-off and ensure that the certification stability and control criteria are met throughout the whole flight.
- (b) The IAM operator should ensure that these limits are respected by:
 - (1) defining and applying operational margins to the certified CG envelope in order to compensate for the following deviations and errors:
 - (i) deviations of the actual CG at empty or operating mass from published values due, for example, to weighing errors, unaccounted modifications and/or equipment variations;
 - (ii) deviations in the distribution of baggage and cargo in the various compartments as compared with the assumed load distribution as well as inaccuracies in the actual mass of baggage and cargo;
 - (iii) deviations in the actual passenger seating from the seating distribution assumed when preparing the mass and balance documentation. Large CG errors may occur when ‘free seating’, i.e. freedom of passengers to select any seat when entering the VCA, is permitted;
 - (iv) deviations of the actual CG of cargo and passenger load within individual cargo compartments or cabin sections from the normally assumed mid position;
 - (v) deviations of the CG caused by any configuration change, unless already covered by the certified limits;
 - (vi) deviations caused by in-flight change of loading;
 - (vii) deviations caused by the difference between the actual passenger masses and standard passenger masses when such masses are used; and
 - (2) defining and applying operational procedures in order to:
 - (i) ensure even distribution of passengers in the cabin;
 - (ii) take into account any significant CG travel during flight caused by passenger/crew movement; and
 - (ii) take into account any significant CG travel during flight caused by fuel consumption, if applicable.

AMC2 UAM.POL.VCA.140 Mass and balance, loading**WEIGHING OF A VCA**

- (a) New VCA that have been weighed at the factory may be operated without reweighing if the mass and balance records have been adjusted for alterations or modifications to the VCA. VCA transferred from one EU operator to another EU operator do not have to be weighed prior to use by the receiving operator unless more than 4 years have elapsed since the VCA was last weighed.
- (b) The mass and CG position of a VCA should be revised whenever the cumulative changes to the dry operating mass or CG exceed $\pm 0.5\%$ of the maximum landing mass or CG envelope respectively. This may be done by weighing the VCA or by calculation.
- (c) When weighing a VCA, normal precautions should be taken consistent with good practices such as:
- (1) checking for completeness of the VCA and equipment;
 - (2) determining that fluids are properly accounted for;
 - (3) ensuring that the VCA is clean; and
 - (4) ensuring that weighing is accomplished in an enclosed building.
- (d) Any equipment used for weighing should be properly calibrated, zeroed, and used in accordance with the manufacturer's instructions. Each scale should be calibrated either by the manufacturer, by a civil department of weights and measures or by an appropriately authorised organisation within 2 years or within a time period defined by the manufacturer of the weighing equipment, whichever is less. The equipment should enable the mass of the VCA to be established accurately. A single accuracy criterion for weighing equipment cannot be given. However, the weighing accuracy is considered satisfactory if the accuracy criteria in Table 1 are met by the individual scales/cells of the weighing equipment used.

Table 1: Accuracy criteria for weighing equipment

For a scale/cell load	An accuracy of below
2 000 kg	$\pm 1\%$
from 2 000 kg to 20 000 kg	± 20 kg
above 20 000 kg	$\pm 0.1\%$

AMC3 UAM.POL.VCA.140 Mass and balance, loading**DRY OPERATING MASS OF THE VCA**

The dry operating mass includes:

- (a) the pilot(s), technical crew member(s) and their baggage, as applicable;
- (b) catering and removable passenger service equipment, if applicable.

AMC4 UAM.POL.VCA.140 Mass and balance, loading

MASS VALUES FOR THE PILOT(S) AND TECHNICAL CREW MEMBER(S), IF APPLICABLE

- (a) The operator should use the following mass values for the pilot(s) and technical crew member(s), as applicable, to determine the dry operating mass:
 - (1) actual weighed masses including baggage; or
 - (2) standard masses, including baggage, of 85 kg.
- (b) The operator should correct the dry operating mass to account for any additional baggage. The position of any additional baggage should be accounted for when establishing the CG of the VCA.

AMC5 UAM.POL.VCA.140 Mass and balance, loading

MASS VALUES FOR PASSENGERS, THEIR CLOTHING AND PERSONAL BELONGINGS AND FOR BAGGAGE

- (a) When the actual number of passenger seats in the VCA is less than 6, passenger mass may be calculated on the basis of a statement made by, or on behalf of, each passenger plus a predetermined mass to account for clothing and personal belongings.

The predetermined mass for clothing and personal belongings should be established by the operator on the basis of studies relevant to its particular operation. In any case, it should not be less than 4 kg for clothing and personal belongings such as an overcoat, an umbrella, a small handbag or purse, reading material or a small camera or laptop.

The passengers' stated mass and the mass of passengers' clothing and personal belongings should be checked prior to boarding and, if necessary, adjusted. The operator should establish a procedure in the operations manual on when to select actual or standard masses and the procedure to be followed when determining mass based on verbal statements.
- (b) When determining the actual mass by weighing, the passengers' mass and the mass of passengers' clothing and personal belongings should be weighed immediately prior to boarding the VCA.
- (c) When using standard mass values, the standard mass values in Table 2 below should be used. The standard masses include the mass of any infant carried by an adult on one passenger seat. Infants occupying separate passenger seats should be considered 'children' for the purpose of this AMC.

Table 2: Standard masses for passengers — VCA with a total number of passenger seats of 19 or less

Passenger seats:	1–5	6–9	10–19
Male	104 kg	96 kg	92 kg
Female	86 kg	78 kg	74 kg
Children	35 kg	35 kg	35 kg

- (1) As baggage is weighed separately, 6 kg may be deducted from male and female masses in Table 2.
 - (2) For operations where a survival suit is provided to passengers, 3 kg should be added to the passenger mass value.
- (d) Mass values for baggage
- For VCA with 19 passenger seats or less, the actual mass of any passenger baggage carried in the VCA should be determined by weighing.
- (e) Other standard masses may be used provided that they are calculated on the basis of a detailed weighing survey plan and that a reliable statistical analysis method is applied. The operator should advise the competent authority about the intent of the passenger weighing survey and explain the survey plan in general terms. The revised standard mass values should only be used in circumstances comparable with those under which the survey was conducted. If the revised standard masses exceed those in Table 2, then such higher values should be used.
- (f) On any flight identified as carrying passengers whose mass, including clothing and personal belongings, are expected to significantly deviate from the standard passenger mass, the operator should determine the actual mass of such passengers by weighing or by adding an adequate mass increment.

AMC6 UAM.POL.VCA.140 Mass and balance, loading

PROCEDURE FOR ESTABLISHING REVISED STANDARD MASS VALUES FOR PASSENGERS AND BAGGAGE

To establish revised standard mass values for passengers and baggage, the IAM operator should refer to the procedure described in AMC2 CAT.POL.MAB.100(e).

GM1 UAM.POL.VCA.140 Mass and balance, loading

STATISTICAL EVALUATION OF PASSENGER AND BAGGAGE DATA

The IAM operator may use the statistical method described in GM2 CAT.POL.MAB.100(e) to establish the mass of the traffic load.

GM2 UAM.POL.VCA.140 Mass and balance, loading

GUIDANCE ON PASSENGER WEIGHING SURVEYS

The IAM operator may use the guidance on passenger weighing surveys provided in GM3 CAT.POL.MAB.100(e).

AMC1 UAM.POL.VCA.145 Mass and balance data, documentation

CONTENT OF THE MASS AND BALANCE DOCUMENTATION

The mass and balance documentation should include guidance to the PIC whenever a non-standard method has been used for determining the mass of the load.

AMC2 UAM.POL.VCA.145 Mass and balance data, documentation

CENTRE OF GRAVITY (CG) POSITION

The CG position should be in the mass and balance documentation unless:

- (a) the load distribution is in accordance with a pre-calculated balance table; or
- (b) it can be shown that for the planned operations a correct balance can be ensured, whatever the real load is.

AMC3 UAM.POL.VCA.145 Mass and balance data, documentation

INTEGRITY OF THE MASS AND BALANCE DOCUMENTATION

The operator should verify the integrity of the mass and balance data and documentation generated by a computerised mass and balance system at intervals not exceeding 6 months. The operator should establish a system to check that amendments to its input data are incorporated properly in the system and that the system operates correctly on a continuous basis.

AMC4 UAM.POL.VCA.145 Mass and balance data, documentation

SIGNATURE OR EQUIVALENT

When a signature by hand is impracticable or it is desirable to arrange the equivalent verification by electronic means, the following conditions should be applied in order to render an electronic signature equivalent to a conventional handwritten signature:

- (a) electronic 'signing' by entering a personal identification number (PIN) code with the appropriate security level, etc.;
- (b) entering the PIN code generates a print-out of the individual's name and professional capacity on the relevant document(s) in such a way that it is evident to anyone that needs that information who has signed the document;
- (c) the computer system logs information to indicate when and where each PIN code has been entered;

- (d) the use of the PIN code is, from a legal and responsibility point of view, considered fully equivalent to a handwritten signature;
- (e) the requirements for record-keeping remain unchanged; and
- (f) all personnel concerned are made aware of the conditions associated with electronic signature and this is documented.

GM1 UAM.IDE.VCA.100 Instruments and equipment

INSTRUMENTS AND EQUIPMENT

Any installed instrument or item of equipment, as well as their installation, should comply with Commission Regulation (EU) No 748/2012.

GM2 UAM.IDE.VCA.100 Instruments and equipment

REQUIRED INSTRUMENTS AND EQUIPMENT THAT NEED NOT BE APPROVED

The functionality of the required instruments and equipment, listed in point UAM.IDE.VCA.100(a), that need not be approved in accordance with Commission Regulation (EU) No 748/2012, is checked against recognised industry standards appropriate to the intended purpose. The maintenance of these instruments and equipment is ensured by the IAM operator.

GM3 UAM.IDE.VCA.100 Instruments and equipment

NOT REQUIRED INSTRUMENTS AND EQUIPMENT

Examples of non-installed instruments and equipment, not required by this Regulation, but carried on a flight, may be the following:

- (a) portable EFBs;
- (b) PEDs carried by flight crew or cabin crew; and
- (c) non-installed passenger entertainment equipment.

AMC1 UAM.IDE.VCA.105 Minimum equipment for a flight

MANAGEMENT OF THE STATUS OF CERTAIN INSTRUMENTS, EQUIPMENT OR FUNCTIONS

- (a) The IAM operator should control and retain the status of the instruments, equipment or functions that are required for the intended operation and that are not controlled for the purpose of continuing airworthiness management.
- (b) The IAM operator should define responsibilities and procedures to retain and control the status of the instruments, equipment or functions that are required for the intended operation and that are not controlled for the purpose of continuing airworthiness management.

GM1 UAM.IDE.VCA.105 Minimum equipment for a flight

MANAGEMENT OF THE STATUS OF CERTAIN INSTRUMENTS, EQUIPMENT OR FUNCTIONS

Instruments, equipment or functions that are required for the intended operation and that are not controlled for the purpose of continuing airworthiness management, may be but are not limited to equipment related to navigation approvals as FM immunity or certain software versions.

AMC1 UAM.IDE.MVCA.115 Operating lights

ANTI-COLLISION LIGHTS

- (a) An anti-collision light system should be installed to attract attention to the VCA and provide sufficient visibility in a timely manner for other aircraft to avoid a collision, especially in congested areas. The system should consist of one or more approved anti-collision lights. Each anti-collision light should be either aviation red or aviation white.
- (b) If installed, red flashing anti-collision lights (rotating beacons) should not affect the vision of the pilot or detract from the visibility of the position lights. The red flashing lights should be turned on when the lift and thrust units are powered on prior to taxiing or movement of the VCA on the ground and should be turned off at the end of the flight.
- (c) If installed, white flashing anti-collision lights (strokes) should be so located that the pilot's vision is not impaired. The white flashing lights should be turned on prior to take-off and turned off immediately after landing.

GM1 UAM.IDE.MVCA.125 Flight instruments and associated equipment

TYPE-CERTIFICATION APPROVAL

The required flight instruments/equipment are those specified in the certified type design definition of the VCA for the intended operations.

AMC1 UAM.IDE.MVCA.140 Fuel/energy measuring and displaying equipment

EQUIPMENT REQUIREMENTS

- (a) The VCA should be equipped with means of:
 - (1) measuring the remaining usable amount of fuel/energy;
 - (2) providing a conservative estimate in flight of the amount of fuel/energy necessary to complete the remaining part of the flight based on the approved individual fuel/energy scheme of the operator;
 - (3) displaying to the PIC the comparison between points (1) and (2) updated at regular intervals, as well as upon request; and

- (4) warning the PIC when the amount of fuel/energy necessary to complete the flight estimated in point (2) is greater than the remaining usable fuel/energy measured in point (1).
- (b) The estimation in point (a)(2) should:
 - (1) be updated at intervals to allow the VCA to reach the destination following the actual flight routing with the onset of the warning in point (a)(4);
 - (2) take into account actual wind conditions, and updated weather information issued through dedicated service providers; and
 - (3) take into account any existing or possible failure or malfunction of the VCA system or any existing or possible abnormal flight condition.
- (c) The VCA should be equipped with an in-flight replanning function that indicates to the PIC the area where a diversion is possible and indicate vectors to a suitable diversion location.
- (d) As an alternative to points (a)(2), (a)(3), (a)(4), (b) and (c), the operator may implement a procedure in accordance with AMC1 UAM.OP.VCA.195.

AMC1 UAM.IDE.MVCA.145 Height-determination equipment

RADIO ALTIMETER

A radio altimeter capable of emitting an audio warning below a preset height and a visual warning at a height selectable by the PIC may be used to meet the safety objective of point UAM.IDE.MVCA.145.

GM1 UAM.IDE.MVCA.145 Height-determination equipment

TAWS

A VCA equipped with a TAWS is considered to meet the requirements of point UAM.IDE.MVCA.145.

AMC2 UAM.IDE.MVCA.145 Height-determination equipment

AUDIO AND VISUAL WARNING

- (a) The audio warning should be a voice warning. The voice warning alert should be distinguishable from other warnings and should contain a clear and concise voice message. The height at which the audio warning is triggered should be such as to provide adequate time for the PIC to take corrective action. The voice warning should be triggered only whilst descending through the preset datum height and be inhibited whilst ascending.
- (b) The visual warning should require minimal interpretation by the PIC for both an instantaneous impression of absolute height and the rate of change of height.

GM2 UAM.IDE.MVCA.145 Height-determination equipment

It is recommended that an audio warning be triggered at a height in the range of 100–160 ft. The datum should not be adjustable in flight. Once triggered, the audio warning message should sound within 0.5 seconds.

AMC1 UAM.IDE.MVCA.170 Crew interphone system

TYPE OF CREW INTERPHONE

The crew interphone system should not be of a handheld type.

AMC1 UAM.IDE.MVCA.180 Public address system (PAS)

PAS SPECIFICATION

When required, the PAS should:

- (a) operate independently of the crew interphone system except for handsets, headsets, microphones, selector switches and signalling devices;
- (b) following a total failure of its primary electrical system, provide reliable operation for a minimum of 10 minutes.

AMC1 UAM.IDE.MVCA.185 Cockpit voice recorder (CVR)

CVR OPERATIONAL PERFORMANCE REQUIREMENTS

The operational performance requirements for CVRs should be those laid down in EUROCAE Document 112B dated August 2023, or any later equivalent standard accepted by EASA.

AMC1 UAM.IDE.MVCA.190 Flight data recorder (FDR)

FDR OPERATIONAL PERFORMANCE REQUIREMENTS

- (a) The operational performance requirements for FDRs should be those laid down in EUROCAE Document 112B dated August 2023, or any later equivalent standard accepted by EASA.
- (b) The FDR should, with reference to a timescale, record the parameters established in Table 3 and Table 4, as applicable, and any parameters that have been established during the type certification of the VCA.

Table 3

FDR — VCA

No	Parameter
1	Time
2	Altitude

3	Latitude
4	Longitude
5	Indicated airspeed or calibrated airspeed
6	Ground speed
7	Outside air temperature (OAT)
8	Heading (magnetic or true)
9	Track
10	Vertical speed
11	Pitch attitude
12	Roll attitude
13	Longitudinal acceleration (body axis)
14	Normal acceleration
15	Lateral acceleration
16	Roll rate or roll acceleration
17	Pitch rate or pitch acceleration
18	Yaw rate or yaw acceleration
19	Electric engines:
19a	Rotation speed of each rotor or propeller (in rpm)
19b	Health status of each electric engine controller
19c	Temperature of each electric engine
19d	Temperature of each electric engine controller
19e	Measured electrical current for each electric engine
19f	For liquid-cooled electric engines: pressure and temperature of the cooling liquid
20	Flight controls:
20a	Pilot input positions on all axes and corresponding flight control

20b	Outputs (e.g. target rpm for each electric engine, flight surface positions, etc.)
21	Status of each flight control computer
22	Wings angle (if applicable)
23	Nacelles angle (if applicable)
24	Propeller pits (for every variable pitch propeller)
25	Air-ground status such as weight on wheels or equivalent parameter
26	Alerts (including master warning and master caution status)
27	Manual voice transmission keying (if voice communications are used)
28	Each battery used for propulsion and/or flight controls:
28a	Health status
28b	State of charge (SOC)
28c	Voltage
28d	Temperature
28e	Current flow
28f	State of power (SOP) (if available)
28g	Each battery used for propulsion and/or flight controls: calculated remaining flight time (if available)
29	Each electrical distribution unit (e.g. distribution units, converters) contributing to the propulsion and/or flight controls: health status
30	Status of the battery management system (if any)
31	Combustion engines:
31a	Fuel parameters
31b	Oil pressure and temperature
31c	Parameters required to determine propulsive thrust or power delivered
31d	Turbine rpm (if applicable)
31e	FADEC health status (if applicable)

31f	VCA inputs used by the FADEC (if applicable)
31g	Any electrical current generation
31h	Any other parameter subject to a limitation

Table 4

FDR — VCA for which the data source for the parameter is either used by the VCA systems or is available for use by the pilot to operate the VCA

No	Parameter
1	Active AFCS mode
2	Radio altitude or terrain elevation
3	Current navigation source
4	Vertical and lateral deviation with respect to the current active navigation path
5	DME 1 & 2 distances
6	Drift angle
7	Wind speed
8	Wind direction
9	Landing gear position
10	Ice: ice detection
11	Ice: status of de-icing or anti-icing system
12	Electric engine: vibration level
13	Traffic advisory or alerts (if applicable)
14	Obstacle and terrain alerts (if applicable)

AMC1 UAM.IDE.MVCA.191 Flight recorder

FLIGHT RECORDER OPERATIONAL PERFORMANCE REQUIREMENTS

- (a) The flight recorder should record the parameters established in point (b) or point (c) and any other parameters that have been established during the type certification of the VCA.

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- (b) If the flight recorder records flight data, it should record at least the following parameters:
- (1) relative time count;
 - (2) pitch attitude or pitch rate;
 - (3) roll attitude or roll rate;
 - (4) heading (magnetic or true) or yaw rate;
 - (5) latitude;
 - (6) longitude;
 - (7) positioning system: estimated error (if available);
 - (8) pressure altitude or altitude from a positioning system;
 - (9) time;
 - (10) ground speed;
 - (11) positioning system: track (if available);
 - (12) normal acceleration;
 - (13) longitudinal acceleration;
 - (14) lateral acceleration;
 - (15) remaining usable amount of fuel/energy; and
 - (16) amount of fuel/energy necessary to complete the remaining part of the flight, unless the alternative procedure described in AMC1 UAM.OP.VCA.191 is used.
- (c) If the flight recorder records images, it should capture views of the main instrument displays at the pilot station(s). The recorded image quality should allow reading the following indications during most of the flight, as applicable:
- (1) magnetic or true heading;
 - (2) time (if presented on the front instrument panel);
 - (3) pressure altitude;
 - (4) indicated airspeed;
 - (5) vertical speed;
 - (6) slip;
 - (7) OAT;
 - (8) attitude (if displayed);
 - (9) stabilised heading (if displayed);
 - (10) lift and thrust unit status;
 - (11) remaining usable amount of fuel/energy; and

- (12) amount of fuel/energy necessary to complete the remaining part of the flight, unless the alternative procedure described in AMC1 UAM.OP.VCA.191 is used.
- (d) If the flight recorder records a combination of images and flight data, each flight parameter listed in point (b) should be recorded as flight data or by means of images.
- (e) The parameters to be recorded as flight data should meet the performance specifications (range, sampling intervals, accuracy limits and resolution in read-out) as defined in the relevant tables of EUROCAE Document 112B 'Minimum Operational Performance Specification for Crash Protected Airborne Recorder Systems' or any later equivalent standard accepted by EASA, or EUROCAE Document ED-155 'Minimum Operational Performance Specification for Lightweight Flight Recording Systems', dated July 2009, or any later equivalent standard accepted by EASA.
- (f) The operational performance requirements for flight recorders should be those laid down in:
- (1) EUROCAE Document ED-155 or any later equivalent standard accepted by EASA for lightweight flight recorders; or
 - (2) in EUROCAE Document 112B or any later equivalent standard accepted by EASA for crash-protected flight recorders.

GM1 UAM.IDE.MVCA.191 Flight recorder

Useful guidance material about flight recorders may be found in:

- GM1 CAT.IDE.H.191 as regards additional useful information on lightweight flight recorders;
- GM2 CAT.IDE.H.191 as regards the installation of cameras;
- GM3 CAT.IDE.A.191 as regards recording accuracy of attitude rate parameters;
- GM1 CAT.IDE.A.191(e) as regards the function to modify image and audio recordings.

GM1 IAM.IDE.MVCA.200 Flight data and cockpit voice combination recorder

GENERAL

The flight data and cockpit voice combination recorder is a flight recorder which records:

- (a) all voice communications and the aural environment as required by point UAM.IDE.MVCA.185 regarding CVRs; and
- (b) all the parameters required by point UAM.IDE.MVCA.190 regarding FDRs, with the associated specifications detailed in point UAM.IDE.MVCA.190.

AMC1 UAM.IDE.MVCA.205 Seats, seat safety belts, restraint systems and child restraint devices (CRDs)

CHILD RESTRAINT DEVICES (CRDs)

CRDs should comply with AMC1 CAT.IDE.H.205.

GM1 UAM.IDE.MVCA.205 Seats, seat safety belts, restraint systems and child restraint devices (CRDs)

UPPER TORSO RESTRAINT SYSTEM

The upper torso restraint system and the seat belt may be used independently.

GM2 UAM.IDE.MVCA.205 Seats, seat safety belts, restraint systems and child restraint devices (CRDs)

FOUR-POINT UPPER TORSO RESTRAINT SYSTEM

A four-point upper torso restraint system may also be used on passenger seats.

AMC1 UAM.IDE.MVCA.210 'FASTEN SEAT BELT' and 'NO SMOKING' signs

PERMANENT SIGNS

If seat belts need to be fastened throughout the flight, a permanent sign is acceptable. Passengers should be instructed accordingly.

AMC1 UAM.IDE.MVCA.220 First-aid kits

CONTENT OF FIRST-AID KITS

- (a) First-aid kits should be equipped with appropriate and sufficient medication and tools.
- (b) The minimum content of a first-aid kit should comply with points (b)(1), (2) and (3) of AMC1 CAT.IDE.H.220. For local area operations with VCA and for VEMS, the minimum content may comply with such industry standards as approved by the competent authority.

GM1 UAM.IDE.MVCA.220 First-aid kits

CONTENT OF FIRST-AID KITS

Standard DIN 13164 is found acceptable by EASA for local area flight operations with helicopters. Standard DIN 13164 may be deemed acceptable by the competent authority for local area operations with VCA or for VEMS.

AMC1 UAM.IDE.MVCA.240 Supplemental oxygen — non-pressurised VCA

DETERMINATION OF AMOUNT OF OXYGEN

The amount of supplemental oxygen for sustenance for a particular operation should be determined on the basis of flight altitudes and flight duration, consistent with the operating procedures, including emergency procedures, established for each operation and the routes to be flown as specified in the operations manual.

AMC1 UAM.IDE.MVCA.250 Handheld fire extinguishers

QUANTITY, LOCATION, AVAILABILITY AND TYPES

- (a) The quantity and location of handheld fire extinguishers should be such as to provide adequate availability for use in each compartment accessible in flight, account being taken of the need to minimise the hazard of toxic gas concentrations.
- (b) Handheld fire extinguishers should be checked to make sure that:
 - (1) they are in place and secured;
 - (2) they are charged and pressurised; and
 - (3) their expiry date has not elapsed.
- (c) Unless a handheld fire extinguisher is clearly visible, its location should be indicated by a placard or sign. Appropriate symbols may also be used to complement placards or signs.
- (d) Handheld fire extinguishers should be suitable for the types of fire likely to occur in the compartment where they are intended to be used.
- (e) Dry chemical fire extinguishers should not be used in the flight crew compartment or in any passenger cabin which is not separated by a partition from the flight crew compartment, because of the adverse effect on vision during discharge and, if conductive, interference with electrical contacts by the chemical residues.
- (f) Passengers should be instructed on how to use the handheld fire extinguisher when necessary.

AMC1 UAM.IDE.MVCA.260 Marking of break-in points

MARKINGS — COLOUR AND CORNERS

- (a) The colour of the markings should be red or yellow and, if necessary, should be outlined in white to contrast with the background.
- (b) If the corner markings are more than 2 m apart, intermediate lines 9 cm × 3 cm should be inserted so that there is no more than 2 m between the adjacent markings.

AMC1 UAM.IDE.MVCA.275 Emergency lighting and marking

GENERAL

Compliance with point UAM.IDE.MVCA.275(a) of VCA operating in VFR by day may be achieved by:

- (a) a floor proximity emergency escape path marking system, such as photoluminescent strips on the floor or lights on the seats, providing visual guidance along the cabin floor to the emergency exit(s) in darkness or in a smoke-filled cabin; or
- (b) for a VCA with a maximum operational passenger seating configuration (MOPSC) of 6 or less, illumination of the instruments or illumination of the emergency-exit marking and locating signs if such illumination provides visual guidance to the emergency exit(s) in darkness and in a smoke-filled cabin and is independent of the VCA normal electric power supply.

AMC1 UAM.IDE.MVCA.280 Emergency locator transmitters (ELTs)

AUTOMATIC ELT OR AUTOMATIC TRACKING DEVICE

- (a) An automatic ELT fitted on the VCA should comply with ETSO-C126b or ETSO-C126c, as applicable according to the date of issue of the individual CofA. First Generation Beacon (FGB) ELTs should be able to transmit an encoded position of the VCA from an internal GNSS receiver.
- (b) The airborne system used in order to comply with point UAM.IDE.MVCA.280, when not based on an automatic ELT, should:
 - (1) be combined with an ELT(S) or a PLB;
 - (2) comply with the applicable ETSO;
 - (3) comply with the Certification Specifications for Airborne Communications, Navigation and Surveillance (CS-ACNS) issued by EASA, or equivalent,and
the transmission service provider should be certified in accordance with Regulation (EU) 2017/373 (the 'ATM/ANS Regulation').
- (c) The ground part of the VCA tracking system should automatically identify an abnormal lack of position reporting and alert the operator. It should also be capable of automatically transmitting tracking data and alerting signals to search and rescue services.

GM1 UAM.IDE.MVCA.280 Emergency locator transmitters (ELTs)

AUTOMATIC ELT OR AUTOMATIC TRACKING DEVICE

- (a) ETSO-C126b is applicable for VCA first issued with an individual CofA on or before 1 July 2030. ETSO-C126c is applicable for VCA first issued with an individual CofA after 1 July 2030.
- (b) A First Generation Beacon (FGB) ELT is an ELT that has been approved in accordance with ETSO-C126b or ETSO-C126c with capability 'First generation'. A Second Generation Beacon (FGB) ELT is an ELT that has been approved in accordance with ETSO-C126c with capability 'Second generation'.
- (c) A 'tracking system compliant with the applicable ETSO' means that it either complies with a particular ETSO or is part of the certified type design definition of the VCA.

AMC2 UAM.IDE.MVCA.280 Emergency locator transmitters (ELTs)

TYPES OF ELT AND GENERAL TECHNICAL SPECIFICATIONS

- (a) Point (a) of AMC2 CAT.IDE.H.280 lists the applicable types of ELTs. An 'automatic ELT' means an ELT(AF), ELT(AP) or ELT(AD).
- (b) To minimise the possibility of damage in the event of crash impact, the automatic ELT should be rigidly fixed to the VCA structure, as far as this is practicable, with its antenna and

connections arranged so as to maximise the probability of the signal being transmitted after a crash.

- (c) Any ELT carried should operate in accordance with the relevant provisions of ICAO Annex 10 'Aeronautical Telecommunications' Volume III and should be registered with the national agency responsible for initiating search and rescue or any other competent agency.

AMC3 UAM.IDE.MVCA.280 Emergency locator transmitters (ELTs)

PLB TECHNICAL SPECIFICATIONS

- (a) A PLB should have a search and rescue satellite-aided tracking (COSPAS-SARSAT) type approval number. However, devices with a COSPAS-SARSAT number belonging to series 700 are excluded as this series of numbers identifies the special-use beacons not meeting all the technical requirements and all the tests specified by COSPAS-SARSAT.
- (b) A First Generation PLB should have a built-in GNSS receiver.
- (c) Any PLB carried should be registered with the national agency responsible for initiating search and rescue or any other competent agency.

AMC4 UAM.IDE.MVCA.280 Emergency locator transmitters (ELTs)

BRIEFING ON THE USE OF PLB

When a PLB is carried by a passenger, the PIC should brief that passenger, prior to the flight, on the PLB characteristics and use.

AMC5 UAM.IDE.MVCA.280 Emergency locator transmitters (ELTs)

ELT AND PLB BATTERIES

- (a) All batteries used in ELTs or PLBs should be replaced (or recharged, if the battery is rechargeable) when the equipment has been in use for more than 1 cumulative hour or in the following cases:
 - (1) Batteries specifically designed for use in ELTs and having an airworthiness release certificate (EASA Form 1 or equivalent) should be replaced or recharged before the end of their useful life in accordance with the maintenance instructions applicable to the ELT.
 - (2) Standard batteries manufactured in accordance with an industry standard and not having an airworthiness release certificate (EASA Form 1 or equivalent), when used in ELTs, should be replaced or recharged when 50 % of their useful life, as established by the battery manufacturer, has expired.
 - (3) All batteries used in PLBs should be replaced or recharged when 50 % of their useful life, as established by the battery manufacturer, has expired.
 - (4) The battery useful life criteria in points (1), (2) and (3) do not apply to batteries (such as water-activated batteries) that are essentially unaffected during probable storage intervals.

- (b) The new expiry date for a replaced or recharged battery should be legibly marked on the outside of the equipment.

AMC1 UAM.IDE.MVCA.300;310;311 Flights over water / Life rafts / Survival equipment

SURVIVAL ELT (ELT(S))

- (a) An ELT(S) is an ELT that can be removed from a VCA. The ELT(S) should be so stowed as to facilitate its ready use in an emergency. The ELT(S) should be activated manually by a survivor or automatically. The automatic activation of an ELT(S) should result from water immersion.
- (b) The ELT(S) should be carried:
- (1) on a crew member; or
 - (2) on a passenger or in a life raft; or
 - (3) adjacent to an emergency exit used for the evacuation of the VCA in an emergency.
- (c) An automatic portable ELT (ELT(AP)) may be used to replace one required ELT(S) provided that it meets the ELT(S) requirements. A water-activated ELT(S) is not an ELT(AP).

GM1 UAM.IDE.MVCA.300 Flights over water

LIMITED OVERWATER OPERATIONS

For limited overwater operations, the term 'water' refers to all types of waterbodies, including hostile seas, non-hostile seas, lakes, rivers, etc.

GM2 UAM.IDE.MVCA.300 Flights over water

TOTAL FLYING TIME

The total flying time is meant to be the cumulative time of all periods during which the VCA is operated over water.

GM3 UAM.IDE.MVCA.300 Flights over water

LANDING OR TAKE-OFF IS PERFORMED OVER WATER

The condition 'landing or take-off is performed over water' may include one of the following:

- (a) taking off from or landing at a vertiport, diversion location or VEMS operating site where the take-off or approach path is over water;
- (b) landing on or taking off from a fixed or floating platform in the water or a vessel suitable for that purpose.

AMC1 UAM.IDE.MVCA.305 Life jackets and other equipment

ELECTRIC ILLUMINATION

The means of electric illumination should include a survivor locator light as defined in the applicable ETSO issued by EASA or equivalent.

GM1 UAM.IDE.MVCA.305 Life jackets and other equipment

SEAT CUSHIONS

Seat cushions are not considered flotation devices.

GM2 UAM.IDE.MVCA.305 Life jackets and other equipment

SUPPORT ACTIVITIES

Flights referred to in point UAM.IDE.MVCA.305(c) include operations for the purpose of:

- support of offshore oil, gas and mineral exploration, production, storage and transport;
- support to offshore wind turbines and other renewable-energy sources; or
- support to ships, including sea pilot transfer.

AMC1 UAM.IDE.MVCA.310 Life rafts

LIFE RAFTS AND EQUIPMENT FOR MAKING DISTRESS SIGNALS

- (a) Each required life raft should conform to the following specifications:
- (1) should be of an approved design and stowed so as to facilitate its readily use in an emergency;
 - (2) should be radar conspicuous to standard airborne radar equipment.
- (b) In addition to the specifications under point (a):
- (1) when carrying more than one life raft on board, at least 50 % should be deployable by the crew while seated at their normal station, where necessary by remote control; and
 - (2) life rafts that are not deployable by remote control or by the crew should be of such weight as to permit their handling by one person. 40 kg should be considered a maximum weight.
- (c) Each required life raft should contain at least the following:
- (1) one approved survivor locator light;
 - (2) one approved visual signalling device;
 - (3) one canopy (for use as a sail, sunshade or rain catcher) or other means to protect occupants from the elements;
 - (4) one radar reflector;

- (5) one 20-m retaining line designed to hold the life raft near the VCA but to release it if the VCA becomes totally submerged;
- (6) one sea anchor;
- (7) one survival kit, appropriately equipped for the route to be flown, which should contain at least the following:
 - (i) one life raft repair kit;
 - (ii) one bailing bucket;
 - (iii) one signalling mirror;
 - (iv) one police whistle;
 - (v) one buoyant raft knife;
 - (vi) one supplementary means of inflation;
 - (vii) sea sickness tablets;
 - (viii) one first-aid kit;
 - (ix) one portable means of illumination;
 - (x) 500 ml of pure water and one sea water desalting kit; and
 - (xi) one comprehensive illustrated survival booklet in an appropriate language.

AMC1 UAM.IDE.MVCA.311 Survival equipment

ADDITIONAL SURVIVAL EQUIPMENT

- (a) The following additional survival equipment should be carried when required:
 - (1) 500 ml of water for each 4, or fraction of 4, persons on board;
 - (2) one knife;
 - (3) first-aid equipment; and
 - (4) one set of air/ground codes.
- (b) If any item of equipment contained in the above list is already carried on board the VCA in accordance with another requirement, there is no need for the list to be duplicated.

GM1 UAM.IDE.MVCA.311 Survival equipment

SIGNALLING EQUIPMENT

The signalling equipment for making distress signals is described in ICAO Annex 2 'Rules of the Air'.

GM2 UAM.IDE.MVCA.311 Survival equipment

AREAS WHERE SEARCH AND RESCUE WOULD BE PARTICULARLY DIFFICULT

The phrase ‘areas in which search and rescue would be particularly difficult’ means:

- (a) areas so designated by the authority responsible for managing search and rescue; or
- (b) areas that are largely uninhabited and where:
 - (1) the authority referred to in point (a) has not published any information to confirm whether search and rescue would or would not be particularly difficult; and
 - (2) the authority referred to in point (a) does not, as a matter of policy, designate areas as being particularly difficult for search and rescue.

GM1 UAM.IDE.MVCA.315 Equipment for on-water operations

INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA

The International Regulations for Preventing Collisions at Sea are those that were published by the International Maritime Organization (IMO) in 1972.

AMC1 UAM.IDE.MVCA.325 Headsets

GENERAL

- (a) A headset consists of a communication device that includes two earphones to receive and a microphone to transmit audio signals to the VCA communication system. To comply with the minimum performance requirements, both the earphones and the microphone should match the communication system’s characteristics and the cockpit environment. The headset should be adequately adjustable in order to fit the pilot’s head. Headset boom microphones should be of the noise-cancelling type.
- (b) If the intention is to utilise noise-cancelling earphones, the operator should ensure that the earphones do not attenuate any aural warnings or sounds necessary for alerting the flight crew on matters related to the safe operation of the VCA.

GM1 UAM.IDE.MVCA.325 Headsets

GENERAL

The term ‘headset’ includes any aviation helmet incorporating headphones and microphone worn by a flight crew member.

GM1 UAM.IDE.MVCA.345 Navigation equipment

APPLICABLE AIRSPACE REQUIREMENTS

The applicable airspace requirements are those contained in Commission Implementing Regulation (EU) 2023/1770 of 12 September 2023 laying down provisions on aircraft equipment required for the

use of the Single European Sky airspace and operating rules related to the use of the Single European Sky airspace and repealing Regulation (EC) No 29/2009 and Implementing Regulations (EU) No 1206/2011, (EU) No 1207/2011 and (EU) No 1079/2012¹¹.

GM1 UAM.IDE.MVCA.350 Transponders

SSR TRANSPONDER

The requirements for the carriage and operation of SSR transponders according to the class of airspace being flown, relevant for VFR operations by day, are those contained in Regulation (EU) No 923/2012.

AMC1 UAM.IDE.MVCA.355 Management of aeronautical databases

AERONAUTICAL DATABASES

When a VCA operator uses an aeronautical database that supports an airborne navigation application as a primary means of navigation used to meet the airspace usage requirements, the database provider should be a Type 2 DAT provider certified in accordance with Regulation (EU) 2017/373 or equivalent.

GM1 UAM.IDE.MVCA.355 Management of aeronautical databases

AERONAUTICAL DATABASE APPLICATIONS

- (a) Applications using aeronautical databases for which Type 2 DAT providers should be certified in accordance with Regulation (EU) 2017/373 may be found in GM1 DAT.OR.100 of the AMC & GM to Part-DAT of that Regulation.
- (b) The certification of a Type 2 DAT provider in accordance with Regulation (EU) 2017/373 ensures data integrity and compatibility with the certified VCA application/equipment.

AMC2 UAM.IDE.MVCA.355 Management of aeronautical databases

TIMELY DISTRIBUTION OF AERONAUTICAL DATABASES

The operator should distribute current and unaltered aeronautical databases to all VCA that require them in accordance with the validity period of the databases or, if no validity period is defined, in accordance with a procedure established in the operations manual.

¹¹ OJ L 228, 15.9.2023, p. 39 (http://data.europa.eu/eli/reg_impl/2023/1770/oj)