

**Draft ANNEX V to draft COMMISSION IMPLEMENTING REGULATION (EU) .../...
amending Regulation (EU) No 965/2012, Regulation (EU) No 1178/2011, Implementing
Regulation (EU) No 923/2012 and Implementing Regulation (EU) 2017/373 as regards the
establishment of requirements for the operation of manned aircraft with a vertical take-off and
landing capability**

ANNEX V

The following Annex IX (Part-IAM) is added to Regulation (EU) No 965/2012:

'ANNEX IX

**INNOVATIVE AIR MOBILITY OPERATIONS
(Part-IAM)**

SUBPART A

GENERAL REQUIREMENTS

IAM.GEN.050 Scope

This Annex shall apply to operations with manned VTOL-capable aircraft (VCA) in accordance with VFR by day.

IAM.GEN.055 Competent authority

The competent authority of the VCA operator shall be the authority designated by the Member State where that operator has its principal place of business or its place of residence, or the Agency in accordance with Article 65 of Regulation (EU) 2018/1139.

SECTION 1

VTOL-capable aircraft (VCA)

IAM.GEN.VCA.050 Scope

This Section contains general requirements for the operation of VCA.

IAM.GEN.VCA.100 Crew responsibilities

- (a) Pilots and other crew members shall be responsible for the proper execution of their duties that are:
 - (1) related to the safety of the VCA and its occupants; and
 - (2) specified in the operations manual (OM) of the VCA operator.
- (b) Pilots and other crew members shall:

- (1) report, if not already reported, to the pilot-in-command (PIC) any fault, failure, malfunction or defect which they believe may affect the airworthiness or safe operation of the VCA, including emergency systems;
 - (2) report, if not already reported, to the PIC any incident that has endangered, or could have endangered, the safety of the operation of the VCA;
 - (3) comply with the relevant requirements of the operator's occurrence-reporting scheme;
 - (4) comply with the flight time, duty time and rest requirements applicable to their activities;
 - (5) not disable or switch off the recorders during flight, or intentionally erase their recordings.
- (c) Pilots and other crew members shall not perform duties related to the operation of VCA:
- (1) when they are under the influence of psychoactive substances or when they are unfit due to injury, fatigue, medication, sickness or other similar causes;
 - (2) if they do not fulfil applicable medical requirements;
 - (3) if they are in any doubt as to being able to accomplish their assigned duties;
 - (4) if they know or suspect they suffer from fatigue as referred to in point 7.5 of Annex V to Regulation (EU) 2018/1139 or otherwise feel unfit to the extent that the safety of the flight may be endangered.

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

- (a) In addition to complying with point IAM.GEN.VCA.100, the PIC shall, as soon as they assume the command functions at the assigned station and until they hand over the command functions or leave the assigned station at the end of the flight:
- (1) be responsible for the safety of all crew members, passengers and cargo on board the VCA;
 - (2) be responsible for the operation and safety of the VCA when the lift/thrust units are powered on;
 - (3) be responsible for the initiation, continuation, termination or diversion of a flight in the interest of safety;
 - (4) have the authority to give all commands and take any appropriate actions for the purpose of ensuring the safety of the VCA and of the persons and/or property carried in it;
 - (5) ensure that all passengers are briefed on the location of emergency exits, and on the location and use of relevant safety and emergency equipment, as applicable;
 - (6) ensure that all passengers are briefed on when and how to communicate with the flight crew member(s) during the flight;
 - (7) ensure that all operational procedures and checklists are complied with in accordance with the operations manual (OM) of the VCA operator;
 - (8) not permit any crew member to perform any activity during critical phases of flight, except for duties required for the safe operation of the VCA;
 - (9) ensure that the recorders are not disabled or switched off during the flight, and that their recordings are not intentionally erased;

- (10) decide on the acceptance of a VCA with unserviceability in accordance with the VCA configuration deviation list (CDL) or the minimum equipment list (MEL), and the VCA technical logbook;
 - (11) ensure that the pre-flight inspection has been carried out in accordance with the applicable continuing airworthiness requirements;
 - (12) be satisfied that the relevant emergency equipment remains easily accessible for immediate use;
 - (13) record, at the termination of the flight, in accordance with the continuing airworthiness record system requirements, utilisation data and all known or suspected defects of the VCA to ensure continued flight safety.
- (b) The PIC shall, in an emergency situation that requires immediate decision and action, take any action they consider necessary under the circumstances. In such cases, the PIC may deviate from rules, operational procedures and methods in the interest of safety.
- (c) The PIC shall, as soon as practicable, report to the appropriate air traffic services (ATS) unit any hazardous weather or flight conditions encountered during the flight that are likely to affect the safety of other VCA operations.

IAM.GEN.VCA.110 Authority of the pilot-in-command

The VCA operator shall take all reasonable measures to ensure that all persons carried on board VCA obey all lawful commands given by the PIC for the purpose of ensuring the safety of the VCA and of the persons or property carried in it.

IAM.GEN.VCA.120 Common language

The operator shall ensure that all crew members can communicate with each other in a common language.

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

The VCA's lift/thrust units shall only be powered on for the purpose of flight by a qualified pilot at the VCA controls.

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

The VCA operator shall not permit any person to use a PED on board an aircraft that could adversely affect the performance of the VCA's systems and equipment, and shall take all reasonable measures to prevent such use.

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

- (a) When an EFB is used on board an aircraft, the VCA operator shall ensure that it does not adversely affect the performance of the VCA's systems or equipment, or the ability of the flight crew member to operate the VCA.
- (b) The operator shall not use a type B EFB application unless it is approved in accordance with Subpart M of Annex V (Part-SPA).

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

The VCA operator shall at all times have available for immediate communication to rescue coordination centres (RCCs) lists containing information on the emergency and survival equipment carried on board any of its VCA.

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

The VCA operator shall not accept weapons of war or munitions of war for carriage by air in the VCA.

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

- (a) The operator shall not accept sporting weapons for carriage by air in the VCA unless:
- (1) they can be stowed in the VCA in a place that is inaccessible to passengers during the flight; and
 - (2) all ammunition is unloaded and carried separately from the sporting weapons.

IAM.GEN.VCA.165 Method of carriage of persons

The VCA operator shall take all reasonable measures to ensure that no person is located in any part of the VCA in flight which is not designed or designated for the accommodation of persons, except when a person takes an action that is necessary for the safety of the VCA or of any person, animal or goods carried in the VCA.

IAM.GEN.VCA.170 Psychoactive substances

- (a) The VCA operator shall take all reasonable measures to ensure that no person enters or is aboard the VCA when under the influence of psychoactive substances to the extent that the safety of the VCA or its occupants is likely to be endangered.
- (b) The VCA operator shall develop and implement an objective, transparent and non-discriminatory policy and procedure on the prevention and detection of misuse of psychoactive substances by the pilots and other safety-sensitive personnel under the VCA operator's direct control, in order to ensure that the safety of the VCA and its occupants is not endangered.
- (c) If pilots or other safety-sensitive personnel are tested positive to psychoactive substances, the VCA operator shall inform its competent authority and the authority that is responsible for the pilots and the personnel concerned.

IAM.GEN.VCA.175 Endangering safety

- (a) The VCA operator shall take all reasonable measures to ensure that no person recklessly, intentionally or negligently acts, or omits to act, so as to:
- (1) endanger the safety of the VCA or the safety of the persons in it; or
 - (2) cause or permit the VCA to endanger any person or property.
- (b) The VCA operator shall ensure that pilots undergo a psychological assessment before commencing flight operations in order to:
- (1) identify the pilots' psychological attributes and suitability in respect of their work environment; and
 - (2) reduce the likelihood of pilots negatively interfering with the safe operation of the VCA.

IAM.GEN.VCA.176 Pilot support programme

- (a) The VCA operator shall enable, facilitate and ensure access to a proactive and non-punitive support programme that will assist and support pilots in recognising, coping with, and overcoming any problem which might negatively affect their ability to safely exercise the privileges of their licence.
- (b) Without prejudice to applicable national legislation on the protection of individuals with regard to the processing of personal data and on the free movement of such data, the protection of the confidentiality of personal data shall be a precondition for an effective pilot support programme as it encourages the use of such a programme and ensures its integrity.

IAM.GEN.VCA.185 Information to be preserved on the ground

- (a) The VCA operator shall ensure that for the duration of each flight, or series of flights, information that is relevant to the flight, or series of flights, and appropriate for the type of operation:
 - (1) is preserved on the ground; and
 - (2) is retained until it has been duplicated at the place at which it will be stored; or, if this is impracticable,
 - (3) is carried in a fireproof container in the VCA.
- (b) The information referred to in point (a) includes all the following:
 - (1) a copy of the operational flight plan;
 - (2) copies of the relevant part(s) of the aircraft continuing airworthiness records;
 - (3) route-specific NOTAM documentation, if specifically edited by the VCA operator;
 - (4) mass and balance documentation;
 - (5) special loads notification.

IAM.GEN.VCA.190 Provision of documentation and records

The PIC shall, within a reasonable time of being requested to do so by a person authorised by an authority, provide that person with the documentation required to be carried on board, in paper or digital media.

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

- (a) Following an accident, a serious incident or an occurrence identified by the investigating authority, the VCA operator shall preserve the original recorded data of the recorder, carried in the VCA in accordance with Subpart D of this Annex, for a period of 60 days or until otherwise directed by the investigating authority.
- (b) The VCA operator shall conduct operational checks and evaluations of the recordings to ensure the continued serviceability of the recorder.
- (c) The VCA operator shall ensure that the recordings of flight parameters required to be recorded on a recorder are preserved. For the purpose of testing and maintaining the recorder, up to 1 hour of the oldest recorded material at the time of testing may be erased.

- (d) The VCA operator shall keep and maintain up to date the documentation that contains the necessary information to convert raw flight data into flight parameters expressed in engineering units.
- (e) The VCA operator shall make available any recording of the recorder that has been preserved, if so determined by the competent authority.
- (f) Without prejudice to Regulation (EU) No 996/2010 ⁽¹⁾ and Regulation (EU) 2016/679 ⁽²⁾:
 - (1) except for ensuring the serviceability of a recorder, audio recordings shall not be disclosed or used unless all the following conditions are fulfilled:
 - (i) a procedure related to the handling of such audio recordings and of their transcript is in place;
 - (ii) all pilots and maintenance personnel concerned have given their prior consent;
 - (iii) such audio recordings are used only for maintaining or improving safety;
 - (2) when inspecting the audio recordings of a recorder to ensure the serviceability of that recorder, the VCA operator shall protect the privacy of those audio recordings and make sure that they are not disclosed or used for purposes other than for ensuring the serviceability of the recorder;
 - (3) flight parameters recorded by a recorder shall not be used for purposes other than for the investigation of an accident or an incident which is subject to mandatory reporting, unless such recordings meet any of the following conditions:
 - (i) are used by the VCA operator for airworthiness or maintenance purposes only;
 - (ii) are de-identified;
 - (iii) are disclosed under secure procedures;
 - (4) except for ensuring the serviceability of a recorder, recorded images of the flight crew compartment shall not be disclosed or used unless all the following conditions are fulfilled:
 - (i) a procedure related to the handling of such image recordings is in place;
 - (ii) all pilots and maintenance personnel concerned have given their prior consent;
 - (iii) such image recordings are used only for maintaining or improving safety;
 - (5) when images of the flight crew compartment, recorded by a recorder, are inspected for ensuring the serviceability of that recorder, then:
 - (i) those images shall not be disclosed or used for purposes other than for ensuring the serviceability of the recorder;
 - (ii) if body parts of pilots or passengers are likely to be visible on the images, the operator shall ensure the privacy of those images.

¹ 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).

² Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation) (OJ L 119, 4.5.2016, p. 1).

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

- (a) The transport of dangerous goods by air shall be conducted in accordance with Annex 18 to the Chicago Convention, as last amended and amplified by the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284-AN/905), including its supplements and any other addenda or corrigenda.
- (b) The VCA operator shall be approved for the carriage of dangerous goods by air as cargo in accordance with Subpart G of Annex V (Part-SPA).
- (c) The VCA operator shall establish procedures to ensure that all reasonable measures are taken to prevent undeclared or misdeclared dangerous goods from being carried on board inadvertently.
- (d) The VCA operator shall ensure that all personnel, including third-party personnel, involved in the acceptance, handling, loading and unloading of cargo are informed of the operator's operational approval and limitations with regard to the transport of dangerous goods by air, and are provided with the necessary information enabling them to carry out their responsibilities, as required by the Technical Instructions.
- (e) The VCA operator shall, in accordance with the Technical Instructions, ensure that passengers are provided with information about the carriage of dangerous goods on board.
- (f) The VCA operator shall, in accordance with the Technical Instructions, report without delay to the competent authority and the appropriate authority of the State of occurrence in the event of:
 - (1) any accidents or incidents involving dangerous goods;
 - (2) the discovery of undeclared or misdeclared dangerous goods in cargo or mail; or
 - (3) 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.
- (g) The VCA operator shall ensure that notices giving information about the transport of dangerous goods are provided at acceptance points for cargo as required by the Technical Instructions.

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

- (a) The transport of dangerous goods by air shall be conducted in accordance with Annex 18 to the Chicago Convention, as last amended and amplified by the Technical Instructions for the Safe Transport of Dangerous Goods by Air (ICAO Doc 9284-AN/905), including its supplements and any other addenda or corrigenda.
- (b) Dangerous goods shall be carried by operators on board VCA without the specific approval required under Subpart G of Annex V (Part-SPA) if:
 - (1) they are not subject to the Technical Instructions in accordance with Part 1 thereof; or
 - (2) they are carried by passengers or crew, or are in baggage, in accordance with Part 8 of the Technical Instructions.
- (c) VCA operators not approved in accordance with Subpart G of Annex V (Part-SPA), shall establish a dangerous goods training programme that meets the requirements of ICAO Annex 18 and the applicable requirements of Part 1 Chapter 4 of the Technical Instructions.
- (d) The VCA operator shall ensure that passengers are provided with information about the carriage of dangerous goods in accordance with the Technical Instructions.

- (e) The VCA operator shall establish procedures to ensure that all reasonable measures are taken to prevent undeclared dangerous goods from being carried on board inadvertently.
- (f) The VCA operator shall, in accordance with the Technical Instructions, report without delay to the competent authority and the appropriate authority of the State of occurrence in the event of:
 - (1) any accidents or incidents involving dangerous goods;
 - (2) the discovery of undeclared dangerous goods in cargo or mail; or
 - (3) 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.

SECTION 2

Manned VTOL-capable aircraft (MVCA)

IAM.GEN.MVCA.050 Scope

This Section establishes additional requirements for the operation of manned VTOL-capable aircraft (MVCA).

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

- (a) The VCA operator shall ensure that no person, other than the pilot assigned to a flight, is admitted to, or carried in, the flight crew compartment unless that person is:
 - (1) an operating crew member;
 - (2) a representative of the competent authority or inspecting authority, if this is required for the performance of their official duties; or
 - (3) permitted by and carried in accordance with the operator's OM.
- (b) The pilot-in-command shall ensure that:
 - (1) admission to the flight crew compartment does not cause distraction or interference with the conduct of the flight; and
 - (2) all persons carried in the flight crew compartment are made familiar with the relevant safety procedures.
- (c) The pilot-in-command shall make the final decision regarding admission to the flight crew compartment in the VCA.

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

- (a) The following documents, manuals and information, in paper or digital media, shall be carried on each flight with a VCA and shall be easily accessible for inspection purposes:
 - (1) the aircraft flight manual (AFM), or equivalent document(s);
 - (2) the original certificate of registration of the aircraft;
 - (3) the original certificate of airworthiness (CofA);

- (4) the noise certificate, including an English translation where one has been provided by the authority that is responsible for issuing the noise certificate;
 - (5) a certified true copy of the air operator certificate (AOC), including an English translation when the AOC has been issued in another language;
 - (6) the operations specifications relevant to the aircraft type, issued with the AOC, including an English translation when the operations specifications have been issued in another language;
 - (7) the original aircraft radio licence, if applicable;
 - (8) the third-party liability insurance certificate(s);
 - (9) the journey log, or equivalent, for the aircraft;
 - (10) the continuing airworthiness records, as applicable;
 - (11) details of the filed ATS flight plan, if applicable;
 - (12) current and suitable aeronautical charts for the route of the proposed flight and all routes along which it is reasonable to expect that the flight may be diverted;
 - (13) procedures and information on visual signals for use by intercepting and intercepted aircraft;
 - (14) information concerning search and rescue services for the area of the intended flight, which shall be easily accessible in the aircraft;
 - (15) the current parts of the OM that are relevant to the duties of the pilots, which shall be easily accessible to those pilots;
 - (16) the MEL;
 - (17) appropriate notices to airmen (NOTAMs) and aeronautical information service (AIS) briefing documentation;
 - (18) appropriate meteorological information;
 - (19) cargo and/or passenger manifests;
 - (20) mass and balance documentation;
 - (21) the operational flight plan, where required;
 - (22) notification about special categories of passenger (SCPs), if applicable; and
 - (23) any other documentation that may be pertinent to the flight or is required by the States concerned with the flight.
- (b) The documents, manuals, and information carried on each flight shall be accessible to authorised persons, usable, and reliable.
- (c) Notwithstanding point (a), in case of loss or theft of the documents specified in points (a)(2) to (8), the operation may continue until the flight reaches its destination or a place where replacement documents can be provided.

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

- (a) Notwithstanding point IAM.GEN.MVCA.180, for VCA operations in accordance with VFR by day, taking off and landing at the same vertiport within 24 hours, or remaining within a local area specified in the OM, the following documents and information may be retained at the vertiport instead of being carried on board each flight:
- (1) noise certificate;
 - (2) aircraft radio licence;
 - (3) journey log, or equivalent;
 - (4) continuing airworthiness records;
 - (5) notices to airmen (NOTAMs) and aeronautical information service (AIS) briefing documentation;
 - (6) meteorological information;
 - (7) notification about special categories of passengers (SCPs), if applicable; and
 - (8) mass and balance documentation.

SUBPART B
OPERATING PROCEDURES

SECTION 1
VTOL-capable aircraft (VCA)

UAM.OP.VCA.050 Scope

This Section establishes the requirements for operations with VTOL-capable aircraft (VCA).

UAM.OP.VCA.101 Altimeter check and altimeter settings

- (a) The VCA operator shall establish procedures for altimeter checking before each departure.
- (b) The VCA operator shall establish procedures for altimeter settings for all phases of flight, which shall take into account the procedures established by the State of the vertiport or, if applicable, by the State of the airspace flown.

UAM.OP.VCA.125 Taxiing and ground movement

- (a) The VCA operator shall establish standard and contingency procedures for the taxiing of VCA (in the air and on the ground) and for the movement of VCA on the ground in order to ensure the safe operation of the VCA at the vertiport, diversion location or operating site. In particular, the VCA operator shall consider the risk of collision between a taxiing VCA or a VCA being moved and another aircraft or other objects, as well as the risk of injuries to ground personnel. The VCA operator's procedures shall be coordinated with the operator of the vertiport, the diversion location or the operating site, as applicable.
- (b) The VCA shall be taxied on the movement area of a vertiport, diversion location or operating site:
 - (1) by an appropriately qualified pilot at the controls of the VCA; or
 - (2) in the case of ground taxiing without passengers for a purpose other than taking off, by a person at the controls of the VCA, designated by the VCA operator, after having received appropriate training and instructions.
- (c) The VCA operator shall ensure that the ground movement of a VCA on the movement area of a vertiport, diversion location or operating site is carried out or supervised by personnel that have received appropriate training and instructions.

UAM.OP.VCA.130 Noise-abatement procedures

- (a) When developing operating procedures, the VCA operator shall take into account the need to minimise the effect of noise and any published noise-abatement procedures.
- (b) The VCA operator's procedures shall:
 - (1) ensure that safety has priority over noise abatement; and
 - (2) be simple and safe to implement by not significantly increasing flight crew workload during critical phases of flight.

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

- (a) The VCA operator shall ensure that operations are only conducted along routes or within areas for which:
 - (1) space-based facilities, ground facilities and services, and meteorological services, adequate for the planned operation, are provided;
 - (2) adequate vertiports, diversion locations or operating sites are available that permit a landing to be executed in the case of critical failure for performance (CFP) of the VCA;
 - (3) the performance of the VCA is adequate to comply with minimum flight altitude requirements;
 - (4) the equipment of the VCA meets the minimum requirements for the planned operation; and
 - (5) appropriate maps and charts are available.
- (b) The VCA operator shall ensure that operations are conducted in accordance with any restriction on the routes or the areas of operation specified by the competent authority.

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

- (a) For all route segments to be flown, the VCA operator shall establish:
 - (1) minimum flight altitudes that provide the required vertical clearance from terrain and obstacles, taking into account the relevant requirements of Subpart C of this Annex and the minima established by the State where the operation takes place; and
 - (2) a method for the pilot to determine the altitudes referred to in point (1).
- (b) The method for establishing minimum flight altitudes shall be approved by the competent authority.
- (c) Where the minimum flight altitudes established by the VCA operator and the State where the operation takes place differ, the higher values shall apply.

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

- (a) The VCA operator shall establish, implement and maintain a fuel/energy scheme that comprises policies and procedures for:
 - (1) fuel/energy planning and fuel/energy in-flight replanning;
 - (2) selection of vertiports, diversion locations or operating sites; and
 - (3) in-flight fuel/energy management.
- (b) The fuel/energy scheme shall:
 - (1) be appropriate for the intended operation; and
 - (2) correspond to the capacity of the VCA operator to support its implementation.
- (c) The fuel/energy scheme shall be included in the operations manual.
- (d) The fuel/energy scheme and any changes to it shall require the prior approval of the competent authority.

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

The VCA operator shall ensure that:

- (a) the VCA carries a sufficient amount of usable fuel/energy and reserves to safely complete the planned flight and to allow for deviations from the planned operation;
- (b) the planned amount of usable fuel/energy for the intended flight is based on all the following:
 - (1) fuel/energy consumption data provided in the AFM or current aircraft-specific data derived from a fuel/energy consumption monitoring system;
 - (2) the conditions under which the flight is to be operated, including but not limited to:
 - (i) performance required for the intended flight to the destination, including vertiports, diversion locations or operating sites, selected along the route;
 - (ii) anticipated masses;
 - (iii) NOTAMs;
 - (iv) anticipated meteorological conditions;
 - (v) the effects of deferred maintenance items in accordance with the VCA operator's MEL and/or of configuration deviations in accordance with the VCA operator's CDL;
 - (vi) the expected departure and arrival routing, and anticipated delays.
 - (3) the efficiency and capacity of energy storage devices for the planned operating conditions, considering degradation of those energy storage devices as appropriate;
- (c) the pre-flight calculation of the usable fuel/energy and reserves for a flight includes:
 - (1) taxi fuel/energy that shall not be less than the amount expected to be used prior to take-off;
 - (2) trip fuel/energy that shall be the amount of fuel/energy that is needed to enable the aircraft to fly from take-off, or from the point of in-flight replanning, to landing at the destination vertiport, diversion location or operating site, taking into account the operating conditions of point (b)(2);
 - (3) contingency fuel/energy that shall be the amount of fuel/energy needed to compensate for unforeseen factors that could have an influence on the fuel/energy consumption to the destination vertiport, diversion location or operating site;
 - (4) final reserve fuel/energy that shall be determined based on all the following:
 - (i) a representative time provided in the AFM to perform a go-around from a landing decision point (LDP) and back to that LDP taking into account the certified minimum performance (CMP) of the VCA;
 - (ii) conservative ambient conditions from the point of view of fuel/energy consumption;
 - (iii) an appropriate configuration/speed to perform the go-around and approach procedures;
 - (iv) a conservative fuel/energy consumption;
 - (5) additional fuel/energy that shall be the amount of fuel/energy to enable the VCA to perform a safe landing at a vertiport, diversion location or operating site, selected along the route, taking into account the CMP of the VCA at any point of the route; this additional fuel/energy

is required only if the amount of fuel/energy that is calculated according to points (c)(2) and (c)(3) is not sufficient for such event;

- (6) extra fuel/energy to take into account anticipated delays or specific operational constraints; and
- (7) discretionary fuel/energy, if required by the PIC;
- (d) if a flight must proceed along a route or to a destination vertiport, diversion location or operating site other than that originally planned, in-flight replanning procedures for calculating the required usable fuel/energy include those referred to in point (b)(2) and in points (c)(2) to (6).

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

- (a) The VCA operator shall establish policies and procedures ensuring that in-flight fuel/energy checks and fuel/energy management are performed.
- (b) The PIC shall monitor the amount of usable fuel/energy remaining in the VCA to ensure that it is protected and not less than the fuel/energy required to proceed to the selected destination vertiport, diversion location or operating site where a safe landing can be performed.
- (c) When a change to the clearance to proceed to a specific vertiport, diversion location or operating site at which the PIC has committed to land may result in landing with less than the planned final reserve fuel/energy, they shall advise air traffic control (ATC) of a ‘minimum fuel/energy’ state by declaring ‘MINIMUM FUEL’.
- (d) The PIC shall declare a situation of ‘fuel/energy emergency’ by broadcasting ‘MAYDAY MAYDAY MAYDAY FUEL’ when the usable fuel/energy that is calculated to be available upon landing at the nearest vertiport, diversion location or operating site where a safe landing can be performed is less than the planned final reserve fuel/energy.

UAM.OP.VCA.210 Pilots at their assigned stations

- (a) During take-off and landing, the pilot required to be on duty shall be at their assigned station.
- (b) During all other phases of flight, the pilot required to be on duty shall remain at their assigned station, unless absence is necessary for the performance of duties in connection with the operation or for physiological needs. Where absence is necessary for the above-mentioned reasons, the control of the VCA shall be handed over to another suitably qualified pilot.
- (c) During all phases of flight, the pilot required to be on duty shall remain alert. If the pilot realises a lack of alertness, appropriate countermeasures shall be taken.

UAM.OP.VCA.245 Meteorological conditions

The VCA operator shall ensure that the aircraft is operated within the weather operating limitations it is certified for, and considering current and forecast weather conditions for the entire duration of the flight.

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

- (a) The VCA operator shall establish procedures to be followed when ground de-icing and anti-icing treatment and related inspections of the VCA are necessary for its safe operation.
- (b) The PIC shall commence take-off only if the VCA is clear of any deposit that might adversely affect its performance or controllability in accordance with its AFM.

UAM.OP.VCA.255 Ice and other contaminants — flight procedures

- (a) The VCA operator shall establish procedures for flights in expected or actual icing conditions.
- (b) The PIC shall commence the flight or intentionally fly into expected or actual icing conditions only if the VCA is certified and equipped to operate in such conditions.
- (c) If actual icing exceeds the intensity of icing for which the aircraft is certified, or if an aircraft not certified for flight in known icing conditions encounters icing, the PIC shall exit the icing conditions without delay and, if necessary, declare an emergency to ATS.

UAM.OP.VCA.260 Oil supply

Where applicable, the PIC shall commence a flight, or continue in the event of in-flight replanning, only when satisfied that the VCA carries at least the planned amount of oil to complete the flight safely, taking into account expected operating conditions.

UAM.OP.VCA.265 Take-off conditions

Before commencing take-off, the PIC shall be satisfied that:

- (a) the meteorological conditions at the vertiport, diversion location or operating site and the condition of the surface for take-off intended to be used will not prevent the PIC from conducting a safe take-off and departure; and
- (b) the established operating minima for the vertiport, diversion location or operating site, as applicable, will be complied with.

UAM.OP.VCA.270 Minimum flight altitudes

The PIC shall not fly below specified minimum flight altitudes except:

- (a) when it is necessary for taking off or landing; or
- (b) when descending in accordance with procedures approved by the competent authority.

UAM.OP.VCA.275 Simulated abnormal or emergency situations in flight

When carrying passengers or cargo, the PIC shall not simulate abnormal or emergency situations that require the application of abnormal or emergency procedures.

UAM.OP.VCA.290 Proximity detection

When undue proximity to the ground and/or obstacles located horizontally in relation to the VCA is detected by the PIC or by a proximity warning system, the PIC shall immediately take corrective action to establish safe flight conditions.

UAM.OP.VCA.300 Approach and landing conditions

Before commencing an approach operation, the PIC shall be satisfied that:

- (a) the meteorological conditions at the vertiport, diversion location or operating site will not prevent the PIC from conducting a safe approach, landing or go-around, considering the performance information contained in the operations manual (OM); and
- (b) the established vertiport operating minima, or visibility and distance from cloud minima for flights conducted in accordance with VFR by day, shall be complied with.

UAM.OP.VCA.315 Flight hours — reporting

The VCA operator shall make available to the competent authority the amount of hours flown for each VCA operated during the previous calendar year.

SECTION 2

Manned VTOL-capable aircraft (MVCA)

UAM.OP.MVCA.050 Scope

This Section establishes additional requirements for operations with manned VTOL-capable aircraft (MVCA).

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

The VCA operator shall ensure that:

- (a) ATS appropriate to the airspace in which the operation is conducted and to the applicable rules of the air are used, whenever available;
- (b) in-flight operational instructions involving a change to the ATS flight plan are coordinated with the appropriate ATS unit before transmission to the VCA;
- (c) search and rescue service arrangements can be maintained whenever the use of ATS in the airspace in which the operation is conducted is not mandated for VFR flights by day;
- (d) for operations in airspace designated by the competent authority as U-space airspace and not provided with air traffic control (ATC) services by an air navigation service provider (ANSP), the VCA continuously makes itself electronically conspicuous to U-space service providers.

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

- (a) The VCA operator shall use adequate vertiports for its normal operations and for the purpose of diversion.
- (b) The VCA operator shall use one or more adequate diversion locations for diversion only if the method for its/their selection is approved by the competent authority of the VCA operator.
- (c) A vertiport is considered adequate if at the expected time of use it is:
 - (1) compatible with the dimensions and weight of the VCA;
 - (2) compatible with the VCA approach and departure paths;

- (3) provided with rescue and firefighting services (RFFS) and other services and facilities necessary for the intended operation; and
- (4) available.
- (d) A diversion location is considered adequate if at the expected time of use:
 - (1) its characteristics, including dimensions, obstacles, and surface condition, are compatible with the VCA and allow for landing in accordance with an approved landing profile;
 - (2) it can be reached within the CMP of the VCA taking wind limitations into account;
 - (3) it has an acceptable level of RFFS protection;
 - (4) it is pre-surveyed; and
 - (5) it is available.

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

- (a) The VCA operator shall establish visibility minima and distance from cloud minima for flights to be conducted in accordance with VFR by day. These minima shall not be lower than those specified in point SERA.5001 of the Annex (Part-SERA) to Regulation (EU) No 923/2012 for the airspace class being flown, except when permitted to operate as a special VFR flight.
- (b) Where necessary, the VCA operator may specify in the OM additional conditions for the applicability of such minima taking into account factors such as radio coverage, terrain, nature of sites, flight conditions and ATS capacity.
- (c) The flights shall be conducted with the surface in sight.

UAM.OP.MVCA.127 Take-off and landing — VFR flights by day

- (a) When conducting a flight in accordance with VFR by day, the PIC should not take off or land at a vertiport or diversion location unless the reported weather conditions at that vertiport or diversion location are equal to or better than those specified in point SERA.5001 or point SERA.5005 of the Annex (Part-SERA) to Regulation (EU) No 923/2012 for the airspace class being flown.
- (b) When the reported weather conditions are below those required for take-off, a take-off shall be commenced only if the PIC can determine that the visibility and distance from cloud minima along the take-off area are equal to or better than the required minimum.
- (c) When no reported weather conditions are available, a take-off shall be commenced only if the PIC can determine that the visibility and distance from cloud minima along the take-off area are equal to or better than the required minimum.

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

- (a) SCPs shall be carried on board under such conditions that ensure the safety of the VCA and its occupants according to procedures established by the VCA operator.
- (b) SCPs shall not be allocated to, nor occupy, seats that permit direct access to emergency exits or where their presence could:
 - (1) impede crew members' duties;
 - (2) obstruct access to emergency equipment; or

- (3) impede the emergency evacuation of passengers.
- (c) The PIC shall be notified in advance when SCPs are to be carried on board.

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

The VCA operator shall establish procedures to ensure that:

- (a) only baggage that can be appropriately and securely stowed is taken into the passenger compartment; and
- (b) all baggage and cargo on board the aircraft which might cause injury or damage, or obstruct aisles and exits if displaced, is stowed to prevent them from moving.

UAM.OP.MVCA.165 Passenger seating

With regard to potential emergency evacuation, the VCA operator shall establish procedures for passenger seating to ensure that passengers are seated where they will be able to assist the evacuation, and not impede it.

UAM.OP.MVCA.170 Passenger briefing

The VCA operator shall ensure that passengers are:

- (a) given safety briefings and safety demonstrations in a manner that facilitates the execution of the applicable procedures in the event of an emergency; and
- (b) provided with safety briefing material on which picture-type instructions indicate the operation of emergency equipment and emergency exits likely to be used by passengers.

UAM.OP.MVCA.175 Flight preparation

- (a) An operational flight plan (OFP) shall be completed for each intended flight, taking into account the airspace in which the flight is to be conducted and the applicable rules of the air, aircraft performance, operating limitations, and relevant expected conditions along the route to be flown and at the vertiport or diversion location to be used.
- (b) The flight shall not be commenced unless the PIC is satisfied that:
 - (1) all items stipulated in point 2.c of Annex V to Regulation (EU) 2018/1139 concerning the airworthiness and registration of the aircraft, instrument and equipment, mass and centre of gravity (CG) location, baggage and cargo, and aircraft operating limitations can be complied with;
 - (2) the aircraft is not operated against the requirements of the configuration deviation list (CDL);
 - (3) the parts of the operations manual (OM) that are required for the conduct of the planned flight are available;
 - (4) the documents, additional information and forms required to be available by point IAM.GEN.MVCA.110 are on board, unless permitted to be kept on the ground in accordance with point IAM.GEN.MVCA.115;
 - (5) current maps, charts and associated documentation or equivalent data are available for the intended operation of the aircraft, including any diversion that may reasonably be expected;

- (6) space-based facilities, ground facilities and services that are required for the planned flight are available and adequate;
- (7) the applicable requirements specified in the OM in respect of fuel/energy, oil, oxygen, minimum flight altitudes, vertiport operating minima, visibility and distance from cloud minima for VFR flights by day and the selection of adequate vertiports and diversion locations can be complied with for the planned flight;
- (8) RESERVED;
- (9) any additional operational limitations can be complied with;
- (10) any load carried is properly distributed and safely secured;
- (11) an air traffic service (ATS) flight plan has been approved and flight clearance has been granted in accordance with the applicable rules of the air and the class(es) of airspace in which the operation will be conducted.

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

- (a) The VCA operator shall submit an ATS flight plan as required by the applicable rules of the air for the class(es) of airspace in which the operation will be conducted.
- (b) If the submission of an ATS flight plan is not required by the applicable rules of the air for the class(es) of airspace in which the operation will be conducted, the VCA operator shall ensure that adequate information is deposited with the appropriate ATS unit to permit alerting services to be activated if necessary.
- (c) If the submission of an ATS flight plan is required but it is impossible to submit it from the site where the operation starts, the ATS flight plan shall be transmitted as soon as possible after take-off by the PIC or the VCA operator.

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

- (a) The PIC shall select and specify in the operational flight plan and, if so required, in the ATS flight plan, for normal operations, including training, and for the purpose of diversion:
 - (1) at least two safe landing options at the destination, which may be reached from the point of commitment for landing; and
 - (2) one or more vertiports or diversion locations to ensure safe landing in case a diversion is necessary following a CFP at any moment during the flight.
- (b) For the purpose of selecting vertiports and diversion locations in accordance with point (a), the PIC shall consider whether:
 - (1) the actual and forecast weather conditions indicate that at the estimated time of use the conditions at the selected vertiports and diversion locations will be at or above the applicable minima established in accordance with point UAM.OP.MVCA.111;
 - (2) the CMP of the VCA allows for safe landing at the selected vertiports or diversion locations;
 - (3) any required additional operational approvals are held.
- (c) The PIC shall apply appropriate safety margins to flight planning to take possible deterioration of the meteorological conditions into account at the estimated time of landing compared to the available forecast.

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

The PIC shall commit to land at one of the safe landing options in accordance with point UAM.OP.MVCA.192, when the current assessment of the meteorological conditions, traffic, and other operational conditions indicate that a safe landing can be performed at the committed landing site at the estimated time of use.

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

- (a) Special refuelling or defuelling shall be performed only if the VCA operator has:
 - (1) developed standard operating procedures on the basis of a risk assessment; and
 - (2) established a training programme for its personnel involved in such operations.
- (b) Special refuelling or defuelling applies to:
 - (1) refuelling with lift/thrust units powered on and/or rotors powered on;
 - (2) refuelling/defuelling with passengers embarking, on board, or disembarking; and
 - (3) refuelling/defuelling with wide-cut fuel.
- (c) Refuelling procedures with rotors powered on, and any change to those procedures, shall require the prior approval of the competent authority.

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

- (a) The charging or swapping of VCA batteries while passengers embark, are on board, or disembark shall be performed only if the operator has:
 - (1) developed standard operating procedures on the basis of a risk assessment; and
 - (2) established a training programme for its personnel involved in such operations.

UAM.OP.MVCA.216 Use of headsets

- (a) Each pilot required to be on duty at their assigned station shall wear a headset with boom microphone or equivalent. The headset shall be used as the primary device for voice communications with ATS units.
- (b) The position of the boom microphone or equivalent in the cockpit shall allow its use for two-way radio communications when the VCA is taxiing under its own power and whenever deemed necessary by the PIC.

UAM.OP.MVCA.220 Emergency evacuation assisting means

The VCA operator shall establish procedures to ensure that before taxiing or ground movement, take-off and landing, and when safe and practicable to do so, all emergency evacuation assisting means that deploy automatically are armed.

UAM.OP.MVCA.225 Seats, safety belts and restraint systems

(a) *Pilots*

During take-off and landing, and whenever deemed necessary by the PIC in the interest of safety, each pilot shall be properly secured by all safety belts and restraint systems provided on their seats.

(b) *Passengers*

- (1) Before take-off and landing, and during taxiing or ground movement, and whenever deemed necessary in the interest of safety, the PIC shall be satisfied that each passenger on board occupies a seat with their safety belt or restraint system properly secured.
- (2) The VCA operator shall make provisions for multiple occupancy of aircraft seats that is only allowed on specified seats. The PIC shall be satisfied that aircraft seats are not used for multiple occupancy other than by one adult and one infant, with the latter being properly secured by a supplementary loop belt or other restraint device.

UAM.OP.MVCA.230 Securing of passenger compartment

- (a) The VCA operator shall establish procedures to ensure that before taxiing or ground movement, take-off and landing, all exits and escape paths are unobstructed.
- (b) The PIC shall ensure that before take-off and landing, and whenever deemed necessary in the interest of safety, all equipment and baggage is properly stowed and secured.

UAM.OP.MVCA.235 Life jackets

The VCA operator shall establish procedures to ensure that, when operating a VCA over water, the duration of the flight and the conditions to be encountered during the flight are duly considered when deciding whether life jackets are to be worn by all aircraft occupants.

UAM.OP.MVCA.240 Smoking on board

The PIC shall not allow smoking on board at any time.

UAM.OP.MVCA.245 Meteorological conditions

(a) The PIC shall:

- (1) commence the flight; or
- (2) if applicable, continue beyond the point from which a revised ATS flight plan applies in the event of in-flight replanning;
- (3) continue towards the planned destination vertiport,

only when the current meteorological reports or a combination of current reports and forecasts indicate that the expected meteorological conditions at the departure vertiport, along the route to be flown, and at the destination vertiport, at the time of arrival, are at or above the planning minima established in accordance with point UAM.OP. MVCA.111.

UAM.OP.MVCA.285 Use of supplemental oxygen

The PIC shall ensure that all pilots engaged in the performance of duties essential to the safe operation of the VCA during flight use supplemental oxygen continuously whenever the cabin altitude exceeds 10 000 ft for a period of more than 30 minutes and whenever the cabin altitude exceeds 13 000 ft.

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

The VCA operator shall establish operational procedures and training programmes when an ACAS is installed and serviceable so that the flight crew is appropriately trained in the avoidance of collisions and competent in the use of ACAS II equipment.

SUBPART C

VTOL-CAPABLE AIRCRAFT (VCA) PERFORMANCE AND OPERATING LIMITATIONS

UAM.POL.VCA.050 Scope

This Subpart establishes performance requirements and operating limitations for VTOL-capable aircraft (VCA) operations.

UAM.POL.VCA.100 Type of operation

VCA shall be operated in accordance with the applicable performance requirements for the intended type of operation to be conducted.

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

VCA shall be operated in accordance with the certified performance data and limitations contained in the AFM.

UAM.POL.VCA.110 General performance requirements

- (a) The mass of the VCA:
 - (1) at the start of the take-off; or
 - (2) in the event of in-flight replanning, at the point from which the revised operational flight plan applies

shall not be greater than the mass at which the requirements of this Subpart can be complied with for the flight to be conducted, considering expected reductions in mass as the flight proceeds and such fuel jettisoning as applicable.

- (b) The approved performance data contained in the AFM shall be used to determine compliance with the requirements of this Subpart, supplemented as necessary with other data as prescribed in the relevant requirement. The VCA operator shall specify such other data in the operations manual (OM). When applying the factors prescribed in this Subpart, any operational factors already incorporated in the performance data contained in the AFM shall be considered to avoid double application of factors.

- (c) When showing compliance with the requirements of this Subpart, the following parameters shall be taken into account:
- (1) the mass of the VCA;
 - (2) the configuration of the VCA;
 - (3) the environmental conditions, in particular:
 - (i) density altitude;
 - (ii) wind:
 - (A) except as provided in point (C), for take-off, take-off flight path and landing, the correction for wind shall not be more than 50 % of any reported steady headwind component of 5 kt or greater;
 - (B) when take-off and landing with a tailwind component is permitted in the AFM, and in all cases for the take-off flight path, the correction for tailwind shall not be less than 150 % of any reported wind component;
 - (C) when precise wind-measuring equipment enables the accurate measurement of wind velocity over the point of take-off and landing, wind components in excess of 50 % may be taken into account by the VCA operator, provided that the VCA operator demonstrates to the competent authority that the proximity to the FATO and accuracy enhancements of the wind-measuring equipment provide an equivalent level of safety;
 - (4) the operating techniques; and
 - (5) the operation of any systems that have an adverse effect on the VCA performance.

UAM.POL.VCA.115 Obstacle accountability

For operations to/from final approach and take-off areas (FATO), the VCA operator shall, during pre-flight planning and for the purpose of obstacle-clearance calculations:

- (a) consider an obstacle located beyond the FATO, in the take-off flight path or the missed approach flight path, if its lateral distance to the nearest point on the surface below the intended flight path is not farther than the following:
 - (1) for flights to be conducted in accordance with VFR:
 - (i) $0,75 \times D$, where D is the diameter of the smallest circle enclosing the VCA projection on a horizontal plane, while the aircraft is in the take-off or landing configuration, with rotor(s) turning, if applicable;
 - (ii) plus the greater of $0,25 \times D$ or '3 m';
 - (iii) plus:
 - (A) $0,10 \times \text{distance DR}$ for operations under VFR by day; or
 - (B) RESERVED;

- (b) consider an obstacle located in the backup or lateral transition area for take-offs using a backup or a lateral transition procedure, if its lateral distance from the nearest point on the surface below the intended flight path is not farther than:
 - (1) $0,75 \times D$;
 - (2) plus the greater of $0,25 \times D$ or '3 m';
 - (3) plus:
 - (i) $0,10 \times$ distance DR for operations under VFR by day; or
 - (ii) RESERVED;
- (c) disregard obstacles situated beyond the FATO in the take-off flight path or the missed approach flight path if their lateral distance to the nearest point on the surface below the intended flight path is farther than the following:
 - (1) $3 \times D$ for VFR day operations if it is assured that navigational accuracy can be achieved by reference to suitable visual cues during the climb;
 - (2) RESERVED.

UAM.POL.VCA.120 Take-off

- (a) The take-off mass of the VCA shall not exceed the maximum take-off mass specified in the AFM for the certified take-off procedure or procedures to be used.
- (b) The VCA operator shall take into account:
 - (1) the appropriate parameters of point UAM.POL.VCA.110(c); and
 - (2) the obstacles identified in accordance with point UAM.POL.VCA.115.
- (c) In addition, for VCA operations from a FATO:
 - (1) the take-off mass shall be such that:
 - (i) it is possible to reject the take-off and land on the FATO if a CFP has been recognised at or before the take-off decision point (TDP);
 - (ii) the rejected take-off distance required (RTODRV) does not exceed the rejected take-off distance available (RTODAV); and
 - (iii) the TODRV does not exceed the TODAV, unless the VCA with a CFP recognised at or before the TDP can, when continuing the take-off, clear all obstacles to the end of the TODRV by a vertical margin of not less than 10.7 m (35 ft).
 - (2) That part of the take-off up to and including TDP shall be conducted in sight of the surface such that a rejected take-off can be conducted safely.
- (d) For take-offs using a backup or lateral transition procedure, with a CFP recognised at or before the TDP, all obstacles in the backup or lateral transition area shall be cleared by an adequate margin.

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

- (a) From the end of the take-off distance required for VCA (TODRV), following a CFP being recognised at or after the take-off decision point (TDP):

- (1) the take-off mass shall be such that the take-off flight path provides vertical clearance, above all obstacles located in the climb path, of not less than 10,7 m (35 ft) for operations under VFR by day;
 - (2) when a change of direction of more than 15° is made, allowance shall be made for the ability to maintain the climb gradient to comply with the obstacle-clearance requirements in accordance with the AFM; this change of direction is not to be initiated before reaching a height of 61 m (200 ft) above the take-off surface unless it is part of an approved take-off procedure in the AFM.
- (b) When showing compliance with point (a), the relevant parameters of point UAM.POL.VCA.110(c) shall be considered at the vertiport, diversion location or operating site of departure.

UAM.POL.VCA.130 En route

- (a) The mass of the VCA and the flight path at all points along the route following a critical failure for performance (CFP), and taking into account the meteorological conditions expected for the flight, shall permit compliance with the following:
- (1) RESERVED.
 - (2) RESERVED.
 - (3) The mass of the VCA shall permit its operation at or above the minimum level established in accordance with point SERA.5005(f) of the Annex (Part-SERA) to Regulation (EU) No 923/2012 and a descent from the cruising altitude to the landing decision point (LDP) above the vertiport, diversion location or operating site where the landing can be conducted in accordance with point UAM.POL.VCA.135.
- (b) When showing compliance with point (a), all the following shall apply:
- (1) the CFP is assumed to occur at the most critical point along the route;
 - (2) the effects of winds on the flight path are considered;
 - (3) fuel jettisoning, if applicable, is planned to be performed only to an extent consistent with reaching the vertiport, diversion location or operating site with the required fuel/energy reserves and using a safe procedure; and
 - (4) fuel jettisoning, if applicable, is not planned below 300 m (1 000 ft) above terrain.

UAM.POL.VCA.135 Landing

- (a) The landing mass of the VCA at the estimated time of landing shall not exceed the maximum mass specified in the AFM for the certified landing procedure to be used.
- (b) The VCA operator shall take into account:
- (1) the relevant parameters of point UAM.POL.VCA.110(c); and
 - (2) the obstacles identified in accordance with point UAM.POL.VCA.115.
- (c) If a critical failure for performance (CFP) is recognised at any point at or before the landing decision point (LDP), it is possible either to land and stop within the runway or FATO, or perform a balked landing by clearing all obstacles in the flight path by a vertical margin of 10,7 m (35 ft).

- (d) If a CFP is recognised at any point at or after the LDP, it is possible to land and stop within the runway or FATO by clearing all obstacles in the approach path.

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

- (a) During any phase of the operation, the loading, mass, and centre of gravity (CG) of the VCA shall comply with the limitations specified in the AFM, or the operations manual (OM), if more restrictive.
- (b) The VCA operator shall establish the mass and the CG of any aircraft it operates by actual weighing prior to initial entry into service and thereafter at intervals of 4 years if individual VCA masses are used, or at intervals of 9 years if fleet masses are used. The accumulated effects of modifications and repairs on the mass and balance of the aircraft shall be considered and properly documented. The VCA shall be reweighed if the effect of modifications on its mass and balance is not accurately known.
- (c) The weighing shall be accomplished by the manufacturer of the aircraft or by an approved maintenance organisation.
- (d) The VCA operator shall determine the mass of all operating items and crew members (pilots and, if applicable, technical crew), included in the VCA dry operating mass, by actual weighing or by using standard masses. The influence of their position on the aircraft's CG shall be determined.
- (e) The VCA operator shall establish the mass of the traffic load, including any ballast, by actual weighing or by determining the mass of the traffic load in accordance with standard passenger and, if applicable, baggage masses.
- (f) The VCA operator can use standard masses for other load items if it demonstrates to the competent authority that these items have the same mass or that their masses are within specified tolerances.
- (g) The VCA operator shall determine the mass of the fuel load and/or of the energy storage unit as follows:
- (1) for the *fuel load*, by using the actual density or, if not known, the density calculated in accordance with a method specified in the operations manual (OM);
 - (2) for the *energy storage unit*, by weighing or by using standard masses specified in the OM.
- (h) The VCA operator shall ensure that the loading of:
- (1) the VCA is performed under the supervision of qualified personnel; and
 - (2) the traffic load is consistent with the data used for the calculation of the aircraft mass and balance.
- (i) The VCA operator shall comply with additional structural limits such as the floor strength limitations, the maximum load per running metre, the maximum mass per cargo compartment, and the maximum seating limit.
- (j) The VCA operator shall specify in the OM the principles and methods applied for the loading and in the mass and balance system that meet the requirements of points (a) to (i). That system shall cover all types of the operator's intended operations.

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

- (a) The VCA operator shall establish mass and balance data and shall produce mass and balance documentation prior to each flight, specifying the load and its distribution. The mass and balance documentation shall enable the PIC to determine that the load and its distribution is such that the mass and balance limits of the aircraft are not exceeded. The mass and balance documentation shall contain the following information:
- (1) VCA registration and type;
 - (2) flight identification, number and date;
 - (3) full name of the PIC;
 - (4) full name of the person that has prepared the documentation;
 - (5) dry operating mass and the corresponding CG of the aircraft;
 - (6) mass of the fuel or energy storage unit at take-off, and the mass of trip fuel;
 - (7) mass of consumables other than fuel, if applicable;
 - (8) traffic load components, including passengers, baggage, freight and ballast;
 - (9) take-off mass, landing mass, and zero fuel mass;
 - (10) applicable aircraft CG positions; and
 - (11) the limiting mass and CG values.
- The information above shall be available in flight-planning documents or in mass and balance systems.
- (b) When mass and balance data and mass and balance documentation are generated by a computerised mass and balance system, the operator shall:
- (1) verify the integrity of the output data to ensure that the data is within the AFM limitations; and
 - (2) specify the instructions and procedures for its use in its operations manual (OM).
- (c) The person that supervises the loading of the aircraft shall confirm by handwritten signature or equivalent that the load and its distribution are in accordance with the mass and balance documentation given to the PIC. The PIC shall indicate their acceptance by handwritten signature or equivalent.
- (d) The VCA operator shall specify procedures for last-minute changes to the load to ensure that:
- (1) any last-minute change following the completion of the mass and balance documentation is brought to the attention of the PIC and entered in the flight-planning documents containing the mass and balance documentation;
 - (2) the maximum last-minute change allowed in passenger numbers or hold load is specified; and
 - (3) new mass and balance documentation is prepared if the maximum passenger number is exceeded.

SUBPART D

INSTRUMENTS, DATA AND EQUIPMENT

SECTION 1

VTOL-capable aircraft (VCA)

UAM.IDE.VCA.050 Scope

This Section establishes the requirements for operations with VTOL-capable aircraft (VCA).

UAM.IDE.VCA.100 Instruments and equipment

- (a) The instruments, data and equipment required by this Subpart, as well as by the type-certification requirements and airspace requirements, shall be installed on or carried in the VCA according to the conditions under which the operation is to be conducted.

Instruments and equipment required by this Subpart, as well as by the type-certification requirements and airspace requirements, shall be approved in accordance with the applicable airworthiness requirements, except for the following items:

- (1) first-aid kits;
 - (2) survival and signalling equipment;
 - (3) sea anchors and equipment for mooring; and
 - (4) child restraint devices.
- (b) Instruments and equipment not required by this Annex, as well as any other equipment which is not required pursuant to this Regulation, but carried on a flight, shall comply with the following:
- (1) the information provided by these instruments, equipment or accessories shall not be used by the pilot to comply with Annex II and with point 2.1 of Annex IX to Regulation (EU) 2018/1139 or with points UAM.IDE.MVCA.330, UAM.IDE.MVCA.335 and UAM.IDE.MVCA.345 of this Annex; and
 - (2) the instruments and equipment shall not affect the airworthiness of the aircraft, even in the case of failure or malfunction.
- (c) If equipment is to be used by the pilot at their assigned station during the flight, it shall be installed so as to be easily operable from that station. When a single item of equipment is to be used by more than one person at their assigned stations, it shall be installed so as to be readily operable from any station.
- (d) Those instruments that are used by the pilot shall be so arranged as to permit the pilot to see the indications readily from their assigned station with the minimum practicable deviation from the position and line of vision that the pilot normally assumes when looking forward along the flight path.
- (e) All required emergency equipment shall be easily accessible for immediate use.

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

A flight shall not commence when any of the aircraft instruments, items of equipment or functions required for the intended flight are inoperative or missing, unless:

- (a) the aircraft is operated in accordance with the operator's minimum equipment list (MEL); or
- (b) the operator is approved by the competent authority to operate the aircraft within the constraints of the master minimum equipment list (MMEL) in accordance with point ORO.MLR.105(j) of Annex III.

SECTION 2

Manned VTOL-capable aircraft (MVCA)

UAM.IDE.MVCA.050 Scope

This Section establishes additional requirements for the operation of manned VTOL-capable aircraft (MVCA).

UAM.IDE.MVCA.115 Operating lights

A VCA operated under VFR by day shall be equipped with anti-collision lights.

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

- (a) The VCA shall be equipped with the flight instruments and equipment specified in its type-certification approval for flights to be conducted in accordance with VFR by day.
- (b) Additional flight instruments and equipment shall be installed on or carried in the VCA, as necessary, according to the expected operating conditions and crew workload.

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

- (a) The VCA shall be equipped with means of measuring and displaying to the pilot in flight the remaining usable amount of fuel/energy.
- (b) A conservative estimate of the amount of fuel/energy necessary to complete the remaining part of the flight shall be displayed to the pilot in flight unless provided by other means as per point UAM.OP.VCA.195(a).

UAM.IDE.MVCA.145 Height-determination equipment

- (a) The VCA shall, for flights over water, be equipped with a means to determine the height of the aircraft in relation to the water surface, capable of emitting an audio warning below a preset value and a visual warning at a height selectable by the pilot, when operating:
 - (1) at a distance from land corresponding to more than 3 minutes flying time at normal cruising speed;
 - (2) RESERVED;
 - (3) RESERVED;

- (4) out of sight of the land.

UAM.IDE.MVCA.170 Crew interphone system

For operations with more than one crew member, the VCA shall be equipped with an interphone system, including headsets and microphones, for use by all the crew members.

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

The VCA shall be equipped with a PAS, unless:

- (a) the aircraft is designed without a bulkhead between the pilot and the passengers; and
- (b) the VCA operator is able to demonstrate that when in flight, the pilot's voice is audible and intelligible at all passengers' seats.

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

- (a) A VCA with an MCTOM of more than 5 700 kg shall be equipped with a CVR.
- (b) The CVR shall be capable of retaining the data recorded during at least the preceding 2 hours.
- (c) The CVR shall record with reference to a timescale on means other than magnetic tape or magnetic wire:
 - (1) voice communications transmitted from or received in the flight crew compartment by radio;
 - (2) crew members' voice communications using the interphone system and the public address system (PAS), if installed;
 - (3) the aural environment of the flight crew compartment, including the audio signals received from the flight crew microphone;
 - (4) voice or audio signals identifying navigation or approach aids introduced into a headset or a speaker.
- (d) The CVR shall, depending on the availability of electrical power, record as early as possible during the cockpit checks at the beginning of the flight prior to the VCA being capable of moving under its own power until the cockpit checks immediately following lift/thrust units powering off at the end of the flight. In any case, the CVR shall automatically start to record prior to the aircraft moving under its own power and shall continue to record until the termination of the flight.
- (e) A function to modify CVR recordings shall be at the disposal of the PIC so that recordings made prior to the operation of that function cannot be retrieved using normal replay or copying techniques.
- (f) If the CVR is not deployable, it shall have a device to assist in locating it under water with a minimum underwater transmission time of 90 days. If the CVR is deployable, it shall have an automatic emergency locator transmitter (ELT).

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

- (a) A VCA with an MCTOM of more than 5 700 kg shall be equipped with a FDR that uses a digital method of recording and storing data, and for which a method of readily retrieving that data from the storage medium is available.

- (b) The FDR shall record the parameters required to determine accurately the flight path, speed, attitude, engine(s) power, operation, configuration, and any parameter that has been established during the type certification of the VCA and shall be capable of retaining the data recorded during at least the preceding 25 hours.
- (c) Data shall be obtained from the VCA sources that enable accurate correlation with information displayed to the pilot(s).
- (d) The FDR shall automatically start to record the data not later than the VCA is capable of moving under its own power and shall stop automatically following lift/thrust units powering off at the end of the flight.
- (e) If the FDR is not deployable, it shall have a device to assist in locating it under water with a minimum underwater transmission time of 90 days. If the FDR is deployable, it shall have an automatic ELT.

UAM.IDE.MVCA.191 Flight recorder

- (a) A VCA with an MCTOM of 5 700 kg or less shall be equipped with a flight recorder.
- (b) The flight recorder shall record by means of flight data and/or images information that is sufficient to determine the flight path and aircraft speed, as well as:
 - (1) audio from the flight crew compartment in multi-crew and VEMS operations; or
 - (2) radio communications with air traffic service (ATS) units, where applicable.
- (c) The flight recorder shall be capable of retaining the flight data and/or images, as well as audio, recorded during at least the preceding 5 hours.
- (d) The flight recorder shall automatically start to record prior to the VCA being capable of moving under its own power and shall stop automatically following lift/thrust units powering off at the end of the flight.
- (e) If the flight recorder records images or audio of the flight crew compartment, a function to modify image and audio recordings shall be at the disposal of the PIC, so that the recordings made prior to the operation of that function cannot be retrieved using normal replay or copying techniques.
- (f) As an alternative to points (b) and (c), some flight data, images or audio may be transmitted and recorded remotely if approved as part of the aircraft type certification.

UAM.IDE.MVCA.200 Flight data and cockpit voice combination recorder

Compliance with the CVR and FDR requirements may be achieved by the carriage of one combination recorder.

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

- (a) The VCA shall be equipped with:
 - (1) a seat or berth for each person on board that is aged 24 months or older;
 - (2) a seat belt with an upper-torso restraint system for use on each passenger seat and restraining belts on each berth;
 - (3) a child restraint device (CRD) for each person on board that is younger than 24 months; and

- (4) a four-point upper-torso restraint system that includes a seat belt with two shoulder straps, on each pilot seat.
- (b) A seat belt with upper-torso restraint system shall:
 - (1) have a single-point release; and
 - (2) on the pilot seat, incorporate a device that will automatically restrain the occupant's torso in the event of rapid deceleration.

UAM.IDE.MVCA.210 ‘FASTEN SEAT BELT’ and ‘NO SMOKING’ signs

The VCA shall be equipped with a means of indicating to all persons on board when seat belts shall be fastened, and that smoking is not allowed at any time.

UAM.IDE.MVCA.220 First-aid kits

- (a) The VCA shall be equipped with at least one first-aid kit.
- (b) First-aid kits shall be:
 - (1) readily accessible for use;
 - (2) kept up to date.

UAM.IDE.MVCA.240 Supplemental oxygen — non-pressurised aircraft

Non-pressurised VCA operated at pressure altitudes above 10 000 ft shall be equipped with supplemental oxygen equipment capable of storing and dispensing oxygen in accordance with the following table:

Table — Minimum requirements regarding supplemental oxygen in non-pressurised aircraft

<i>Supply for:</i>	<i>Flight duration and cabin pressure altitude</i>
person(s) piloting the aircraft	For the entire flying time at pressure altitudes above 13 000 ft and for any period that exceeds 30 minutes at pressure altitudes above 10 000 ft but not exceeding 13 000 ft.
100 % of passengers ⁽¹⁾	For the entire flying time at pressure altitudes above 13 000 ft.
10 % of passengers ⁽¹⁾	For the entire flying time beyond 30 minutes at pressure altitudes above 10 000 ft but not exceeding 13 000 ft.
⁽¹⁾ Passenger percentages in this table refer to passengers carried on board, including persons younger than 24 months of age.	

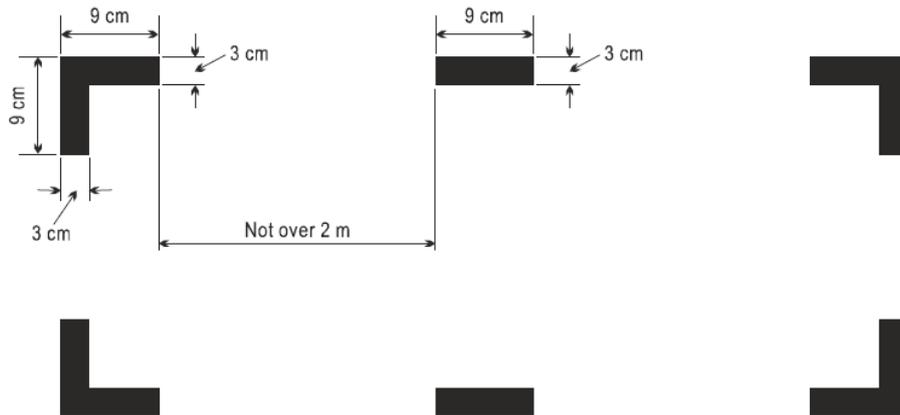
UAM.IDE.MVCA.250 Handheld fire extinguishers

- (a) The VCA shall be equipped with at least one handheld fire extinguisher in the flight crew compartment, which shall be readily accessible for use.
- (b) At least one handheld fire extinguisher shall be located in the passenger compartment if the handheld fire extinguisher located in the flight crew compartment cannot be easily accessed by the passengers.

- (c) The type and quantity of the fire-extinguishing agent of the handheld fire extinguishers shall be suitable for the type of fire likely to occur in the compartment where the handheld fire extinguisher is intended to be used and to minimise the hazard of toxic gas concentration in compartments occupied by persons.

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

If areas on the VCA's fuselage that are suitable for break-in by rescue crews in an emergency are marked, such areas shall be marked as shown in the figure below.



UAM.IDE.MVCA.275 Emergency lighting and marking

The VCA shall be equipped with:

- (a) an emergency lighting system to provide a source of general cabin illumination to facilitate the evacuation of passengers from the aircraft; and
- (b) emergency-exit marking and locating signs visible in daylight or in the dark.

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

The VCA shall be equipped (fitted) with at least one approved automatic ELT or, alternatively, with such other approved automatic aircraft tracking device in combination with a locator beacon that shall enable rescue services to be alerted, to reach the accident site and to accurately locate survivors.

UAM.IDE.MVCA.300 Flights over water

- (a) A VCA that carries passengers shall be certified:
 - (1) for ditching, when operated over water in a hostile sea at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed;
 - (2) for ditching or emergency flotation, when operated over water in a non-hostile sea at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed;
 - (3) for limited overwater operations, if not meeting the criteria referred to in point (a)(1) or (a)(2), and when one or more of the following conditions apply:
 - (i) the total flying time over water is longer than 3 minutes;

- (ii) the landing or take-off is performed on water.
- (b) A VCA that does not carry passengers shall be certified:
 - (1) for ditching or emergency flotation, when operated over water at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed;
 - (2) for limited overwater operations, if not meeting the criteria referred to in point (b)(1) and when one or more of the following conditions apply:
 - (i) the total flying time over water is longer than 3 minutes;
 - (ii) the landing or take-off is performed on water.
- (c) A VCA that operates on water shall be certified for operations on water in addition to meeting the criteria referred to in point (a) or (b).
- (d) A VCA that operates on floating surfaces shall be certified for operations on floating surfaces in addition to meeting the criteria referred to in point (a) or (b).
- (e) The VCA shall carry a survival ELT (ELT(S)) that is buoyant and can be automatically activated for flights over water, except for limited overwater operations.

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

- (a) Except as specified in point (c) for flights over water as defined in point UAM.IDE.MVCA.300, the VCA shall be equipped as a minimum with a life jacket for each person on board, stowed in a position that is readily accessible from the seat or berth of the person for whose use it is provided, with the restrain system fastened. If it is not possible to have the life jackets readily accessible with the restrain system fastened, each person shall wear a life jacket on or, if that person is younger than 24 months, an equivalent flotation device.
- (b) Each life jacket or equivalent individual flotation device shall be equipped with a means of electric illumination for the purpose of facilitating the location of persons in the water.
- (c) For flights over water in a hostile sea area at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed, for the purpose of support to activities related to non-renewable and renewable-energy sources and support to vessels:
 - (1) each person on board shall wear a life jacket during the entire operation unless integrated survival suits that meet the combined requirement of the survival suit and life jacket are worn;
 - (2) each person on board shall wear a survival suit as appropriate with regard to the water temperature and estimated rescue time; the level of insulation provided shall be sufficient for the prevailing conditions and not excessive;
 - (3) each person on board shall carry an emergency breathing system (EBS) and shall be instructed in its use.

UAM.IDE.MVCA.310 Life rafts

- (a) The VCA shall have one or more life rafts installed on board for flights over water in a hostile sea area at a distance from land corresponding to more than 10 minutes flying time at normal cruising speed or shall carry at least one life raft stowed so as to facilitate its ready use in an emergency for flights over water in a non-hostile sea at a distance from land corresponding to more than 10

minutes flying time at normal cruising speed. The life rafts shall have sufficient capacity, separately or together, to accommodate all persons carried on board the VCA.

- (b) All life rafts installed or carried on board shall allow for their ready use in an emergency.
- (c) Each life raft shall contain at least one ELT(S).
- (d) Each life raft installed or carried on board shall be usable in the sea conditions in which the VCA's ditching, flotation, and trim characteristics have been evaluated for the purpose of certification.
- (e) Each life raft shall contain life-saving equipment, including means of sustaining life, as appropriate to the flight to be undertaken.

UAM.IDE.MVCA.311 Survival equipment

- (a) A VCA operated over areas where search and rescue would be particularly difficult shall be equipped with:
 - (1) signalling equipment to make distress signals;
 - (2) at least one ELT(S); and
 - (3) additional survival equipment for the route to be flown taking into account the number of persons on board.

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

- (a) A VCA certified for operating on water shall be equipped with:
 - (1) a sea anchor and other equipment necessary to facilitate mooring, anchoring or manoeuvring the VCA on water, appropriate to its size, weight and handling characteristics; and
 - (2) equipment for making the sound signals prescribed in the International Regulations for Preventing Collisions at Sea, where applicable.

UAM.IDE.MVCA.325 Headsets

The VCA shall be equipped with a headset with boom microphone or equivalent and a transmit button on the flight controls for each pilot of the VCA at their assigned station.

UAM.IDE.MVCA.330 Radio communication equipment

- (a) The VCA shall be equipped with at least one radio communication system connected to the aircraft's primary power supply and as many more radio communication systems as necessary for the type of operation to be conducted and the class(es) of airspace in which the operation shall take place.
- (b) The radio communication equipment shall allow flight crews under normal operating conditions to:
 - (1) communicate with appropriate ground stations from any point on the route, including diversions;
 - (2) communicate with appropriate ATC stations from any point in controlled airspace within which flights are intended to be operated; and
 - (3) receive meteorological information.

- (c) The radio communication equipment shall allow for communication on the 121,5 MHz aeronautical emergency frequency.

UAM.IDE.MVCA.345 Navigation equipment

- (a) The VCA shall be equipped with navigation equipment for flights in accordance with VFR by day and in accordance with the applicable airspace requirements.
- (b) The VCA shall be equipped with sufficient navigation equipment to ensure that, in the event of failure of one item of equipment at any phase of the flight, the remaining equipment shall allow for safe navigation in accordance with the flight plan.

UAM.IDE.MVCA.350 Transponders

When required by the class of airspace being flown, the VCA operated under VFR by day shall be equipped with a secondary surveillance radar (SSR) transponder with all the required capabilities.

UAM.IDE.MVCA.355 Management of aeronautical databases

- (a) The VCA operator shall:
 - (1) ensure that the aeronautical databases to be used on certified aircraft system applications meet the data quality requirements that are adequate for the intended use of the data;
 - (2) ensure the timely distribution and update of current and unaltered aeronautical databases to all aircraft that require them;
 - (3) report to the database provider instances of erroneous, inconsistent or missing data that might be reasonably expected to constitute a hazard to flight, notwithstanding any other occurrence-reporting requirements as defined in Regulation (EU) No 376/2014. In such cases, the VCA operator shall inform all personnel concerned, and shall ensure that the affected data is not used.’.