Civil Aviation AUTHORITY

CAR-AAM.SB

Civil Aviation Regulation

Advanced Air Mobility Sandbox

Effective: 03 November 2026

Approved by H.E. Eng. Naif Ali Hamed Al-Abri

President of CAA

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CORRIGENDUM OF AMENDMENTS

Edition No.	Applicability date	Description
01	10 November 2026	First issue of the Advanced Air Mobility Sandbox Regulation, including Appendix 1 (Entry, Governance and Approval Toolkit, forms F1-01 to F1-13), Appendix 2 Parts A and B (mandatory), the minimum content of Appendices 3 to 10, and Appendix 11 (Model Sandbox Approval). Forms aligned with Form AWR-033 Issue 2 and the AUTHORITY procedures manual CAA-SOP-AAM.

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FOREWORD

(a) This Civil Aviation Regulation, CAR-AAM.SB – Advanced Air Mobility Sandbox Regulation, is issued by the Civil Aviation Authority of the Sultanate of Oman (hereinafter "the CAA" or "the AUTHORITY") under the provisions of the Civil Aviation Law promulgated by Royal Decree No. 76/2019.

(b) Advanced Air Mobility (AAM) introduces electric and hybrid vertical take-off and landing (VTOL) aircraft, advanced Remotely Piloted Aircraft Systems (RPAS), highly automated aircraft and supporting UTM and digital services operating in close proximity to people, infrastructure and conventional air traffic. If not subject to an appropriate regulatory framework and effective oversight, these concepts may create unacceptable risks to aviation safety, third parties and critical infrastructure, and may affect the orderly and efficient use of the airspace of the Sultanate of Oman.

(c) This Regulation establishes a time-limited and scope-limited AAM Sandbox in which such concepts may be trialled under enhanced safety oversight, performance monitoring and time-bound authorisations, so that the State can gain the evidence needed for permanent regulation. It supports Oman Vision 2040 and the AUTHORITY's National Aviation Strategy 2040 (NAS 2040). Safety and security take precedence over economic and innovation objectives in every decision taken under this Regulation.

(d) The AUTHORITY implements this Regulation as part of the State Safety Programme (SSP) and the National Aviation Safety Plan (NASP), consistent with ICAO Annex 19 and the Global Aviation Safety Plan (GASP).

(e) In applying this Regulation, the AUTHORITY takes into account:

(1) all relevant Civil Aviation Regulations, decisions and instructions of the AUTHORITY, as listed in CAR-AAM.SB.020;

(2) ICAO Annexes 1, 3, 6, 7, 8, 9, 10, 11, 12, 13, 14 (Volume II), 15, 16, 17, 18 and 19, the associated Procedures for Air Navigation Services and ICAO guidance material relevant to RPAS, UTM and AAM;

(3) the Specific Operations Risk Assessment (SORA): JARUS SORA 2.5 (Main Body JAR-DEL-SRM-SORA-MB-2.5 of 13 May 2024 and its annexes) or the corresponding EASA AMC edition (ED Decision 2025/018/R), applied without mixing editions, or a later edition accepted by the AUTHORITY; and

(4) as non-binding reference, regulations, specifications and guidance issued by the European Union Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA), to the extent consistent with the Civil Aviation Law and the policies of the AUTHORITY.

(f) Material issued by other States or organisations applies in the Sultanate of Oman only where this Regulation, its AMC or a Sandbox Approval expressly provides so.

(g) The AUTHORITY shall not permit any AAM operation to be conducted under the AAM Sandbox unless the operator holds a Sandbox Approval and has demonstrated, to the satisfaction of the AUTHORITY, that its Concept of Operations and safety case are robust and proportionate, that its safety, security and cybersecurity arrangements are effective, that its aircraft, operations, infrastructure and service arrangements comply with this Regulation, and that effective coordination exists with all relevant stakeholders.

(h) This Regulation is one of three instruments in the AUTHORITY's regulatory methodology for AAM: CAR 102 and CAA Decision No. 1412/2023 continue to govern routine unmanned aircraft operations; this Regulation provides a temporary, supervised framework for novel operations and builds the capability of the AUTHORITY and its partners; and CAR-AAM, drafted in parallel on the EASA-based baseline and informed by the evidence gathered under this Regulation, is intended, subject to the rulemaking procedure of CAR 11, to replace CAR 102 and provide the permanent framework into which successful Sandbox Projects transition (CAR-AAM.SB.657). Operations that are demanding but conventional, such as BVLOS operations of conventional unmanned aircraft, are authorised under CAR 102 with conditions derived from the SORA (Form AWR-033, Route B) and do not require a Sandbox Approval. All applications, including applications for a Sandbox Approval, are made on Form AWR-033.

(i) The editing practices used in this document are as follows:

(1) "Shall" indicates a mandatory requirement and appears only in rule text.

(2) "Will" indicates a mandatory action incumbent on the AUTHORITY.

(3) "Should" indicates an Acceptable Means of Compliance (AMC). AMC is one means, but not the only means, of complying with a rule.

(4) "May" indicates discretion by the AUTHORITY or by industry, as appropriate.

(5) Guidance Material (GM) explains the intent of a requirement and does not create obligations.

Note: The use of the male gender in this Regulation shall be interpreted to include the female gender and vice versa.

DEFINITIONS AND ABBREVIATIONS

(a) Terms defined in CAR 1 – Definitions and Abbreviations and in CAR 13 have the same meaning in this Regulation unless defined below. The definitions below are established by CAR-AAM.SB.001A.

(b) For the purposes of this Regulation, the following definitions apply:

AAM Aircraft

Any aircraft, including eVTOL, VTOL-capable aircraft and unmanned aircraft, used in a Sandbox operation, together with its remote pilot station, C2 Link equipment and other systems necessary for its safe operation.

AAM Landing Site

A location other than a certified aerodrome runway, including a rooftop, pad or temporary area, approved by the AUTHORITY for the take-off and landing of AAM Aircraft.

Accountable Manager

The person having corporate authority to ensure that all Sandbox activities can be financed and carried out in accordance with this Regulation.

Advanced Air Mobility (AAM)

Air transport concepts and technologies, including eVTOL aircraft, advanced RPAS, highly automated aircraft and associated UTM and digital services, intended to provide new or enhanced carriage of passengers, cargo or other missions.

AAM Sandbox

The time-limited, scope-limited framework established by this Regulation within which Sandbox Projects are conducted under enhanced oversight.

Alternative Means of Compliance (AltMoC)

A means of compliance other than the AMC published by the AUTHORITY, proposed by an applicant and approved by the AUTHORITY in accordance with CAR-AAM.SB.115.

Automation Level

The degree to which functions of an AAM Aircraft or of its operation are performed without human intervention, classified in accordance with CAR-AAM.SB.280.

Form AWR-033

The application form of the AUTHORITY for the operational authorisation of unmanned aircraft and AAM operations, Issue 2 or later, with its Guidance Manual. Applications for a Sandbox Approval are made on Route C of the form.

C2 Link

The data link between the AAM Aircraft and the remote pilot station used for the purpose of managing the flight.

C2 Link Service Provider (C2 CSP)

An entity providing all or part of a C2 Link as a service.

CAR-AAM

The permanent Civil Aviation Regulation on Advanced Air Mobility established by the AUTHORITY, and its Parts, as applicable from time to time. References to CAR-AAM apply only once and to the extent that the Part concerned is applicable.

Change

Any modification to a Sandbox Project, including its organisation, aircraft, systems, software, infrastructure, procedures, service providers or operating environment. Changes are classified as follows: (1) Minor Change – a change with no effect on the risk assessment, interfaces or approval conditions, managed under the Sandbox Operator's approved procedure and recorded; (2) Notifiable

Change – a change that may affect risk or interfaces but remains within the approved conditions and limitations, notified to the AUTHORITY before implementation; (3) Major Change – a change that may invalidate the basis of the Sandbox Approval, requires a revised safety case or materially changes the CONOPS or ODD, and requires prior approval by the AUTHORITY.

Close-Out Report

The report required by CAR-AAM.SB.610.

Complexity Level

The level (L1, L2 or L3) assigned by the AUTHORITY to a Sandbox Project in accordance with CAR-AAM.SB.157.

Concept of Operations (CONOPS)

A structured description of how a proposed AAM operation will be conducted, including actors and roles, operational environment, airspace and infrastructure, operational scenarios, risk management, contingency and emergency procedures, and phasing.

Contingency Procedure

A pre-planned procedure applied when conditions deviate from normal but before an emergency exists, with the aim of maintaining or restoring safe operations.

Dangerous Goods

Articles or substances classified as such in ICAO Annex 18 and the ICAO Technical Instructions for the Safe Transport of Dangerous Goods by Air (Doc 9284).

Decision-Maker

The official of the AUTHORITY designated under CAR-AAM.SB.100(b)(2) to issue, amend, limit, suspend or revoke Sandbox Approvals and to authorise phases and EIS.

Degraded Mode

An operational condition in which one or more functions, systems or services are partially unavailable or degraded, but in which operations may continue under defined conditions and procedures.

Digital Service Provider (DSP)

An organisation providing digital or data-based services that support Sandbox operations, such as UTM, tracking, mission management, weather, mapping or data analytics.

Emergency Procedure

A pre-planned procedure applied when a serious, imminent or actual threat to safety exists, requiring immediate action to protect persons, property or the environment.

Entry into Service (EIS)

Any of the activities listed in CAR-AAM.SB.170(b).

Final Reserve Energy

The usable energy that remains on landing, required under CAR-AAM.SB.330, and that shall not be planned to be used except in an emergency.

Ground Risk Buffer

The area surrounding the Operational Volume in which additional mitigations are applied to manage risk to third parties on the ground.

Inter-Agency Readiness Statement

The statement issued under CAR-AAM.SB.125(c).

Operational Control

The exercise of authority over the initiation, continuation, diversion or termination of a flight or mission.

Operational Design Domain (ODD)

The operating conditions under which an AAM Aircraft, a system or an automated function is designed to function safely, including environmental, geographical, time-of-day, traffic and infrastructure conditions.

Operational Readiness

The demonstrated capability of the aircraft, operator, infrastructure, ANS and UTM interfaces, emergency response, cybersecurity, digital services and community measures to support the intended phase safely within the approved operating envelope.

Operational Volume

The three-dimensional airspace within which the operation is intended to be contained under normal conditions, comprising the flight geography and the contingency volume.

Operations Control Centre (OCC)

The physical or virtual facility from which Operational Control, monitoring and coordination of Sandbox operations are exercised.

Phase Gate

The decision point at which the AUTHORITY decides whether a Sandbox Project may enter its next phase.

Programme Coordination Office

An entity designated or recognised by the AUTHORITY under CAR-AAM.SB.127 to coordinate the scheduling, shared resources, logistics and airspace activation requests of a Sandbox Programme, without any regulatory function and without Operational Control.

Regulatory Learning Plan

The plan established by the AUTHORITY under CAR-AAM.SB.100(b)(11) identifying the regulatory questions the AAM Sandbox is to answer for each Part of CAR-AAM.

Residual Risk

The risk remaining after mitigations have been applied.

Safety Case

A documented, structured argument, supported by evidence, that the risks of a Sandbox Project are identified and controlled to an acceptable level.

Safety Data and Safety Information

As defined in ICAO Annex 19.

Sandbox Approval

The certificate issued by the AUTHORITY under CAR-AAM.SB.165, in the format of Appendix 11, specifying the scope, conditions, limitations, phases and validity of a Sandbox Project.

Sandbox Flight Permit

A permit issued under CAR-AAM.SB.252 for an AAM Aircraft that does not hold a type certificate or a validated type certificate.

Sandbox Operator

The single legal entity that holds a Sandbox Approval and is accountable for all Sandbox operations within its scope, including those performed by consortium members or contractors.

Sandbox Operations Team (SOT)

The CAA team established under CAR-AAM.SB.110.

Sandbox Programme

A group of related Sandbox Projects established by the AUTHORITY, alone or with other public bodies, under a common theme, geographical area or timeframe.

Sandbox Project

A specific AAM initiative conducted under a Sandbox Approval, with its own CONOPS, safety case, phasing plan, scope, conditions and duration.

Sandbox Technical Team (TT)

The CAA team established under CAR-AAM.SB.105.

Shared OCC Facility

A physical or virtual facility used by more than one Sandbox Operator, or by a Programme Coordination Office, to host OCC functions and coordination with ATS, USSPs, meteorological and emergency services, in accordance with CAR-AAM.SB.305(f).

SORA terms

Ground Risk Class (GRC), Air Risk Class (ARC), Specific Assurance and Integrity Level (SAIL) and Operational Safety Objective (OSO) have the meaning given in the edition of SORA used under CAR-AAM.SB.205(a).

Stop Condition

An objective, pre-defined trigger requiring the Sandbox Operator to restrict or suspend affected operations in accordance with CAR-AAM.SB.175.

Target CAR-AAM Category

The category of operation and the instrument under CAR-AAM into which a Sandbox Project is expected to transition, recorded under CAR-AAM.SB.157(e).

Unmanned Aircraft Systems Traffic Management (UTM)

The set of services, procedures and information exchanges that support safe, efficient and orderly operations of unmanned and AAM aircraft and their coordination with air traffic management. The term "U-space" refers to the European Union implementation of UTM and is used in this Regulation only by way of reference.

UTM Service Provider (USSP)

An entity designated by the AUTHORITY in accordance with CAR-AAM.SB.405 to provide UTM services.

Vertiport

An aerodrome, or a defined area on or off an aerodrome, used or intended to be used for the arrival, departure and surface movement of VTOL-capable aircraft, including passenger and cargo processing.

Vertiport / Landing Site Operator

The organisation responsible for the operation and safety of a vertiport or AAM Landing Site.

(c) For the purposes of this Regulation, the following abbreviations apply:

AAMAdvanced Air Mobility ADS-B Automatic Dependent Surveillance – Broadcast AIP Aeronautical Information Publication AIS Aeronautical Information Service AltMoC Alternative Means of Compliance AMC Acceptable Means of Compliance ANS Air Navigation Services ANSP Air Navigation Service Provider ARC Air Risk Class (SORA) ATC Air Traffic Control ATM Air Traffic Management ATS Air Traffic Services BVLOS Beyond Visual Line of Sight C2 Command and Control CAA Civil Aviation Authority CAR Civil Aviation Regulation CBTA Competency-Based Training and Assessment CNS Communication, Navigation and Surveillance CONOPS Concept of Operations CSP Communication Service Provider DAA Detect and Avoid DG Dangerous Goods DGMET Directorate General of Meteorology DSP Digital Service Provider

DSP	Digital Service Provider
EASA	European Union Aviation Safety Agency
EIS	Entry into Service
eVTOL	electric Vertical Take-Off and Landing

FAA	Federal Aviation Administration (United States)
FATO	Final Approach and Take-Off Area
GASP	Global Aviation Safety Plan
GM	Guidance Material
GNSS	Global Navigation Satellite System
GRC	Ground Risk Class (SORA)
ICAO	International Civil Aviation Organization
ICD	Interface Control Document
JARUS	Joint Authorities for Rulemaking on Unmanned Systems
KPI	Key Performance Indicator
LOA	Letter of Agreement
MEL	Minimum Equipment List
NAS 2040	National Aviation Strategy 2040
NASP	National Aviation Safety Plan
NCASP	National Civil Aviation Security Programme
NOTAM	Notice to Airmen
OCC	Operations Control Centre
ODD	Operational Design Domain
OSO	Operational Safety Objective (SORA)
PBO	Performance-Based Oversight
PCO	Programme Coordination Office
PDPL	Personal Data Protection Law (Royal Decree No. 6/2022)
RPAS	Remotely Piloted Aircraft System
SAIL	Specific Assurance and Integrity Level (SORA)
SARPs	Standards and Recommended Practices (ICAO)
SMS	Safety Management System
SORA	Specific Operations Risk Assessment
SOT	Sandbox Operations Team (CAA)
SPI	Safety Performance Indicator
SSP	State Safety Programme
TLOF	Touchdown and Lift-Off Area
TT	Sandbox Technical Team (CAA)
USSP	UTM Service Provider
UTM	Unmanned Aircraft Systems Traffic Management
VLOS	Visual Line of Sight
VMC	Visual Meteorological Conditions
VTOL	Vertical Take-Off and Landing

SUBPART A – GENERAL FRAMEWORK

CAR-AAM.SB.001 Title and Citation

(a) This Regulation may be cited as CAR-AAM.SB – Advanced Air Mobility Sandbox Regulation.

(b) CAR-AAM.SB forms part of the Civil Aviation Regulations issued by the AUTHORITY under the Civil Aviation Law promulgated by Royal Decree No. 76/2019.

(c) This Regulation shall be read together with its associated Acceptable Means of Compliance (AMC) and Guidance Material (GM), which the AUTHORITY may issue, amend or withdraw in accordance with CAR-AAM.SB.675(d).

GM1 CAR-AAM.SB.001 – Reference Framework

(a) The overall context and policy intent of this Regulation are set out in the Foreword, including its link to:

(1) Oman Vision 2040;

(2) the National Aviation Strategy 2040 (NAS 2040), in particular the Advanced Air Mobility (AAM) and UTM initiatives.

(b) In case of doubt as to the intent of a provision in this Regulation, reference should be made to:

(1) the Foreword to CAR-AAM.SB; and

(2) the relevant AAM- and UTM-related initiatives in NAS 2040 as approved by the competent State authorities.

CAR-AAM.SB.001A Definitions

(a) The definitions and abbreviations set out under "Definitions and Abbreviations" at the beginning of this Regulation form part of this rule.

(b) Unless otherwise specified in this Regulation, the definitions and abbreviations contained in CAR 1 and CAR 13 apply.

CAR-AAM.SB.005 Purpose and Objectives

(a) This Regulation establishes a controlled, time-limited and scope-limited AAM Sandbox within which innovative AAM concepts may be trialled under enhanced safety, security, environmental and performance oversight.

(b) The objectives of this Regulation are to:

(1) enable the safe, secure and orderly development and trial of AAM operations in the Sultanate of Oman, including passenger, cargo, public service and other use cases;

(2) ensure that risks to aviation safety, aviation security, third parties, critical infrastructure and the environment arising from such operations are identified, assessed and controlled to an acceptable level;

(3) support the implementation of Oman Vision 2040 and NAS 2040 by fostering innovation in the aviation and logistics sectors, encouraging participation of the private sector including small and medium enterprises, and contributing to economic diversification and job creation;

(4) generate evidence to inform permanent rulemaking, airspace design, UTM development, infrastructure planning and strategic decisions; and

(5) provide a defined pathway for successful Sandbox Projects to transition to permanent regulatory frameworks.

(c) This Regulation does not replace or reduce any requirement of other Civil Aviation Regulations, except where this Regulation expressly so provides or an exemption is granted under CAR-AAM.SB.670.

AMC1 CAR-AAM.SB.005 – Alignment with National Strategies

(a) When establishing, approving or amending AAM Sandbox projects under this Regulation, the AUTHORITY should, as far as practicable, ensure alignment with:

(1) Oman Vision 2040 pillars and priorities relevant to mobility, logistics, innovation and sustainability;

(2) NAS 2040 objectives and initiatives relating to AAM, UTM, digitalization and airport/vertiport development; and

(3) the State's safety, security and environmental objectives and programmes.

(b) In deciding whether to support a proposed Sandbox project, the AUTHORITY should consider, in addition to safety and security, the extent to which the project:

(1) improves connectivity, accessibility or service quality;

(2) promotes innovation and technology transfer in the aviation ecosystem of Oman;

(3) supports Omanisation and local capability development; and

(4) has a credible potential to generate sustainable economic or social benefits for the State.

GM1 CAR-AAM.SB.005 – Examples of AAM Sandbox Use Cases

(a) Without limiting the scope of CAR-AAM.SB.005, typical Sandbox use cases may include:

(1) Leisure and non-urban commercial operations, such as sightseeing flights, remote tourism, photography and surveying in low-density areas;

(2) Urban or peri-urban parcel and light cargo delivery, such as last-mile logistics between distribution centers, hospitals, ports and urban depots;

(3) Passenger-carrying eVTOL services, such as airport–city connections or point-to-point links between urban hubs or tourism locations;

(4) Heavy cargo or specialized missions, such as logistics for remote sites, offshore installations or large payload missions; and

(5) Public service and emergency operations, such as medical transport, search and rescue support, firefighting and disaster relief.

(b) The inclusion of a particular use case in a Sandbox project does not imply that such operation will be authorized on a permanent basis outside the Sandbox. Permanent authorizations may require separate regulatory development and approvals under other CARs.

CAR-AAM.SB.010 Scope and Applicability

(a) This Regulation applies to:

(1) AAM operations conducted under a Sandbox Approval;

(2) applicants for, and holders of, a Sandbox Approval;

(3) AAM Aircraft used in Sandbox operations;

(4) vertiport and AAM Landing Site operators whose facilities are used in Sandbox operations;

(5) ANSPs, USSPs and C2 CSPs supporting Sandbox operations;

(6) DSPs whose services are identified as safety-critical in a Sandbox Approval; and

(7) Programme Coordination Offices designated or recognised under CAR-AAM.SB.127.

(b) This Regulation does not apply to:

(1) operations conducted solely under CAR 101, CAR 102 or, once applicable, CAR-AAM, under CAA Decision No. 1412/2023 or under other CARs, without a Sandbox Approval;

(2) State aircraft operations; or

(3) operations which the AUTHORITY has determined in writing to fall outside the AAM Sandbox, having regard to their novelty, their risk profile and the adequacy of existing CARs.

(c) An AAM operation that is novel within the meaning of AMC1 CAR-AAM.SB.010 shall not be conducted in the Sultanate of Oman except under a Sandbox Approval or another authorisation issued by the AUTHORITY.

(d) A foreign organisation may apply for a Sandbox Approval only through a legal entity registered in the Sultanate of Oman, which shall act as the Sandbox Operator. Operations of foreign-registered AAM Aircraft are subject to Article 8 of the Convention on International Civil Aviation, where applicable, and to CAR-AAM.SB.245(d).

AMC1 CAR-AAM.SB.010 – Applicability Clarification

(a) When assessing whether an activity should be brought under this Regulation, the AUTHORITY should consider, in particular:

(1) the degree of novelty or innovation of the concept, aircraft, operation or business model;

(2) the extent to which existing CARs already provide an adequate regulatory framework;

(3) the level and nature of the risks to safety, security, the environment or the public; and

(4) the potential value of the activity in terms of learning, data and experience for future regulatory development.

(b) As a general principle:

(1) conventional operations already fully covered by existing CARs should normally not be brought into the Sandbox;

(2) operations that are experimental, highly automated, or which involve new forms of airspace usage, vertiports or UTM paradigms should be considered for the Sandbox, subject to risk assessment and policy considerations; and

(3) operations that can be authorised under the open or specific category of CAR-AAM, once applicable, including under a standard scenario or a pre-defined risk assessment, should normally not be brought into the Sandbox.

GM1 CAR-AAM.SB.010 – Examples of Operations Inside/Outside the Sandbox

(a) Examples of operations typically inside the Sandbox include:

(1) initial deployment of passenger-carrying eVTOL services between an airport and a city vertiport;

(2) urban parcel delivery using BVLOS drones in complex airspace with UTM integration;

(3) heavy cargo AAM operations to remote or offshore locations using highly automated platforms;

(4) large-scale medical delivery or emergency response networks using AAM aircraft.

(b) Examples of operations typically outside the Sandbox (subject to other CARs) include:

(1) small recreational drones operated in accordance with CAR 101 and CAR 102, within line-of-sight and low-risk environments;

(2) standard helicopter operations already covered by existing air operator regulations and CAR 139/CAR 180;

(3) routine aerial work with conventional aircraft where no innovative AAM element is involved.

(c) The above examples are indicative only. The AUTHORITY retains the discretion to decide on a case-by-case basis whether a proposed operation should be conducted under this Regulation.

GM2 CAR-AAM.SB.010 – State Aircraft Operations in or near Sandbox Areas

State aircraft operations, including police, customs and military operations, are outside the scope of this Regulation under CAR-AAM.SB.010(b)(2), even where they take place in or near a Sandbox operating area. Such operations

should be shown in Sandbox governance arrangements as coordinated activities, not as Sandbox Projects, and should be deconflicted from Sandbox Operational Volumes through the arrangements of CAR-AAM.SB.120 and CAR-AAM.SB.400(d), including segregation where required.

GM3 CAR-AAM.SB.010 – Which Regulation Applies

(a) To determine whether a proposed operation requires a Sandbox Approval, the following questions should be answered in order:

(1) Is the operation a State aircraft operation? If so, it is outside this Regulation (CAR-AAM.SB.010(b)(2)).

(2) Can the operation be conducted under CAR 101, CAR 102 and CAA Decision No. 1412/2023, including under an approval under CAR 102 with conditions derived from the SORA (Form AWR-033, Route B), or, once applicable, under the open or specific category of CAR-AAM? If so, those instruments apply and no Sandbox Approval is needed.

(3) Is the operation fully covered by another CAR, with no innovative AAM element, such as a standard helicopter operation under the air operations CARs and CAR 139? If so, that CAR applies.

(4) Otherwise, the operation is novel within the meaning of AMC1 CAR-AAM.SB.010 and requires a Sandbox Approval (CAR-AAM.SB.010(c)).

(b) Typical results: recreational and photography drones operated within visual line of sight remain under CAR 102 and, once applicable, the open category of CAR-AAM; urban BVLOS delivery with UTM, passenger-carrying eVTOL services and highly automated cargo operations require a Sandbox Approval.

(c) In case of doubt, the applicant may request a pre-application meeting. The AUTHORITY decides in writing under CAR-AAM.SB.010(b)(3).

(d) The screening questions in Part 0.6 of Form AWR-033 apply these steps. An operation is brought into the Sandbox (Route C) where persons are carried, a Sandbox Flight Permit is needed, the concept depends on an element that cannot be handled as a condition of an approval under CAR 102, or the AUTHORITY directs it for phased supervision or regulatory learning (AWR-033 Guidance Manual, section 2.4).

CAR-AAM.SB.015 Operational Readiness

(a) The AUTHORITY will not authorise any phase of a Sandbox Project, including EIS, unless Operational Readiness for that phase has been demonstrated in accordance with CAR-AAM.SB.165 and, for EIS, CAR-AAM.SB.170.

(b) Operational Readiness shall be demonstrated, as applicable to the operation and phase, in the following domains:

(1) airworthiness and continuing airworthiness;

(2) Operational Control and OCC;

(3) personnel licensing, competence, fitness and fatigue management;

(4) vertiport and landing site readiness, including energy and charging infrastructure;

(5) ANS, UTM and CNS integration, including degraded-mode procedures;

(6) emergency response, rescue and firefighting, and alerting;

(7) aviation security, cybersecurity and DSP readiness; and

(8) community engagement, consumer information and complaint handling.

GM1 CAR-AAM.SB.015 – EIS as a High-Exposure Regulatory Milestone

EIS is a regulatory high-exposure milestone. While the Sandbox may permit controlled testing, EIS requires evidence that system readiness is sufficient to support public exposure and scaling without degrading safety, security or societal acceptance.

CAR-AAM.SB.020 Relationship with Other Civil Aviation Regulations

(a) This Regulation shall be applied together with the following, as applicable:

- CAR 1 – Definitions and Abbreviations;
- CAR 10 – Exemptions;
- CAR 11 – Rulemaking Procedure;
- CAR 12 – Civil Aviation Regulation Enforcement;
- CAR 13 – Aircraft Accident and Incident Investigation and Reporting Procedures, and CAD 01-02;
- CAR 21, CAR 39, CAR 47, CAR 66, CAR 145, CAR 147, CAR-M and CAR-MEL – Airworthiness and Continuing Airworthiness;
- CAR 100 – Safety Management System;
- CAR 101 – Air Recreational Activities;
- CAR 102 – Remotely Piloted Aircraft (Drones);
- CAR-AAM – Advanced Air Mobility, once and to the extent applicable;
- CAR 139 – Aerodrome Certification, Design and Operation;
- CAR 171 to CAR 179 – Air Navigation Services;
- CAR 180 – Rules of the Air, including Appendix 4 – RPAS;
- CAA Decision No. 1412/2023 on unmanned aircraft (drones);
- the National Civil Aviation Security Programme (NCASP);
- the national civil aviation facilitation programme;
- Administrative Decision No. 994/2025 on the National Airspace Planning Committee, for changes to airspace structures; and
- the Personal Data Protection Law promulgated by Royal Decree No. 6/2022.

(b) Where a matter is regulated both by this Regulation and by another CAR, the more specific or more stringent provision applies, unless the AUTHORITY grants an exemption in accordance with CAR-AAM.SB.670.

(c) The Civil Aviation Law prevails over any CAR. Subject to the Civil Aviation Law, the interpretation principles in CAR 1 and CAR 11 apply. Any unresolved conflict shall be referred to the AUTHORITY, whose written interpretation is binding for the Sandbox Project concerned.

(d) The Sandbox Operator shall establish, keep current and make available to the AUTHORITY an Applicability and Compliance Matrix for each phase, which shall:

(1) identify every requirement applicable to the approved CONOPS and ODD, including in the areas of operations, airworthiness, personnel licensing, ANS and UTM, aerodromes and vertiports, aviation security, cybersecurity, dangerous goods, occurrence reporting, environmental protection and consumer protection;

(2) state, for each requirement, the means of compliance: full compliance, AMC, AltMoC, exemption, or not applicable with documented justification;

(3) reference, for each requirement, the supporting evidence, the monitoring method and the reporting frequency used to demonstrate continued compliance; and

(4) identify, for each requirement, the Part of CAR-AAM to which it is expected to correspond, so that the matrix supports conversion under CAR-AAM.SB.657.

(e) The Applicability and Compliance Matrix shall be updated before any Major Change, Phase Gate or EIS Readiness Review, and within 30 days of implementing any Notifiable Change.

AMC1 CAR-AAM.SB.020 – Applicability and Compliance Matrix

(a) The Applicability and Compliance Matrix should be established as a controlled document and updated without undue delay whenever, as applicable:

(1) the CONOPS and/or ODD is introduced, amended or re-scoped;

(2) the operating area, airspace class, operational volume/corridor, or exposure level changes;

(3) the aircraft configuration, software/firmware baseline, autonomy functions, C2 link architecture, or other safety-critical design elements change;

(4) the UTM/ANS service model, interface control documentation (ICD), LOAs, or digital service provider (DSP) dependencies change; or

(5) the Sandbox Project progresses to a subsequent phase, or an EIS Readiness Review is initiated.

(b) The Applicability and Compliance Matrix should constitute the primary reference used by the AUTHORITY (TT/SOT), as applicable, for:

(1) surveillance planning and oversight prioritization;

(2) classification of changes (Minor / Notifiable / Major) and determination of approval pathways; and

(3) phase gate decisions, including the definition of operational limitations, enhanced monitoring requirements and stop conditions.

GM1 CAR-AAM.SB.020 – Purpose of the Applicability and Compliance Matrix

The Applicability and Compliance Matrix is intended to prevent compliance drift, ensure traceability across phases and support transparent consultation by linking requirements, means of compliance and evidence. It is the AUTHORITY's primary reference for surveillance planning, change classification and Phase Gate decisions.

AMC2 CAR-AAM.SB.020 – Interface with Other CARs

(a) When preparing guidance, procedures and approvals under this Regulation, the AUTHORITY and Sandbox Operators should:

(1) clearly identify which requirements stem from CAR-AAM.SB and which from other CARs;

(2) avoid unnecessary duplication of requirements; and

(3) ensure that any use of exemptions or deviations under CAR 10 is justified, documented and does not reduce the overall level of safety, security or environmental protection.

(b) The AUTHORITY should consider issuing cross-reference tables or consolidated checklists to help Operators and inspectors understand how CAR-AAM.SB interacts with other CARs in the areas of airworthiness, operations, vertiports, ANS/UTM, safety management and enforcement.

GM2 CAR-AAM.SB.020 – Regulatory Hierarchy and Conflict Resolution

(a) In case of conflict or apparent inconsistency between this Regulation and another provision of the Civil Aviation Regulations:

(1) the Civil Aviation Law (CAL) prevails over any CAR;

(2) subject to the CAL, the general interpretation principles and hierarchy set out in CAR 1 and CAR 11 should be followed; and

(3) any doubts or conflicts should be referred to the AUTHORITY for clarification.

(b) The AUTHORITY may publish interpretative material or Q&A documents to clarify how CAR-AAM.SB should be applied in conjunction with other CARs.

GM3 CAR-AAM.SB.020 – Relationship with ICAO RPAS Provisions

(a) The ICAO Standards for remotely piloted aircraft systems in Annexes 1, 2 and 8 applicable from 26 November 2026, and in Annex 6 Part IV applicable from 21 November 2030 (Amendment 1, State letter AN 11/61.1.1-

26/32), are implemented through the relevant CARs, including CAR 180 Appendix 4, and not through this Regulation.

(b) This Regulation does not provide a means of deviating from an ICAO Standard. Any difference is notified in accordance with CAR 11 and Article 38 of the Convention on International Civil Aviation (see CAR-AAM.SB.670(b)).

GM4 CAR-AAM.SB.020 – Determining the Applicable Provision

(a) A provision is 'more specific' where it addresses the activity, aircraft or operation of the Sandbox Project more directly than the general CAR, considering its scope and intent. It is 'more stringent' where it provides a higher level of protection against the risk concerned.

(b) For AAM Aircraft operated under a Sandbox Flight Permit or a design verification or declaration (CAR-AAM.SB.250(c)(3) and (4)), CAR-AAM.SB.250 to CAR-AAM.SB.255 are the more specific provisions for airworthiness and continuing airworthiness. The other CARs listed in CAR-AAM.SB.020(a) apply to the extent identified in the accepted Applicability and Compliance Matrix.

(c) The provisions of CAR 172 to CAR 180 on air traffic services, airspace and rules of the air continue to apply in full, unless an exemption is granted under CAR-AAM.SB.670.

(d) In case of doubt, the AUTHORITY determines the applicable provision and records it in the Applicability and Compliance Matrix.

GM5 CAR-AAM.SB.020 – References to ICAO Annexes

Where this Regulation refers to an ICAO Annex, the obligation is met through the CAR implementing that Annex. The Annex is cited as a technical reference.

CAR-AAM.SB.025 Compliance and Enforcement

(a) The holding of a Sandbox Approval does not relieve any person of liability for a contravention of the Civil Aviation Law or of any CAR.

(b) A failure to comply with this Regulation, a Sandbox Approval, a Sandbox Flight Permit or the conditions of an exemption constitutes a contravention subject to CAR 12, without prejudice to action under CAR-AAM.SB.185.

(c) The Sandbox Operator shall grant the AUTHORITY, and any person authorised by it, access at any reasonable time, and without prior notice where safety so requires, to its facilities, AAM Aircraft, OCC, records, data and personnel, including those of its contractors and consortium members.

SUBPART B – AUTHORITY GOVERNANCE, PROCEDURES AND RIGHTS OF REVIEW

CAR-AAM.SB.100 Responsibilities of the AUTHORITY

(a) The AUTHORITY will establish, maintain and oversee the AAM Sandbox as part of the SSP.

(b) In particular, the AUTHORITY will:

(1) define and periodically review the AAM Sandbox policy, priorities, eligibility criteria and the maximum number of concurrent Sandbox Projects it can oversee effectively;

(2) designate the Directorate General accountable for the AAM Sandbox and the decision-maker for Sandbox Approvals;

(3) develop and maintain the procedures, forms, checklists and guidance necessary to implement this Regulation;

(4) process applications and issue, amend, limit, suspend or revoke Sandbox Approvals and Sandbox Flight Permits;

(5) plan and perform risk-based and performance-based oversight;

(6) coordinate with other State entities, the ANSP, vertiport operators and security and emergency services;

(7) include Sandbox safety data, hazards and safety performance indicators in the SSP safety data collection and analysis system and, where relevant, address Sandbox risks in the NASP;

(8) decide on the acceptance of residual risks submitted to it under CAR-AAM.SB.200(c);

(9) capture lessons learned for rulemaking, policy and planning;

(10) ensure that its personnel involved in AAM Sandbox activities have the competence, resources, independence and tools required; and

(11) establish, before the first Sandbox Approval, and maintain a Regulatory Learning Plan identifying the regulatory questions the AAM Sandbox is to answer for each Part of CAR-AAM, the evidence required and the Sandbox Projects expected to provide it.

AMC1 CAR-AAM.SB.100 – Oversight Planning and Performance-Based Oversight

(a) The AUTHORITY should establish an AAM Sandbox Oversight Plan that:

(1) identifies all Sandbox projects and associated Operators, aircraft, sites and service providers subject to oversight;

(2) defines the oversight strategy and methods (inspections, audits, document reviews, data monitoring, meetings, tests, demonstrations, etc.); and

(3) is proportionate to the complexity, scale and risk of each Sandbox project.

(b) The Oversight Plan should be based on performance-based oversight (PBO) principles, taking into account, inter alia:

(1) the robustness of the Operator's safety and security management arrangements;

(2) the nature of the environment (e.g. urban vs non-urban, sensitive areas, critical infrastructure);

(3) the maturity of the AAM concept, aircraft and supporting systems; and

(4) the Operator's past performance, including occurrence history, compliance record and responsiveness to oversight findings.

(c) The Oversight Plan should be reviewed at least annually, or more frequently where justified by changes in risk, performance or policy.

(d) The Oversight Plan should state, for each Sandbox Project, the minimum number of audits and inspections per phase.

GM1 CAR-AAM.SB.100 – Example Oversight Programme

(a) For a low-complexity Sandbox project (e.g. limited non-urban cargo operation), the Oversight Programme might include:

(1) an initial readiness inspection before first operations;

(2) a limited number of planned inspections during the pilot phase; and

(3) periodic review meetings based on reported performance indicators.

(b) For a higher-complexity Sandbox project (e.g. urban passenger-carrying eVTOL operation), the Oversight Programme might include:

(1) an in-depth review of the safety case and security assessment;

(2) multiple readiness reviews and demonstrations before each phase;

(3) regular on-site inspections at vertiports and operations control centers;

(4) enhanced monitoring of data streams, occurrences and SPIs; and

(5) structured phase-gate reviews with clearly defined go/no-go criteria.

AMC2 CAR-AAM.SB.100 – Minimum Authority Arrangements before the First Sandbox Approval

(a) Before issuing the first Sandbox Approval, the AUTHORITY should have in place, as a minimum:

(1) the decision designating the Directorate General accountable for the AAM Sandbox and the Decision-Maker under CAR-AAM.SB.100(b)(2);

(2) the Terms of Reference of the TT under AMC1 CAR-AAM.SB.105 and the nomination of its members, together with their conflict of interest declarations under CAR-AAM.SB.105(f);

(3) the nomination of the SOT and a project-specific Surveillance Plan under CAR-AAM.SB.110(c);

(4) the establishment of the Inter-Agency Cell, its Interface Register and its Escalation and Duty Contact Tree (Appendix 1, F1-10);

(5) the risk tolerability matrix and the mandatory list of reportable occurrences of Appendix 2, Parts A and B;

(6) the occurrence reporting channel and the 24/7 duty contact of the AUTHORITY;

(7) the schedule of fees and charges under CAR-AAM.SB.140(a) and the minimum insurance amounts under CAR-AAM.SB.555(b);

(8) where UTM services are required, the designation of a USSP or an interim UTM arrangement under CAR-AAM.SB.405(g);

(9) the public register under CAR-AAM.SB.140(b) and the application tracking record (Appendix 1, F1-13);

(10) the Regulatory Learning Plan under CAR-AAM.SB.100(b)(11); and

(11) the AAM Authorisation and Sandbox Procedures Manual (CAA-SOP-AAM) setting out the internal procedures for each step of GM2 CAR-AAM.SB.100, including the processing of Form AWR-033.

(b) The AAM Sandbox Oversight Handbook under AMC1 CAR-AAM.SB.110 and the AAM Oversight Capability Plan under CAR-AAM.SB.130 may be developed progressively, provided that they are completed before any Complexity Level L3 project or any EIS is authorised.

(c) The AUTHORITY may set the fees for an initial cohort of Sandbox Projects at a reduced or nil level, provided that this is published before the cohort opens.

AMC3 CAR-AAM.SB.100 – Regulatory Learning Plan

(a) The Regulatory Learning Plan should identify, for each Part of CAR-AAM:

(1) the regulatory questions to be answered, such as final reserve energy in high ambient temperatures, operations control centre staffing per aircraft, mitigation of GNSS interference, noise acceptance near housing, downwash limits at elevated sites and UTM service performance;

(2) the evidence needed and its quality;

(3) the Sandbox Projects and phases expected to provide it; and

(4) the date by which the evidence is needed for drafting, in particular for the Mid-Term Review under CAR-AAM.SB.660.

(b) Each Sandbox Approval should list the questions of the Plan that the Sandbox Project addresses (Appendix 11, item 18).

(c) The Plan should be reviewed at each Mid-Term Review and whenever a Sandbox Project is approved, closed or terminated.

GM2 CAR-AAM.SB.100 – End-to-End Sandbox Process

The following table summarises the end-to-end process and the forms that support each step. It does not create additional obligations.

Step	Activity	Responsible	Rule	Form
1	Pre-application meeting (optional) and confirmation that the project falls within the AAM Sandbox	Applicant / TT	SB.010	—
2	Submission of Form AWR-033 (Route C) with the Sandbox Supplement, the Complexity Level self-assessment and the initial Compliance Matrix	Applicant	SB.150, SB.155, SB.157, SB.020(d)	AWR-033, F1-01, F1-03, F1-04
3	Acknowledgement (10 working days), completeness check, eligibility verification and assignment of the Complexity Level	Sandbox Secretariat / TT	SB.135, SB.157	AWR-033 Part J, F1-02, F1-13
4	Technical assessment and, where SB.125(a) applies, Inter-Agency Cell consultation	TT / Inter-Agency Cell	SB.105, SB.125, SB.160	F1-09, F1-10
5	Decision and issue of the Sandbox Approval; entry in the public register	Decision-Maker	SB.160, SB.165, SB.140	F1-11, F1-13, Appendix 11
6	Phase planning, logistics, site preparation and airspace coordination	Sandbox Operator / PCO where established	SB.127, SB.400, SB.405	—
7	Readiness inspection, Phase Gate package and, where required, Inter-Agency Readiness Statement; phase authorisation	SOT / TT / Inter-Agency Cell / Decision-Maker	SB.110, SB.125(c), SB.165(c)-(d)	F1-05, F1-10
8	Flight release and conduct of operations under the Operational Control of the Sandbox Operator; Stop Conditions	Sandbox Operator	SB.175, SB.305	—
9	Occurrence reporting, changes and AltMoC	Sandbox Operator / TT	SB.115, SB.180, SB.215	F1-06, F1-07, F1-08, Appendix 2
10	Periodic reporting, surveillance and six-monthly review meetings	Sandbox Operator / SOT	SB.110, SB.605	—
11	Subsequent Phase Gates and EIS Readiness Review	Sandbox Operator / TT / Decision-Maker	SB.165, SB.170	F1-05
12	Close-Out Report, Sandbox Conversion Annex and wind-down or transition	Sandbox Operator / TT	SB.610, SB.615, SB.655	Appendix 10

The internal procedure for each step, with responsibilities and time limits, is set out in CAA-SOP-AAM (SOP-01 and SOP-04 to SOP-10).

CAR-AAM.SB.105 Sandbox Technical Team (TT)

(a) The AUTHORITY will establish a multidisciplinary Sandbox Technical Team (TT) under the Directorate General designated in accordance with CAR-AAM.SB.100(b)(2).

(b) The TT will include members with suitable competence and experience in: safety regulation and rulemaking; air operations; airworthiness and continuing airworthiness; personnel licensing; ANS, ATM and UTM integration; aerodromes and vertiports; aviation security and cybersecurity; dangerous goods; environmental protection; legal affairs and enforcement; and strategic planning, data and economic analysis.

(c) The TT will:

(1) assess applications, CONOPS, safety cases, security assessments and environmental and socio-economic aspects;

(2) assess the adequacy and proportionality of proposed mitigations and operational limitations;

(3) recommend to the decision-maker the approval, modification or refusal of applications, with proposed conditions, limitations, phases, monitoring requirements and Stop Conditions;

(4) classify and assess changes in accordance with CAR-AAM.SB.180;

(5) review significant findings, occurrences and performance data to identify systemic issues; and

(6) contribute lessons learned and recommendations for rulemaking and policy.

(d) For each application, Phase Gate and Major Change, the TT will produce, as a minimum:

(1) a TT Assessment Report, including recommended conditions and limitations;

(2) an Integrated Risk Summary linked to the Sandbox Operator's hazard and threat register;

(3) an Interface Readiness Statement covering ANSP, ATS, USSP, C2 CSP and DSP dependencies;

(4) a Phase Gate Recommendation (GO, GO with conditions, or NO-GO) with evidence references; and

(5) a Change Classification Record.

(e) Each TT output will reference the evidence relied upon by document identifier, version and date.

(f) Persons who hold, or have held during the Sandbox Programme concerned, a programme management, consultancy, advisory or commercial role in relation to a Sandbox Programme or Sandbox Project will not take part in the TT assessment of, or in any decision on, that Programme or Project. Each TT member will declare any conflict of interest before each assessment, and the declaration will be recorded in the TT Assessment Report.

AMC1 CAR-AAM.SB.105 – Composition and Working Methods of the TT

(a) The AUTHORITY should issue an internal Terms of Reference for the TT that covers, at a minimum:

(1) membership, roles and responsibilities;

(2) appointment and replacement of members;

(3) reporting lines and decision-making arrangements;

(4) meeting frequency and quorum; and

(5) record-keeping and confidentiality arrangements.

(b) The TT should meet:

(1) whenever a new Sandbox application or a major change to an existing Sandbox project requires assessment; and

(2) periodically (e.g. quarterly) to review the status and performance of ongoing Sandbox projects and to identify cross-cutting issues.

(c) TT members should receive appropriate training in AAM concepts, risk assessment methodologies (including SORA), performance-based oversight and relevant national and international guidance.

(d) Where necessary, the TT may be supported by external experts or specialists, provided that potential conflicts of interest are managed in accordance with the AUTHORITY's policies.

GM1 CAR-AAM.SB.105 – Example RACI for the TT

(a) The following is an example of a responsibility assignment (RACI) for the TT:

(1) Application completeness check – Responsible: Sandbox Secretariat; Consulted: TT;

(2) Technical and risk assessment – Responsible: TT; Accountable: Chair of TT;

(3) Recommendation on approval/conditions – Responsible: TT; Accountable: Chair of TT;

(4) Decision and signature of Sandbox Approval – Accountable: designated Director General or other delegated decision-maker;

(5) Monitoring of performance indicators – Responsible: SOT, with TT Consulted for interpretation;

(6) Lessons learned and rulemaking input – Responsible: TT; Consulted: Strategic Planning / rulemaking units.

(b) The precise RACI model may be adapted by the AUTHORITY to fit its internal organization and decision- making structures.

CAR-AAM.SB.110 Sandbox Operations Team (SOT)

(a) The AUTHORITY will establish a Sandbox Operations Team (SOT) composed of inspectors and specialists drawn from air operations, airworthiness, ANS and UTM, aerodromes and vertiports, aviation security and cybersecurity, dangerous goods, and safety management and occurrence reporting.

(b) The SOT will:

(1) conduct readiness inspections, demonstrations and tests before the commencement of each phase;

(2) conduct announced and unannounced inspections and audits of Sandbox Operators' facilities, vertiports, landing sites, OCCs and other relevant locations;

(3) verify compliance with Sandbox Approvals and applicable CARs;

(4) monitor operational data, occurrences and performance indicators in cooperation with the TT;

(5) coordinate with other authorities during the planning and conduct of oversight; and

(6) report findings, follow up corrective actions and recommend limitation or suspension where a Stop Condition or a ground under CAR-AAM.SB.185 is met.

(c) For each Sandbox Project, the SOT will maintain a Surveillance Plan, Readiness Inspection Records, an Occurrence Follow-up Log and a Trend Monitoring Summary.

(d) Oversight decisions will be taken independently of any commercial stakeholder. SOT members will declare and manage any conflict of interest in accordance with CAR-AAM.SB.105(f).

AMC1 CAR-AAM.SB.110 – SOT Planning and Workflow

(a) The AUTHORITY should develop an internal AAM Sandbox Oversight Handbook describing, as a minimum:

(1) how the SOT plans and prioritizes inspections, audits and monitoring activities;

(2) standard checklists and forms for inspections of Operators, vertiports/landing sites, OCCs and UTM/ANS interfaces;

(3) procedures for unannounced inspections where justified by risk or performance concerns; and

(4) coordination arrangements between the SOT, TT and other CAA units.

(b) For each Sandbox project, the SOT should prepare a project-specific oversight plan covering:

(1) the phases of the project and key milestones;

(2) planned inspections and reviews linked to those phases;

(3) triggers for additional oversight activities (e.g. serious occurrences, performance degradation, major changes); and

(4) communication arrangements with the Operator and other stakeholders.

GM1 CAR-AAM.SB.110 – Example Operational Oversight Cycle

(a) A typical operational oversight cycle for a Sandbox project may include:

(1) Pre-phase readiness review – verification of documentation, systems, training and facilities;

(2) Initial supervised operations – closely monitored operations with CAA presence and enhanced reporting;

(3) Routine oversight – periodic inspections and data reviews during stable operation;

(4) Event-driven oversight – targeted inspections or reviews triggered by occurrences, trend deviations or significant changes; and

(5) Phase close-out review – assessment of performance against objectives and conditions before progressing to the next phase.

(b) The intensity and frequency of oversight activities should be commensurate with the risk and complexity of the project, and may be adjusted based on observed performance.

CAR-AAM.SB.115 Means of Compliance

(a) The AUTHORITY may issue AMC establishing means by which compliance with this Regulation can be demonstrated.

(b) An applicant or Sandbox Operator may propose an Alternative Means of Compliance (AltMoC). The proposal shall include a full description of the AltMoC, an assessment demonstrating that the rule is met, and the supporting risk assessment.

(c) An AltMoC shall not be used until it has been approved in writing by the AUTHORITY. The AUTHORITY will keep a record of approved AltMoCs and may make them available to other operators without commercially sensitive detail.

CAR-AAM.SB.120 Coordination with Other Public Authorities and Stakeholders

(a) The AUTHORITY will establish mechanisms for coordination and information-sharing with the public authorities and stakeholders involved in or affected by Sandbox operations, including, as relevant:

(1) law enforcement and national security authorities;

(2) the Royal Air Force of Oman and other military authorities;

(3) civil defence and emergency services;

(4) environmental and land-use planning authorities;

(5) municipalities and local authorities;

(6) the telecommunications and spectrum regulator;

(7) the national cybersecurity authority; and

(8) other entities designated by the State.

(b) Such mechanisms may include inter-agency committees, memoranda of understanding, joint emergency and contingency plans, and agreed arrangements for notification, consultation and approval.

(c) The AUTHORITY will ensure, as far as practicable, that the roles and responsibilities of each entity in relation to Sandbox operations are defined, documented and communicated.

AMC1 CAR-AAM.SB.120 – Minimum Topics for Inter-Agency Coordination

(a) When establishing coordination mechanisms under CAR-AAM.SB.120, the AUTHORITY should address, at a minimum:

(1) airspace management and segregation, including use of restricted/prohibited areas where required;

(2) management of security threats and incidents involving AAM aircraft or infrastructure;

(3) emergency response and rescue, including access arrangements for emergency vehicles to vertiports/landing sites;

(4) protection of critical infrastructure and sensitive sites;

(5) environmental protection, including noise and emissions aspects where relevant;

(6) land-use and urban planning considerations for vertiports and AAM routes;

(7) spectrum and communications issues related to command and control links and UTM/ATM connectivity;

(8) civil-military airspace coordination and flexible use of airspace; and

(9) alerting and search and rescue arrangements.

(b) Where appropriate, joint exercises or simulations involving AAM Sandbox scenarios should be conducted with the participation of relevant public authorities and services.

GM1 CAR-AAM.SB.120 – Example Coordination Framework

(a) An example coordination framework could include:

(1) a National AAM Sandbox Coordination Group, chaired by the AUTHORITY, with representatives from key ministries, authorities and agencies;

(2) bilateral MoUs between the AUTHORITY and specific entities (e.g. security, emergency services, municipalities, telecom regulators) addressing roles, information-sharing and incident handling; and

(3) project-specific coordination plans for each Sandbox project, identifying local points of contact, escalation paths and communication procedures.

(b) The level of formality and detail of the coordination arrangements should be proportionate to the scale, complexity and risk of the AAM Sandbox activities envisaged.

CAR-AAM.SB.125 Inter-Agency AAM Sandbox Cell

(a) The AUTHORITY will establish and maintain an Inter-Agency AAM Sandbox Cell to support the evaluation, authorisation, coordination and oversight of Sandbox Projects that:

(1) use shared or mixed airspace or interface with ATS;

(2) are conducted in, over or adjacent to populated or sensitive areas;

(3) involve passenger carriage, public-facing services or material public exposure; or

(4) are assigned Complexity Level L3.

(b) The Inter-Agency Cell will include or consult the entities responsible for: ANS and airspace management; UTM governance; aviation security and law enforcement; cybersecurity and critical infrastructure protection; emergency response and disaster management; land use and permitting; and spectrum and telecommunications.

(c) Before any phase that materially depends on inter-agency interfaces is authorised, the Inter-Agency Cell will issue an Inter-Agency Readiness Statement confirming that:

(1) the required approvals, interfaces and coordination arrangements are in place;

(2) joint procedures, including degraded-mode and contingency procedures, have been agreed; and

(3) emergency response roles and communication paths are established,

and that these are adequate for the intended operating envelope.

(d) The AUTHORITY will not authorise such a phase while the Inter-Agency Readiness Statement is outstanding or identifies an unresolved critical gap or unmitigated dependency.

(e) The outputs of the Inter-Agency Cell will be retained as controlled records available for oversight, audit and investigation.

(f) The AUTHORITY may designate an existing inter-agency body, including a civil-military coordination cell, as the Inter-Agency Cell, provided that it is chaired by the AUTHORITY and includes or consults the entities referred to in paragraph (b).

AMC1 CAR-AAM.SB.125 – Minimum Artefacts and Recordkeeping

The Inter-Agency Cell should maintain, at minimum:

(a) an Interface Register identifying applicable MoUs/LOAs/ICDs and other inter-agency instruments, their status, validity and responsible owners;

(b) a Decision Log documenting constraint, operational restrictions, risk assumptions, and go/no-go rationales;

(c) an Escalation and Duty Contact Tree (24/7 where applicable), including notification triggers;

(d) an Emergency Coordination Plan, including coordination arrangements, joint exercises/drills (where required), and lessons learned; and

(e) Public Communication Protocol addressing disruptions, abnormal events, safety/security incidents, and coordinated messaging responsibilities.

The templates of Appendix 1, F1-10, should be used.

GM1 CAR-AAM.SB.125 – Governance Intent

This provision converts inter-agency “coordination” into enforceable governance by making external dependencies explicit, managed and auditable, thereby reducing the risk that non-CAA interfaces become hidden single points of failure.

CAR-AAM.SB.127 Sandbox Programme Coordination

(a) Where a Sandbox Programme involves several Sandbox Projects, operating sites or Sandbox Operators, the AUTHORITY may designate or recognise a Programme Coordination Office to coordinate, as applicable:

(1) the scheduling of activities and the allocation of shared sites, airspace volumes and time slots;

(2) requests for airspace activation and coordination with the ANSP, USSPs and military authorities, through the arrangements established under CAR-AAM.SB.400 and CAR-AAM.SB.405;

(3) logistics, ground support, customs and site access;

(4) a common operational picture and a Shared OCC Facility under CAR-AAM.SB.305(f); and

(5) the consolidation of programme-level data and lessons learned for transmission to the AUTHORITY.

(b) A Programme Coordination Office shall not:

(1) exercise Operational Control, which remains with each Sandbox Operator under CAR-AAM.SB.305(a);

(2) issue, amend, limit, suspend or revoke any Sandbox Approval, Sandbox Flight Permit, exemption or other authorisation; or

(3) accept residual risks on behalf of a Sandbox Operator or of the AUTHORITY.

(c) A Programme Coordination Office may suspend programme activities it coordinates, including by withdrawing a time slot or deactivating a shared volume, when a programme-level Stop Condition specified in a Sandbox Approval is met or when continued activity would be unsafe. It shall immediately inform the Sandbox Operators concerned and the AUTHORITY. Such action is not a suspension under CAR-AAM.SB.185.

(d) A Programme Coordination Office shall not be headed or staffed by persons exercising oversight or decision functions under this Regulation for the Sandbox Programme concerned. Its arrangements with each Sandbox Operator shall be documented and recorded in the Interface Register (Appendix 1, F1-10).

(e) Programme management support, consultancy, digital platforms and decision-support tools engaged for a Sandbox Programme have no regulatory function and no Operational Control. Where such a platform or tool supports a safety-critical or mission-critical function, it is a DSP subject to CAR-AAM.SB.455.

GM1 CAR-AAM.SB.127 – Programme Governance Structure

(a) A typical Sandbox Programme structure may include: a steering body setting policy and priorities, without involvement in individual approvals; a Programme Coordination Office; a Shared OCC Facility; a programme safety and compliance function; programme management support; and the Inter-Agency Cell.

(b) The regulatory chain (TT, SOT and Decision-Maker) remains separate from the programme chain. Sandbox Approvals, phase authorisations, conditions, Stop Conditions and suspensions remain with the AUTHORITY and the Sandbox Operators as provided in this Regulation, and economic or programme considerations are taken into account only in accordance with CAR-AAM.SB.160(b).

(c) A programme safety and compliance function may monitor programme-level hazards, report directly to the AUTHORITY and trigger the measures in CAR-AAM.SB.127(c). It does not replace the Safety Management System and nominated safety person of each Sandbox Operator under CAR-AAM.SB.150(b)(1) and CAR-AAM.SB.210.

(d) Programme operating zones, such as logistics, air taxi, medical or inspection zones, should each correspond to one or more identified Sandbox Projects, each with its Sandbox Operator, Accountable Manager, Complexity Level and Sandbox Approval number.

CAR-AAM.SB.130 Authority Capability Development

(a) The AUTHORITY will establish and maintain an AAM Oversight Capability Plan commensurate with the scope and complexity of Sandbox activities, addressing:

(1) roles, responsibilities and competency requirements for TT and SOT functions;

(2) initial, recurrent and on-the-job training and qualification of oversight personnel;

(3) tools, resources and data access for performance monitoring and oversight of digital and cybersecurity dependencies;

(4) specialist support in cybersecurity, systems engineering, automation and artificial intelligence assurance, UTM integration, vertiport design, dangerous goods and human factors; and

(5) the resources required for the drafting of permanent AAM regulations, kept separate from the personnel performing TT and SOT functions.

(b) For Complexity Level L3 projects and for EIS, the AUTHORITY will define capability milestones and will not authorise the phase concerned until those milestones are met.

(c) The AUTHORITY will review the AAM Oversight Capability Plan at least every 12 months.

AMC1 CAR-AAM.SB.130 – Competency Matrix Scope

The AAM Oversight Capability Plan should include a competency matrix covering, as applicable:

(a) operations and operational control/OCC oversight;

(b) integrated safety and security risk management and safety assurance;

(c) airworthiness acceptance/validation liaison and continuing airworthiness oversight;

(d) ANS/ATM and UTM/U-space integration oversight;

(e) vertiport/landing site oversight, emergency preparedness and ground operations interfaces;

(f) cybersecurity and DSP oversight, including incident response assurance;

(g) environmental and community interface oversight;

(h) economic, insurance and consumer/user protection interfaces (where applicable);

(i) automation and artificial intelligence assurance; and

(j) dangerous goods.

GM1 CAR-AAM.SB.130 – Oversight Maturity and Scaling

Oversight capability is a safety enabler. If oversight maturity, tools or competencies are not sufficient for the intended exposure and complexity, the AUTHORITY should apply restrictions, hold points or phase limitations until the required capability is established.

CAR-AAM.SB.135 Processing Timelines

(a) The AUTHORITY will acknowledge receipt of an application within 10 working days and inform the applicant whether the application is complete.

(b) The AUTHORITY will endeavour to issue its decision on a complete application within the following periods, excluding any time during which the AUTHORITY is awaiting information from the applicant:

Decision	L1	L2	L3
Initial Sandbox Approval (working days)	30	60	90
Phase Gate or Major Change (working days)	15	30	45
EIS Readiness Review (working days)	30	45	60

(c) Where the AUTHORITY cannot meet a period in paragraph (b), it will inform the applicant in writing, with reasons and a revised date.

(d) An application that remains incomplete 90 days after a request for information may be closed without a decision.

CAR-AAM.SB.140 Fees and Public Register

(a) Fees for applications, approvals, permits, changes and oversight are payable in accordance with the schedule of charges published by the AUTHORITY.

(b) The AUTHORITY will maintain a public register of Sandbox Approvals showing, for each: the Sandbox Operator; the use case; the general operating area; the current phase; the validity dates; and any suspension or revocation.

(c) The AUTHORITY will not publish commercially sensitive or security-sensitive information. An applicant shall identify such information when submitting it, with reasons.

CAR-AAM.SB.145 Reconsideration

(a) An applicant or Sandbox Operator affected by a decision to refuse, limit, suspend or revoke a Sandbox Approval, Sandbox Flight Permit or exemption may request reconsideration in writing within 30 days of notification of the decision.

(b) Reconsideration will be carried out by an official of the AUTHORITY who was not involved in the original decision. The AUTHORITY will decide within 30 working days of receiving the request.

(c) A request for reconsideration does not suspend a decision taken for immediate safety or security reasons.

(d) This rule is without prejudice to any right of appeal under the Civil Aviation Law or other applicable legislation.

SUBPART C – ELIGIBILITY, APPLICATION, APPROVAL, PHASING AND CHANGES

CAR-AAM.SB.150 Eligibility

(a) A Sandbox Approval may be issued only to a legal entity registered in the Sultanate of Oman that the AUTHORITY considers capable of conducting the proposed operations safely and securely.

(b) The applicant shall demonstrate, to the satisfaction of the AUTHORITY, that it has:

(1) an organisational structure with a nominated Accountable Manager and nominated persons responsible for operations, continuing airworthiness, safety, security and compliance monitoring, each acceptable to the AUTHORITY. Subject to the agreement of the AUTHORITY and proportionate to the Complexity Level, one person may hold more than one of these functions, provided that the compliance monitoring function remains independent of the functions it monitors;

(2) sufficient technical, operational and managerial capability, held internally or through formal partnerships;

(3) access to, or control of, the AAM Aircraft, systems, infrastructure, personnel and services required;

(4) a Safety Management System meeting CAR-AAM.SB.210 and a security programme meeting CAR-AAM.SB.225;

(5) financial resources sufficient for the safe conduct of the project and for its orderly wind-down under CAR-AAM.SB.615;

(6) insurance meeting CAR-AAM.SB.555; and

(7) an acceptable record of regulatory compliance and integrity for the applicant and its nominated persons.

(c) For a consortium, the applicant shall be the single Sandbox Operator and shall hold contractual rights giving it control over every element critical to safety, security and compliance.

(d) The AUTHORITY may establish additional eligibility conditions for a Sandbox Programme, including conditions related to Omanisation or local partnership, provided they are published before the Programme opens.

(e) The AUTHORITY may refuse to process an application from an applicant that does not meet, or is unlikely to meet, the eligibility requirements.

AMC1 CAR-AAM.SB.150 – Minimal Organizational and Governance Capabilities

(a) When assessing eligibility, the AUTHORITY should verify that the applicant:

(1) has designated an Accountable Manager with authority over the AAM Sandbox activities and sufficient decision-making powers and resources;

(2) has appointed competent managers or focal points for safety, security, operations and compliance;

(3) has defined internal reporting lines and decision-making processes for risk acceptance and operational changes; and

(4) can demonstrate prior relevant experience in aviation, unmanned aircraft systems, complex operations, safety management or similar fields, either internally or through formal partnerships.

(b) For consortium-based Sandbox Projects, the AUTHORITY should require:

(1) a clear allocation of responsibilities between consortium members;

(2) a single entity identified as Sandbox Operator and primary point of contact for the AUTHORITY; and

(3) contractual arrangements that ensure the Sandbox Operator has sufficient control over all elements critical to safety, security and compliance.

GM1 CAR-AAM.SB.150 – Examples of Eligible Sandbox Operators

(a) Depending on the project, the following entities may be considered as potential Sandbox Operators, subject to meeting the eligibility criteria:

(1) an existing certified operator (e.g. air operator, ANSP, aerodrome operator) expanding into AAM activities;

(2) a manufacturer or integrator of AAM aircraft partnering with a local operator;

(3) a technology or logistics company forming a consortium with aviation-experienced partners; or

(4) a public–private partnership established for specific public service use cases.

(b) The AUTHORITY may consider favorably projects that include local partners and contribute to building sustainable national capability in AAM operations, maintenance, data services or infrastructure.

CAR-AAM.SB.155 Application

(a) An application for a Sandbox Approval shall be submitted on Form AWR-033 (Route C), together with the Sandbox Supplement (Appendix 1, F1-01), the Complexity Level Self-Assessment (F1-03) and the Applicability and Compliance Matrix (F1-04), and shall be signed by the Accountable Manager.

(b) The application shall include, as a minimum:

(1) information on the applicant, including legal status, ownership, governance structure, nominated persons and consortium agreements;

(2) a CONOPS and ODD describing the purpose and use cases, the operating environment (areas, routes, airspace classes, population density, critical infrastructure and climatic conditions), the AAM Aircraft and systems, the Automation Level, and the phases and their duration;

(3) the proposed Complexity Level with justification against CAR-AAM.SB.157;

(4) the integrated safety and security risk assessment under CAR-AAM.SB.200 and CAR-AAM.SB.205 and, for Complexity Level L2 and L3 projects, the Safety Case;

(5) the Airworthiness Basis Declaration under CAR-AAM.SB.250 or an application for a Sandbox Flight Permit under CAR-AAM.SB.252;

(6) the draft Operations Manual under CAR-AAM.SB.300;

(7) descriptions of the Safety Management System and the security programme;

(8) personnel licensing and training arrangements;

(9) vertiport and landing site arrangements;

(10) ANS, UTM, C2 CSP and DSP arrangements;

(11) the dangerous goods policy under CAR-AAM.SB.325;

(12) a summary of the cybersecurity evidence pack under CAR-AAM.SB.460;

(13) the environmental screening under CAR-AAM.SB.500 and the community engagement plan under CAR-AAM.SB.510;

(14) a summary of the business model, evidence of insurance and the consumer information arrangements under Subpart K;

(15) the Performance Monitoring Plan under CAR-AAM.SB.600;

(16) the initial Applicability and Compliance Matrix under CAR-AAM.SB.020(d);

(17) the wind-down plan under CAR-AAM.SB.615; and

(18) any other information reasonably required by the AUTHORITY.

(c) The information shall be provided in a form acceptable to the AUTHORITY. Where the AUTHORITY has published a template in Appendices 1 to 10, the applicant should use it. Information provided in Form AWR-033 need not be repeated in the forms of Appendix 1; GM2 CAR-AAM.SB.155 shows where each item of paragraph (b) is provided.

(d) The applicant shall declare that the information submitted is complete and accurate, and shall notify the AUTHORITY without delay of any change to that information before a decision is issued.

(e) The AUTHORITY may request additional information, clarification or revision where an application is incomplete, unclear or insufficient to support a decision.

(f) The level of detail of each item in paragraph (b) shall be proportionate to the Complexity Level, as set out in AMC2 CAR-AAM.SB.155.

AMC1 CAR-AAM.SB.155 – Application Structure and Level of Detail

(a) The AUTHORITY publishes the AWR-033 Guidance Manual, which describes the structure, content and level of detail of applications made on Form AWR-033, including applications for a Sandbox Approval.

(b) The level of detail required in the CONOPS, risk assessment and supporting documentation should be proportionate to:

(1) the complexity and novelty of the proposed operations;

(2) the scale and duration of the project; and

(3) the potential impact on safety, security, environment and the public.

(c) As an example:

(1) a small-scale, non-urban cargo operation may require a relatively concise CONOPS and risk assessment;

(2) a large-scale urban passenger eVTOL service will require a significantly more detailed CONOPS, safety case, security assessment and stakeholder interface description.

AMC2 CAR-AAM.SB.155 – Proportionate Application Content by Complexity Level

(a) The content of each item of CAR-AAM.SB.155(b) should be provided at the level shown below.

Item	SB.155(b)	L1	L2	L3
1	Applicant, governance and consortium information	Full (AWR-033 Part A; F1-01 Section 1)	Full	Full
2	CONOPS and ODD	Concise CONOPS	Full CONOPS	Full CONOPS
3	Complexity Level justification	F1-03	F1-03	F1-03
4	Integrated risk assessment / Safety Case	SORA or equivalent summary	SORA and Safety Case	Full Safety Case
5	Airworthiness Basis or Sandbox Flight Permit	Full	Full	Full
6	Draft Operations Manual	Operating procedures summary	Full	Full
7	SMS and security programme	SMS description and security outline	SMS manual and security programme	SMS manual and security programme
8	Personnel licensing and training	Full	Full	Full
9	Vertiport and landing site arrangements	Site list and site assessment	Full	Full
10	ANS, UTM, C2 CSP and DSP arrangements	Declaration and coordination evidence	LOA / ICD	LOA / ICD and service performance
11	Dangerous goods policy	Declaration	Policy	Policy

Item	SB.155(b)	L1	L2	L3
12	Cybersecurity evidence pack summary	Declaration of baseline controls	Summary	Summary
13	Environmental screening and community engagement plan	Screening only	Screening and plan	Full
14	Business model, insurance and consumer information	Insurance evidence	Summary and insurance evidence	Full
15	Performance Monitoring Plan	Core indicators (AMC1 SB.600)	Full	Full
16	Applicability and Compliance Matrix	F1-04	F1-04	F1-04
17	Wind-down plan	Declaration	Plan	Plan and financial guarantee where required

(b) A declaration is a statement signed by the Accountable Manager that confirms the arrangement and identifies the supporting evidence held by the applicant, which the AUTHORITY may inspect at any time.

(c) The AUTHORITY may require full content for any item where the risk profile, the novelty of the operation or the outcome of a previous assessment justifies it.

GM2 CAR-AAM.SB.155 – Correspondence with Form AWR-033

(a) Each item of CAR-AAM.SB.155(b) is provided once, either in Form AWR-033 and its attachments or in the Sandbox Supplement (F1-01):

SB.155(b)	Item	Form AWR-033 (Issue 2)	Appendix 1 form
(1)	Applicant, ownership, governance, nominated persons, consortium	A1–A6; AT01, AT11	F1-01 Section 1; F1-02 (AUTHORITY)
(2)	CONOPS and ODD	B, C, D, E; AT03, AT04, AT06	F1-01 Sections 2–4
(3)	Complexity Level justification	0.6, 0.8	F1-03
(4)	Integrated risk assessment; Safety Case (L2, L3)	F; AT07, AT08	F1-01 Section 9 (Safety Case)
(5)	Airworthiness Basis Declaration or Sandbox Flight Permit application	C1, C2.11; AT05	F1-01 Section 5
(6)	Draft Operations Manual	G1; AT06	—
(7)	SMS and security programme	AT12, AT13	F1-01 Section 9
(8)	Personnel licensing and training	A5, G2; AT11	—
(9)	Vertiport and landing site arrangements	D2	F1-01 Section 7
(10)	ANS, UTM, C2 CSP and DSP arrangements	A6, C2.3–C2.4, E; AT09	F1-01 Sections 6 and 9
(11)	Dangerous goods policy	G7; AT14	—
(12)	Cybersecurity evidence pack summary	G6; AT13	F1-01 Section 9
(13)	Environmental screening and community engagement plan	—	F1-01 Section 9
(14)	Business model, insurance, consumer information	G8; AT02	F1-01 Section 9
(15)	Performance Monitoring Plan	B5, G9	F1-01 Section 9
(16)	Applicability and Compliance Matrix	AT17	F1-04
(17)	Wind-down plan	—	F1-01 Section 9
(18)	Other information requested	H2 (open items)	As requested

(b) Form AWR-033 is also used for operations outside this Regulation: standard drone permits (Route A) and approvals under CAR 102 with conditions derived from the SORA (Route B). The same SORA edition and compliance matrix format are used on all routes so that files can be converted under CAR-AAM.SB.657 without repeating assessments.

CAR-AAM.SB.157 Complexity Level

(a) The AUTHORITY will assign a Complexity Level to each Sandbox Project at approval and will review it at each Phase Gate and Major Change.

(b) The Complexity Level is the highest level indicated by any of the following criteria:

Criterion	L1	L2	L3
Persons carried	None	None	Any passenger, or any crew other than test crew
Population overflown	Sparsely populated, or controlled ground area	Populated	Congested, or assemblies of people
Airspace	Segregated or uncontrolled	Uncontrolled with UTM, or controlled with an LOA	Integrated with ATS traffic, or in the vicinity of a major aerodrome
SORA SAIL (where used)	I to II	III to IV	V to VI
Degree of human intervention	Pilot able to intervene at all times	Pilot supervising (on the loop)	No real-time human intervention in safety-critical functions
Aircraft simultaneously airborne	1 to 3	4 to 10	More than 10
Infrastructure	Landing sites without public access	Vertiport with restricted public access	Vertiport with public access, or located at an aerodrome

(c) The Complexity Level determines the depth of the application, the Safety Management System and OCC arrangements required, the intensity of oversight and the processing timelines under CAR-AAM.SB.135.

(d) The AUTHORITY may assign a higher Complexity Level than the criteria indicate, stating its reasons in writing.

(e) The AUTHORITY will record, together with the Complexity Level, the Target CAR-AAM Category of the Sandbox Project, determined in accordance with AMC1 CAR-AAM.SB.157, and will review it at each Phase Gate and Major Change.

AMC1 CAR-AAM.SB.157 – Target CAR-AAM Category

(a) The Target CAR-AAM Category should be determined using the following correspondence between Complexity Levels and the categories of CAR-AAM:

Complexity Level	Typical profile (SB.157 criteria)	Target CAR-AAM category	Instrument at transition
L1	No persons carried; sparsely populated or controlled ground area; segregated or uncontrolled airspace; SAIL I to II	Specific category: standard scenario, pre-defined risk assessment or SAIL I to II authorisation	Declaration or operational authorisation
L2	Populated area; uncontrolled airspace with UTM or controlled airspace with an LOA; SAIL III to IV; pilot on the loop	Specific category, SAIL III to IV	Operational authorisation; light UAS operator certificate (LUC) once mature
L3 – unmanned, no certified-category trigger	Congested area; SAIL V to VI; more than 10 aircraft; high automation	Specific category, SAIL V to VI with design verification	Operational authorisation

Complexity Level	Typical profile (SB.157 criteria)	Target CAR-AAM category	Instrument at transition
L3 – unmanned, certified-category trigger	Carriage of persons; dangerous goods with high risk to third parties; aircraft of 3 m or more over assemblies of people	Certified category (CAR-AAM.CERT)	Certified-category operator certificate and type certificate
L3 – piloted VTOL-capable aircraft	Passengers or crew on board a VTOL-capable aircraft	Manned VTOL-capable aircraft operations (CAR-AAM.IAM), with CAR-FCL and CAR 139	VTOL operator approval, pilot type rating, vertiport certificate

(b) The certified-category triggers follow Regulation (EU) 2019/947, Article 6, as amended by Regulation (EU) 2024/1110. Operations that would fall within the open category of CAR-AAM are not brought into the Sandbox.

(c) The Target CAR-AAM Category is indicative and does not prejudge any decision taken under CAR-AAM.

CAR-AAM.SB.160 Evaluation and Decision

(a) The AUTHORITY will evaluate each application against published criteria, taking into account:

(1) the applicant's eligibility under CAR-AAM.SB.150;

(2) the completeness and quality of the application;

(3) the robustness of the risk assessment, the proposed mitigations and the residual risks;

(4) the safety, security and environmental risk profile of the proposed operations;

(5) the AUTHORITY's oversight capacity under CAR-AAM.SB.100(b)(1) and CAR-AAM.SB.130; and

(6) the alignment of the project with national priorities and its expected learning and socio-economic value.

(b) The criterion in paragraph (a)(6) will be considered only once the criteria in paragraphs (a)(1) to (a)(4) are satisfied.

(c) The AUTHORITY will decide to approve the application, approve it with conditions, request further information or modification, or refuse it. A refusal will state the reasons and refer to the reconsideration procedure under CAR-AAM.SB.145.

(d) The decision will be documented and notified to the applicant in writing.

AMC1 CAR-AAM.SB.160 – Evaluation Method and Documentation

(a) The AUTHORITY should use a structured evaluation method, which may include:

(1) a standardized evaluation checklist or scoring grid;

(2) multidisciplinary review by the AAM Sandbox Technical Team (TT); and

(3) documented recommendations to the designated decision-maker.

(b) The evaluation documentation should record, as a minimum:

(1) the key strengths and weaknesses of the application;

(2) identified risks and uncertainties;

(3) conditions and limitations proposed by the TT; and

(4) the rationale for the decision taken.

(c) In any scoring grid, safety and security criteria should be applied as pass or fail conditions and should not be offset by scores on other criteria.

GM1 CAR-AAM.SB.160 – Example Evaluation Criteria

(a) Example evaluation criteria may include:

(1) Safety & Security

– quality and completeness of the risk assessment;

– adequacy of safety and security mitigations;

– maturity of SMS and security management processes.

(2) Operational Feasibility

– realism of the CONOPS;

– availability of aircraft, infrastructure and support services;

– readiness of interfaces with ANSP, UTM and vertiports.

(3) Environmental & Community Impact

– management of noise and emissions;

– consideration of sensitive areas;

– planned engagement with local communities.

(4) Innovation & Economic/Social Value

– novelty and potential to add value to the national aviation system;

– contribution to NAS 2040 objectives;

– potential for jobs, investment or public service improvement.

(b) The AUTHORITY may adapt these criteria depending on the specific Sandbox Programme or use case.

CAR-AAM.SB.165 Sandbox Approval, Phasing and Validity

(a) A Sandbox Approval will be issued in the format of Appendix 11 and will specify:

(1) the Sandbox Operator and any consortium members;

(2) the Complexity Level;

(3) the authorised use cases, AAM Aircraft (by type and registration), operating areas, Operational Volumes, vertiports and landing sites;

(4) the phases of the Sandbox Project, with the entry criteria, exit criteria and limitations of each phase;

(5) the Stop Conditions under CAR-AAM.SB.175;

(6) the project-specific list of Notifiable and Major Changes;

(7) the reporting, data access and performance monitoring requirements;

(8) the validity period; and

(9) the Target CAR-AAM Category and the questions of the Regulatory Learning Plan addressed by the Sandbox Project.

(b) A Sandbox Project should be structured in phases, typically:

– Phase 0 – ground, bench and integration testing;

– Phase 1 – limited operations in a segregated volume, within VLOS or with a safety observer;

– Phase 2 – BVLOS operations in defined corridors or volumes with enhanced monitoring;

– Phase 3 – expanded density and complexity (night, weather, automation) as approved; and

– Phase 4 – EIS, subject to CAR-AAM.SB.170.

(c) Before each phase, the Sandbox Operator shall submit a Phase Gate package containing, as applicable:

(1) the updated CONOPS, ODD and operational limitations (volumes, altitudes, routes and times);

(2) the updated hazard and threat register and residual risk acceptance statement;

(3) SORA outputs and OSO compliance evidence;

(4) the emergency response plan and evidence of the exercises relevant to the phase;

(5) evidence of OCC and Operational Control readiness;

(6) evidence of validated ANS, UTM and C2 CSP interfaces, including degraded modes;

(7) the cybersecurity evidence pack;

(8) training, checking and licensing records for all operational roles;

(9) evidence of vertiport and landing site readiness;

(10) evidence of occurrence and performance reporting readiness;

(11) confirmation of insurance;

(12) the updated Applicability and Compliance Matrix; and

(13) the interim Sandbox Conversion Annex under CAR-AAM.SB.655(c).

(d) The AUTHORITY will authorise a phase only when its entry criteria are met on the basis of objective evidence and, where required, an Inter-Agency Readiness Statement has been issued.

(e) The validity of a Sandbox Approval shall not exceed 24 months and shall not extend beyond the expiry of this Regulation, except under transitional measures adopted under CAR-AAM.SB.665(e). The AUTHORITY may renew a Sandbox Approval once, for up to 12 months, on the basis of performance evidence.

AMC1 CAR-AAM.SB.165 – Phasing Logic and Duration

(a) The AUTHORITY should use phasing as a key risk control measure, ensuring that:

(1) initial phases are limited in scope (e.g. restricted areas, reduced hours, limited fleet size);

(2) operational experience and data are collected before expansion; and

(3) explicit “go/no-go” decision points are defined between phases.

(b) For each phase, the Sandbox Approval or associated documentation should specify:

(1) the permitted operations and their limitations;

(2) the specific conditions or mitigations to be in place;

(3) the safety, security and performance indicators to be monitored; and

(4) the criteria for progressing to the next phase or for revising the project.

(c) In determining duration, the AUTHORITY should consider:

(1) the minimum period required to collect meaningful data and lessons learned;

(2) the risk that long durations without review may entrench arrangements that are not yet suitable for permanent approval; and

(3) alignment with the overall review and sunset cycle of the AAM Sandbox Regulation.

GM1 CAR-AAM.SB.165 – Example Phasing Approach

(a) An example phasing approach might be:

(1) Phase 1 – Pilot

– limited number of aircraft;

– limited geographic area;

– restricted hours of operation;

– close CAA presence and frequent reporting.

(2) Phase 2 – Expansion

– increased number of aircraft or routes;

– extended hours or additional locations;

– continued monitoring with slightly reduced CAA direct presence, based on demonstrated performance.

(3) Phase 3 – Pre-Transition

– stable operations with mature procedures;

– use of results to prepare either:

(i) permanent regulation/approvals; or

(ii) controlled closure of the project.

(b) The actual phasing and duration will vary per project and should be tailored by the AUTHORITY in the Sandbox Approval.

CAR-AAM.SB.170 Entry into Service (EIS) Readiness Review

(a) The AUTHORITY will not authorise EIS unless an EIS Readiness Review has been concluded with a satisfactory outcome.

(b) For the purposes of this Regulation, EIS means any of the following:

(1) the carriage of passengers;

(2) routine public-facing services, including paid demonstrations and scheduled or on-demand services;

(3) a material increase in operational tempo, complexity or public exposure beyond previously approved activities; or

(4) the expansion of operations to new operating areas, corridors, vertiports or landing sites, or to materially different operating conditions, where this introduces higher exposure.

(c) No passenger shall be carried unless the AAM Aircraft meets CAR-AAM.SB.250(e) and the pilot meets CAR-AAM.SB.310(c).

(d) The Sandbox Operator shall submit an EIS Readiness Dossier, in the format and within the timelines specified by the AUTHORITY, demonstrating readiness in each domain of CAR-AAM.SB.015(b) and including a traceable safety argument linking the CONOPS and ODD, hazards and threats, risk controls, verification evidence, performance thresholds and Stop Conditions.

(e) The AUTHORITY will record its decision as one of the following:

(1) EIS authorised;

(2) EIS authorised with restrictions and enhanced monitoring; or

(3) EIS not authorised, with reasons, required corrective actions and resubmission expectations.

(f) Where EIS is authorised, the AUTHORITY will specify the operational limitations, performance monitoring requirements, enhanced surveillance and Stop Conditions applicable to an initial EIS period of not less than 6 months.

(g) The Sandbox Operator shall notify the AUTHORITY without undue delay of any event, change, degradation of assumptions or emerging risk that may invalidate the basis of the EIS authorisation, and shall apply CAR-AAM.SB.175 where necessary.

AMC1 CAR-AAM.SB.170 – EIS Readiness Dossier — Minimum Content and Evidence

(a) The EIS Readiness Dossier should be submitted as a controlled package and include, as applicable:

(1) an updated CONOPS/ODD and Applicability and Compliance Matrix (CAR-AAM.SB.020(d));

(2) the integrated hazard/threat register status and residual risk acceptance statement;

(3) readiness inspection results for aircraft, infrastructure and operational systems;

(4) evidence of training completion, checks, competency assessments and recurrent requirements;

(5) results of emergency response drills/exercises and corrective actions closure;

(6) UTM/ANS interface validation evidence, including degraded-mode exercises where applicable;

(7) cyber evidence pack summary, including confirmation that no unresolved critical vulnerabilities remain for safety-critical functions, or justification of compensating measures accepted by the AUTHORITY; and

(8) KPI baseline values, thresholds and triggers proposed for the EIS period, including leading indicators for C2 link events, conformance deviations, UTM degradations and cyber incidents (as applicable).

(b) The EIS Readiness Dossier should include a clear and traceable "go/no-go" safety argument demonstrating alignment between the approved operational concept and the risk controls, by explicitly linking: CONOPS/ODD → hazards and threats → risk controls and mitigations → verification/validation evidence → performance monitoring and thresholds → stop conditions and withdrawal triggers.

AMC2 CAR-AAM.SB.170 – Restrictions and Enhanced Monitoring

(a) Where EIS is authorized with restrictions, the AUTHORITY should define restrictions proportionate to risk, which may include, as applicable:

(1) limits on operating areas, altitudes, times, weather minima, or exposure over congested areas;

(2) limits on passenger numbers, mission frequency or fleet size;

(3) additional operational staffing or OCC monitoring requirements;

(4) mandatory coordination steps with ATS/UTM prior to activation; and

(5) enhanced reporting cadence or real-time data access for oversight.

GM1 CAR-AAM.SB.170 – Purpose and Regulatory Intent of the EIS Readiness Review

EIS is a high-exposure milestone where the operational system is introduced to the public and/or scaled beyond limited trials. The EIS Readiness Review is intended to confirm that readiness is demonstrated across the end-to- end system (aircraft and continuing airworthiness, operator and operational control, infrastructure/vertiport readiness, ANS/UTM integration, emergency response, cybersecurity and digital service dependencies, and community measures), and that appropriate restrictions, enhanced monitoring and stop conditions are established to maintain an acceptable level of safety, security and public confidence.

CAR-AAM.SB.175 Stop Conditions and Immediate Restrictions

(a) The Sandbox Operator shall propose, and the AUTHORITY will specify in the Sandbox Approval, objective Stop Conditions for each phase.

(b) When a Stop Condition is met, or when the Sandbox Operator becomes aware of any condition that could make continued operation unsafe, the Sandbox Operator shall immediately restrict or suspend the affected operations.

(c) The Sandbox Operator shall notify the AUTHORITY within 24 hours of applying a restriction or suspension, stating the trigger, the operations affected and the immediate actions taken.

(d) Operations suspended under this rule shall not resume until the Sandbox Operator has submitted an analysis and corrective action plan and the AUTHORITY has agreed in writing to the resumption.

(e) Where a Programme Coordination Office has been designated or recognised under CAR-AAM.SB.127, the Sandbox Operator shall also inform it immediately of any restriction or suspension applied under this rule.

AMC1 CAR-AAM.SB.175 – Typical Stop Conditions

(a) Stop Conditions should be objective and measurable and should include, as applicable:

(1) C2 Link loss events above a defined rate;

(2) repeated conformance deviations indicating a systemic control weakness;

(3) any accident or serious incident;

(4) repeated or sustained UTM or DSP degradation affecting safety-critical functions beyond agreed assumptions;

(5) a cyber incident affecting safety-critical systems, identity, command integrity or operational availability;

(6) failure of emergency drills or exercises with unresolved critical findings;

(7) GNSS interference events above a defined rate;

(8) battery thermal events; and

(9) sustained breach of agreed community-impact thresholds where mitigations are ineffective.

CAR-AAM.SB.180 Management of Changes

(a) The Sandbox Operator shall establish a change management procedure, approved by the AUTHORITY, which includes the criteria for classifying changes as Minor, Notifiable or Major.

(b) Minor Changes shall be managed in accordance with the approved procedure and recorded. Records shall be made available to the AUTHORITY on request.

(c) Notifiable Changes shall be notified to the AUTHORITY at least 10 working days before implementation, together with the change impact assessment. The AUTHORITY may, within that period, reclassify a Notifiable Change as a Major Change.

(d) Major Changes shall not be implemented until approved in writing by the AUTHORITY. The following are always Major Changes:

(1) a new AAM Aircraft type, a change of Automation Level, or a change to flight control or other safety-critical software baselines;

(2) a change to Operational Volumes, routes, altitudes or airspace class, or an increase in density or complexity beyond the approved phase;

(3) the introduction of passenger carriage, BVLOS operations, night operations, dangerous goods or new mission types;

(4) a change of USSP, C2 CSP or safety-critical DSP, of C2 Link architecture, or of the design of the interface with ATS;

(5) a change to emergency or contingency concepts, or to detect-and-avoid assumptions;

(6) a change of Accountable Manager, or of the ownership or control of the Sandbox Operator; and

(7) the use of a new vertiport or landing site.

(e) Changes to the design of AAM Aircraft are also subject to CAR-AAM.SB.260.

(f) A change that would fundamentally alter the Sandbox Project requires a new application.

(g) For Notifiable and Major Changes, the Sandbox Operator shall provide:

(1) a change impact assessment covering safety, security, cybersecurity, environment and interfaces;

(2) the updated CONOPS and hazard and threat register;

(3) the updated evidence mapping, including verification activities and training impacts; and

(4) a rollback plan and any temporary limitations.

(h) Pending the AUTHORITY's review, the Sandbox Operator shall apply limitations or suspend affected operations where a change introduces uncontrolled risk or interface uncertainty.

AMC1 CAR-AAM.SB.180 – Change Management Procedure

(a) The AUTHORITY should require Sandbox Operators to have a formal change management process, covering changes in:

(1) organizational structure, key personnel or governance;

(2) aircraft types, configurations or critical systems;

(3) operational areas, routes, volumes or hours;

(4) interfaces with ANSPs, UTM providers or vertiports; and

(5) safety and security management arrangements.

(b) The Sandbox Approval or associated documentation should specify:

(1) which changes must be notified in advance and approved by the AUTHORITY; and

(2) which changes may be notified after implementation, where safety and security allow.

GM1 CAR-AAM.SB.180 – Case Examples

(a) Example of a Minor Change:

– Adjustment of internal reporting lines within the Operator that does not affect key accountable roles or safety responsibilities.

– Such a change is recorded under the approved procedure without prior notification to the AUTHORITY.

(b) Examples of Major Changes:

– Introduction of a new aircraft type with different performance or risk characteristics;

– Expansion of operations into a high-density urban area not covered in the original CONOPS.

– Such changes require prior approval by the AUTHORITY under CAR-AAM.SB.180(d).

CAR-AAM.SB.185 Limitation, Suspension and Revocation

(a) The AUTHORITY may limit, suspend or revoke a Sandbox Approval, in whole or in part, where:

(1) there is a serious or persistent safety, security or environmental risk;

(2) the Sandbox Operator has failed to comply with this Regulation, the Sandbox Approval or any applicable CAR;

(3) the Sandbox Operator has failed to implement agreed corrective actions within the agreed period;

(4) false, incomplete or misleading information has been provided;

(5) the Sandbox Operator has failed to provide required data, reports or access;

(6) the Sandbox Operator no longer meets the eligibility requirements, including insurance; or

(7) the AUTHORITY's oversight capability, or an inter-agency interface on which the Sandbox Approval depends, is no longer available.

(b) Where immediate action is required for safety or security, a limitation or suspension takes effect on notification. In other cases, the AUTHORITY will give the Sandbox Operator at least 10 working days to make representations before taking its decision.

(c) The Sandbox Operator may surrender its Sandbox Approval by written notice, subject to CAR-AAM.SB.615.

(d) Action under this rule is without prejudice to enforcement action under CAR 12.

AMC1 CAR-AAM.SB.185 – Triggers for Suspension

(a) Grounds for suspension may include, for example:

(1) a serious incident or accident indicating that risks are not adequately controlled;

(2) repeated or systemic non-compliances;

(3) failure to implement agreed corrective actions; or

(4) failure to provide required data or reports.

GM1 CAR-AAM.SB.185 – Suspension Scenario

An occurrence reveals a critical weakness in the Sandbox Operator's control of C2 Link resilience or detect-and- avoid capability, and immediate mitigations are not available. The AUTHORITY may suspend operations in the affected area or phase until satisfactory corrective actions are implemented.

SUBPART D – SAFETY, SECURITY AND RISK MANAGEMENT

CAR-AAM.SB.200 Integrated Safety and Security Risk Management

(a) The Sandbox Operator shall establish and maintain an integrated safety and security risk management process covering all its Sandbox operations, embedded in its Safety Management System and security programme.

(b) The process shall:

(1) identify hazards and threats related to the operations, aircraft, automation, systems, infrastructure, energy storage, data, environment and human factors;

(2) assess the risks to occupants, third parties, other airspace users, critical infrastructure and the environment;

(3) define mitigations proportionate to the assessed risks and to the maturity of the concept, with an owner and verification evidence for each mitigation;

(4) apply the risk tolerability matrix and risk acceptance levels of Appendix 2, Part A, or an alternative matrix accepted by the AUTHORITY;

(5) identify the level at which each residual risk may be accepted; and

(6) require re-assessment at each Phase Gate, Change, occurrence, cyber event and interface change.

(c) Residual risks in the highest tolerable category shall not be accepted by the Sandbox Operator alone and shall be submitted to the AUTHORITY for decision.

(d) The Sandbox Operator shall maintain an integrated hazard and threat register and a residual risk acceptance statement signed by the Accountable Manager, and shall submit both with each application, Phase Gate package and Major Change.

AMC1 CAR-AAM.SB.200 – Process Characteristics

(a) The integrated safety and security risk management process should normally include:

(1) definition of the operational context and scenarios (phases, routes, airspace, environment, stakeholders);

(2) systematic hazard and threat identification;

(3) analysis and evaluation of risks, using defined criteria and matrices;

(4) selection and implementation of technical, operational, organizational and security mitigations;

(5) allocation of responsibilities for each mitigation; and

(6) periodic review and update of the assessment, in particular after changes or occurrences.

(b) The depth of analysis should be proportionate to the complexity and risk of the Sandbox project. Higher-risk projects require more detailed analysis and assurance.

AMC2 CAR-AAM.SB.200 – Risk Acceptance Levels

(a) A typical risk acceptance scheme should provide that:

(1) risks in the lower tolerable region are accepted by the nominated safety manager;

(2) risks in the upper tolerable region are accepted by the Accountable Manager;

(3) risks in the highest tolerable category are submitted to the AUTHORITY under CAR-AAM.SB.200(c); and

(4) intolerable risks are not accepted and the operation does not proceed.

(b) Each key mitigation should be supported by verification evidence (test, inspection or monitoring data).

GM1 CAR-AAM.SB.200 – Integrated Risk Register

(a) An integrated risk register may include, for each hazard or threat:

(1) description of the hazard or threat;

(2) potential consequences (safety, security, environment, service continuity);

(3) initial risk level;

(4) mitigations and barriers;

(5) residual risk level;

(6) owner for each mitigation; and

(7) references to supporting evidence (tests, procedures, data).

(b) A single integrated register helps to avoid conflicts between safety and security mitigations and provides the AUTHORITY with a clear overview of the overall risk picture.

AMC2 CAR-AAM.SB.200 – Security Risk Assessment

(a) The security elements of the integrated risk assessment should be consistent with the national aviation security risk assessment methodology established under the NCASP.

(b) Threats identified by the Sandbox Operator that may be relevant beyond its own operations should be provided to the AUTHORITY for consideration in the national aviation security risk register. Access to the register remains subject to the rules on sensitive security information.

CAR-AAM.SB.205 Risk Assessment Methodology

(a) For unmanned AAM operations, the Sandbox Operator shall use SORA 2.5, in the JARUS edition or the EASA AMC edition (ED Decision 2025/018/R), applied without mixing editions, or a later edition accepted by the AUTHORITY, and shall determine the intrinsic and final GRC, the initial and residual ARC, the SAIL, the containment requirements and the applicable OSOs. The edition used shall be stated in the application.

(b) For operations with persons on board, and for other operations not adequately covered by SORA, the Sandbox Operator shall use a structured methodology acceptable to the AUTHORITY that combines, as appropriate, functional hazard assessment, bow-tie analysis and quantitative safety objectives consistent with the airworthiness basis.

(c) Any adaptation of SORA, or the use of an alternative methodology, shall be justified, documented and approved as part of the Sandbox Approval.

(d) The risk assessment shall address the operating environment of the Sultanate of Oman, including high ambient temperatures, dust and sand, coastal humidity, mountainous terrain and GNSS interference.

AMC1 CAR-AAM.SB.205 – Applying SORA in AAM Sandbox Context

(a) When applying SORA, the Sandbox Operator should:

(1) define clearly the operational scenarios and boundaries for each phase;

(2) take due account of urban density, air traffic complexity and proximity to critical infrastructure;

(3) propose mitigations that are realistic, verifiable and compatible with the intended scale-up of operations; and

(4) address all relevant OSOs for the resulting SAIL, or propose alternative means with equivalent effect.

(b) Where adaptations to SORA are needed for AAM-specific features (vertiports, integrated UTM/ATM, passenger carriage), the Operator should explain:

(1) the adaptation;

(2) the rationale; and

(3) how equivalence of risk control is maintained.

GM1 CAR-AAM.SB.205 – Examples of Use

(a) For urban parcel delivery with BVLOS drones, SORA may be used to size buffers, define operational volumes, require geo-fencing and UTM strategic deconfliction, and specify contingency procedures.

(b) For emergency medical deliveries, SORA may be adapted to reflect higher tempo and time-critical mission profiles, with additional coordination mitigations with emergency services.

(c) For passenger-carrying eVTOL, SORA concepts may be combined with other safety assessment methods (e.g. functional hazard analysis, bow-tie analysis) as agreed with the AUTHORITY.

GM2 CAR-AAM.SB.205 – Simulation and Digital-Twin Tools

(a) Simulation, digital-twin and pre-flight assessment platforms may be used to support the SORA, to rehearse scenarios and to evaluate UTM, contingency and emergency concepts.

(b) Their outputs support, but do not replace, the risk assessment of the Sandbox Operator or the evaluation of the AUTHORITY. Model validity, input data quality and limitations should be stated wherever such outputs are relied upon.

(c) Where such a platform supports a safety-critical or mission-critical function, it is a DSP subject to CAR-AAM.SB.455.

CAR-AAM.SB.210 Safety Management System

(a) The Sandbox Operator shall implement and maintain a Safety Management System in accordance with CAR 100 and ICAO Annex 19, proportionate to the Complexity Level.

(b) The Safety Management System shall include:

(1) a safety policy and safety objectives signed by the Accountable Manager, including a just culture statement;

(2) safety risk management integrated with CAR-AAM.SB.200;

(3) safety assurance, including safety performance indicators with alert and target levels agreed with the AUTHORITY, internal audits and management of change;

(4) safety promotion, including training and communication; and

(5) an emergency response plan coordinated with CAR-AAM.SB.315 and CAR-AAM.SB.365.

(c) Where the Sandbox Operator already operates a Safety Management System under other CARs, it may extend that system to Sandbox activities, provided that AAM operations, aircraft, infrastructure and interfaces are explicitly within its scope and its processes address AAM-specific risks.

(d) The Safety Management System shall be documented in a safety management manual, or equivalent documentation, acceptable to the AUTHORITY.

(e) For Complexity Level L2 and L3 projects, the Sandbox Operator shall coordinate its Safety Management System with those of the vertiport operators, USSPs and ANSP on which it relies, and shall hold joint safety reviews with them at least every 6 months.

AMC1 CAR-AAM.SB.210 – Proportionality and SPIs

(a) For lower-complexity Sandbox projects, a simplified SMS may be acceptable, provided the core elements of CAR 100 are effectively in place.

(b) For higher-complexity projects, in particular those involving urban operations or passengers, the SMS should demonstrate:

(1) robust integration of safety risk management into operational decision-making;

(2) systematic collection and analysis of safety data; and

(3) structured safety review meetings with participation of senior management.

(c) The Sandbox Operator should define safety performance indicators (SPIs) for the Sandbox project, with target and alert levels agreed with the AUTHORITY.

GM1 CAR-AAM.SB.210 – Example SPIs

(a) SPIs for AAM Sandbox projects may include, for example:

(1) number of safety occurrences per flight or flight hour, by severity category;

(2) rate of C2 link loss events;

(3) number of airspace infringements or separation minima infringements;

(4) number of technical failures affecting critical systems;

(5) timeliness of safety reports and completion of corrective actions;

(6) GNSS interference events per flight hour;

(7) battery thermal events; and

(8) conformance monitoring alerts.

(b) These indicators can be consolidated into dashboards shared periodically with the AUTHORITY, in line with the reporting requirements defined in the Sandbox Approval.

CAR-AAM.SB.215 Occurrence Reporting and Investigation

(a) The Sandbox Operator shall establish a mandatory and voluntary occurrence reporting system.

(b) The Sandbox Operator shall report to the AUTHORITY:

(1) accidents and serious incidents immediately, by the quickest available means, and in accordance with CAR 13 to the accident investigation authority;

(2) other occurrences listed in CAD 01-02, in Appendix 2 or in the Sandbox Approval, within 72 hours of becoming aware of them;

(3) a follow-up report containing a preliminary analysis within 30 days; and

(4) a final report with root causes and corrective actions within 90 days, unless the AUTHORITY agrees otherwise.

(c) Occurrences with a security or cybersecurity dimension shall be flagged as such and shall, in addition, be reported to the competent security or cybersecurity authority within 24 hours, or within such shorter period as national law requires.

(d) The personnel of the Sandbox Operator and of its contractors shall report occurrences through the system. The Sandbox Operator shall ensure that its contracts require this.

(e) The Sandbox Operator shall analyse occurrences, identify root causes, implement corrective and preventive actions and review occurrence trends at least quarterly.

(f) Following an accident or serious incident, the Sandbox Operator shall preserve the AAM Aircraft, its recorders, remote pilot station data, OCC and UTM logs and C2 Link data until released by the accident investigation authority.

(g) The Sandbox Operator shall cooperate fully with the AUTHORITY and the accident investigation authority in any investigation.

AMC1 CAR-AAM.SB.215 – Reporting Channels

(a) Reports should be submitted in accordance with CAD 01-02, through the AUTHORITY's electronic reporting system or, until that system is available for AAM Sandbox reports, through the reporting channel designated by the AUTHORITY under AMC2 CAR-AAM.SB.100(a)(6), using a taxonomy compatible with the ICAO ADREP taxonomy.

(b) Standardised forms should be used to facilitate analysis and trend monitoring.

GM1 CAR-AAM.SB.215 – Reportable Events

(a) The mandatory list of reportable occurrences is contained in Appendix 2, Part B. It includes, in particular:

(1) unintentional loss of C2 Link beyond defined thresholds, or repeated C2 Link instability;

(2) activation of emergency or contingency procedures, including forced landing and degraded modes;

(3) unauthorised entry into controlled, restricted or prohibited airspace;

(4) significant deviation from approved routes, heights or Operational Volumes, and any geo-fence or containment breach;

(5) failures of UTM functions affecting safety or security;

(6) security breaches involving unauthorised access to aircraft, systems or operational data;

(7) GNSS jamming or spoofing;

(8) battery thermal runaway or venting;

(9) unintended automated behaviour and detect-and-avoid failures;

(10) loss of vertiport lighting, or FATO obstruction, during operations;

(11) dangerous goods occurrences; and

(12) environmental events judged relevant by the Sandbox Operator or the AUTHORITY.

(b) The AUTHORITY may specify additional reportable events for a particular Sandbox Project in its Sandbox Approval.

CAR-AAM.SB.220 Protection of Safety Data and Just Culture

(a) Safety data and safety information collected under this Regulation shall be used only for the purpose of maintaining or improving aviation safety, in accordance with ICAO Annex 19, Appendix 3.

(b) The Sandbox Operator shall not take disciplinary or other adverse action against a person on the basis of information reported by that person under CAR-AAM.SB.215, except in cases of gross negligence, wilful misconduct or criminal intent.

(c) The AUTHORITY will not use reported information to institute proceedings against the person who reported it, except in the cases referred to in paragraph (b) or where required by law.

(d) The Sandbox Operator shall adopt and communicate internally a just culture policy defining the boundary between acceptable and unacceptable behaviour.

(e) Information published under CAR-AAM.SB.140 and CAR-AAM.SB.610 shall be de-identified.

CAR-AAM.SB.225 Aviation Security

(a) The Sandbox Operator shall establish and implement a security programme, approved by the AUTHORITY, in compliance with the NCASP and, for operations carrying passengers, with the national civil aviation facilitation programme, taking into account the related guidance material issued by the AUTHORITY, and covering its AAM Aircraft, remote pilot stations, OCC, the vertiports and landing sites under its control, and its critical data.

(b) The security programme shall include, as applicable:

(1) access control to aircraft, remote pilot stations, OCC and airside areas;

(2) protection of aircraft and remote pilot stations against acts of unlawful interference and unauthorised use;

(3) screening of passengers, cabin baggage and hold baggage for flights with persons on board, to standards set by the AUTHORITY;

(4) security controls for cargo and mail;

(5) background checks for remote pilots, OCC personnel, maintenance personnel and other persons with unescorted access to critical systems or areas;

(6) security training;

(7) threat assessment and contingency plans, coordinated with law enforcement authorities; and

(8) protection of sensitive security information.

(c) The vertiport operator shall apply the security measures required by the NCASP for the category of the vertiport, in coordination with the Sandbox Operator.

(d) Cybersecurity is addressed under CAR-AAM.SB.460, with which the security programme shall be consistent.

GM1 CAR-AAM.SB.225 – Proportionality

(a) For Complexity Level L1 cargo operations, the security programme may be limited to access control, background checks and cargo acceptance controls.

(b) Passenger operations require screening equivalent to that applied at aerodromes for comparable flights, unless the AUTHORITY accepts an alternative on the basis of a security risk assessment.

GM2 CAR-AAM.SB.225 – Protection against Unauthorised Unmanned Aircraft

In assessing threats to vertiports, landing sites, OCCs and Sandbox operating areas, including threats from unauthorised unmanned aircraft, the Sandbox Operator and the vertiport operator may refer to the ICAO guidance on safeguarding civil aviation infrastructure against unmanned aircraft systems, including its risk assessment methodology toolkits.

SUBPART E – AIRWORTHINESS, REGISTRATION AND CONTINUING AIRWORTHINESS

CAR-AAM.SB.245 Registration and Identification

(a) No AAM Aircraft shall be operated under this Regulation unless it is registered in accordance with the applicable CARs implementing ICAO Annex 7 or, for unmanned aircraft within its scope, in accordance with CAA Decision No. 1412/2023.

(b) Each AAM Aircraft shall display its nationality and registration marks, or the identification required for unmanned aircraft, and shall carry an identification plate.

(c) Unmanned AAM Aircraft shall transmit remote identification, or equivalent electronic identification accepted by the AUTHORITY, throughout the flight.

(d) A foreign-registered AAM Aircraft may be used only with the written permission of the AUTHORITY and on the basis of a validated type certificate under CAR-AAM.SB.250(c)(2) or a Sandbox Flight Permit.

(e) The AUTHORITY may use an electronic registration and identification platform, including one operated by a third party under an arrangement with the AUTHORITY. Registration remains an act of the AUTHORITY, and the platform operator is subject to CAR-AAM.SB.455 and CAR-AAM.SB.465 in respect of the services it provides and the data it processes.

CAR-AAM.SB.250 Airworthiness Basis

(a) Each AAM Aircraft used in Sandbox operations shall have an airworthiness basis accepted by the AUTHORITY and documented in an Airworthiness Basis Declaration.

(b) The Airworthiness Basis Declaration shall identify the design standards, special conditions and means of compliance used, the limitations of the aircraft, and any deviations with their compensating measures.

(c) The airworthiness basis shall be one of the following:

(1) a type certificate or restricted type certificate issued under CAR 21;

(2) a foreign type certificate validated by the AUTHORITY;

(3) a Sandbox Flight Permit under CAR-AAM.SB.252; or

(4) for unmanned aircraft operated at SAIL I to IV, a design verification or declaration accepted by the AUTHORITY, proportionate to the SAIL and consistent with the design verification and declaration requirements of CAR-AAM.

(d) The airworthiness basis shall address, as applicable:

(1) energy storage and electric propulsion, including containment of thermal runaway;

(2) flight controls and automation, including the requirements of CAR-AAM.SB.280;

(3) C2 Link and detect-and-avoid performance;

(4) aircraft information security, protecting safety-critical systems against intentional unauthorised electronic interaction;

(5) operation in the environment of the Sultanate of Oman, including temperature, dust, sand and humidity; and

(6) noise, in accordance with CAR-AAM.SB.505.

(e) Passengers shall be carried only in an AAM Aircraft holding a type certificate issued or validated by the AUTHORITY under a certification basis providing a level of safety for occupants and third parties equivalent to that required for commercial air transport. No passenger shall be carried in an AAM Aircraft operating under a Sandbox Flight Permit or under paragraph (c)(4).

(f) The Airworthiness Basis Declaration shall be kept current and submitted with the application and with each Major Change.

AMC1 CAR-AAM.SB.250 – Acceptable Airworthiness Bases

(a) Depending on the nature of the AAM aircraft and the Sandbox project, the AUTHORITY may accept airworthiness bases such as:

(1) full or restricted type certificates issued in accordance with CAR 21 or equivalent foreign regulations;

(2) specific certification specifications, special conditions or means of compliance adopted for eVTOL or large RPAS by recognized authorities (e.g. EASA, FAA), adapted as necessary to the Omani context;

(3) experimental or provisional approvals with defined limitations, where the risk is controlled by a combination of technical and operational mitigations.

(b) The Sandbox Operator should provide a summary statement of compliance describing:

(1) the main standards or specifications used;

(2) key assumptions and limitations; and

(3) any open items or compensating measures relevant to safe operation in the Sandbox.

(c) In establishing or accepting a certification basis, the AUTHORITY may take into account, adapted to the conditions of the Sultanate of Oman:

(1) EASA Special Condition SC-VTOL-01 and its associated Means of Compliance, applying the Enhanced category for passenger carriage;

(2) the EASA Special Condition for Light Unmanned Aircraft Systems;

(3) FAA powered-lift airworthiness criteria;

(4) EUROCAE ED-202A/ED-203A or RTCA DO-326A/DO-356A for aircraft information security; and

(5) RTCA DO-311A for rechargeable lithium battery systems.

GM1 CAR-AAM.SB.250 – Examples

(a) Example – Certified Basis: An eVTOL aircraft holding a type certificate issued by another authority under a recognized certification basis may be accepted, subject to any additional limitations defined by the AUTHORITY for operations in Oman.

(b) Example – Experimental Basis: A prototype cargo RPAS may operate under a Sandbox Flight Permit issued under CAR-AAM.SB.252, with strict limitations on routes, altitude, weather conditions, population overflown and operational volumes, combined with enhanced monitoring and contingency procedures.

CAR-AAM.SB.252 Sandbox Flight Permit

(a) The AUTHORITY may issue a Sandbox Flight Permit for an AAM Aircraft that does not hold a type certificate or a validated type certificate, for the purpose of:

(1) development and experimental flight;

(2) showing compliance with a certification basis;

(3) training of flight crew for a type undergoing certification; or

(4) Sandbox demonstration flights without passengers.

(b) An application for a Sandbox Flight Permit shall be supported by:

(1) the proposed flight conditions, including configuration, limitations, operating area and procedures;

(2) a declaration by the design organisation, or by another entity accepted by the AUTHORITY, that the aircraft is capable of safe flight under those conditions, with supporting substantiation;

(3) the flight test programme and the qualifications of the test pilots and flight test engineers; and

(4) the assessment of risk to third parties.

(c) A Sandbox Flight Permit will specify the flight conditions, the persons who may be carried on board (limited to flight crew and essential test personnel), the areas and times of flight, and its validity, which shall not exceed 12 months.

(d) Flights under a Sandbox Flight Permit shall be conducted only over areas and at times that keep the risk to third parties within the accepted level, and not over congested areas unless specifically approved.

(e) Any change to the aircraft affecting the approved flight conditions requires a new or amended Sandbox Flight Permit.

GM1 CAR-AAM.SB.252 – Reference

The Sandbox Flight Permit is modelled on the permit-to-fly concept of EASA Part 21, Subpart P, and on the FAA experimental certificate.

CAR-AAM.SB.255 Continuing Airworthiness and Maintenance

(a) The Sandbox Operator is responsible for the continuing airworthiness of its AAM Aircraft and shall manage it in accordance with CAR-M and CAR 39, as determined applicable by the AUTHORITY.

(b) The Sandbox Operator shall:

(1) nominate a person responsible for continuing airworthiness;

(2) use a maintenance programme approved by the AUTHORITY, taking into account the airworthiness basis, the manufacturer's instructions and Sandbox-specific conditions;

(3) have maintenance performed by an organisation approved under CAR 145, or by another organisation accepted by the AUTHORITY, and certified by personnel qualified under CAR 66 or in a manner acceptable to the AUTHORITY;

(4) implement Airworthiness Directives and other mandatory continuing airworthiness instructions within the required periods;

(5) ensure that defects affecting safety are rectified before further flight, or deferred only in accordance with an MEL approved under CAR-MEL; and

(6) establish written arrangements defining the continuing airworthiness responsibilities of the manufacturer, the system integrator and the maintenance organisation.

(c) The Sandbox Operator shall maintain, for each AAM Aircraft, records of: configuration and software baseline; status of life-limited parts; battery state of health and cycles; maintenance, inspections and repairs; compliance with Airworthiness Directives and service bulletins; and reliability and health- monitoring data.

(d) The continuing airworthiness, Operational Control and Safety Management System functions shall exchange data on defects, occurrences and reliability.

AMC1 CAR-AAM.SB.255 – Maintenance Programme Content

(a) The maintenance programme for AAM aircraft used in Sandbox operations should, as a minimum, include:

(1) scheduled inspections and tasks, including intervals and tolerances;

(2) requirements for pre-flight, post-flight and periodic checks;

(3) component life limits and replacement criteria;

(4) procedures for dealing with defects and deferred defects;

(5) requirements for software updates, configuration control and functional tests; and

(6) enhanced tasks or checks where the design is experimental or operating under higher uncertainty.

(b) For highly automated or electric AAM aircraft, the maintenance programme should address, in particular:

(1) batteries and energy storage systems;

(2) flight control computers and software;

(3) critical sensors and C2 systems; and

(4) any systems essential for safe vertical take-off and landing.

(c) The maintenance programme should also address:

(1) acceptance, storage, charging, capacity testing, retirement and disposal criteria for batteries; and

(2) inspections following exposure to sand, dust or extreme heat.

GM1 CAR-AAM.SB.255 – Interfaces and Practical Considerations

(a) In many Sandbox projects, the airframe manufacturer or system integrator may play a key role in continuing airworthiness. The Sandbox Operator should ensure that responsibilities between the Operator, manufacturer and any maintenance organization are clearly defined in writing.

(b) The Sandbox Operator should consider using reliability or health-monitoring data (e.g. condition-based maintenance indicators) to support early identification of emerging technical issues, especially where the design is new or experimental.

CAR-AAM.SB.260 Design Changes and Configuration Control

(a) Any change to an AAM Aircraft, its systems or its software shall be classified as major or minor in accordance with CAR 21 or, for aircraft operating under a Sandbox Flight Permit or under CAR-AAM.SB.250(c)(4), in accordance with criteria approved by the AUTHORITY.

(b) A major design change shall not be embodied until approved by the AUTHORITY or, where applicable, by the State of Design. A major design change is also a Major Change under CAR-AAM.SB.180(d).

(c) The Sandbox Operator shall ensure that:

(1) the actual configuration of each aircraft, including software and firmware versions, is known and corresponds to the approved configuration;

(2) software and firmware updates are released only through a controlled process with integrity verification and rollback capability; and

(3) non-approved configurations are not used in operations.

(d) The Sandbox Operator shall maintain a modification log for each aircraft and shall reflect any resulting limitations in the CONOPS, risk assessment, Operations Manual and training.

AMC1 CAR-AAM.SB.260 – Categorization of Changes

(a) The Sandbox Operator should categorize changes as:

(1) major changes, which may significantly affect safety, performance, handling, reliability, energy systems, flight control, detect-and-avoid or C2 functions; and

(2) minor changes, which have limited impact and are within existing assumptions and mitigations.

(b) Major changes should normally be subject to prior acceptance or approval by the AUTHORITY and may require:

(1) updated design data or approvals under CAR 21 or equivalent;

(2) re-assessment of the risk analysis (including SORA where applicable); and

(3) revision of the Sandbox Approval conditions or limitations.

(c) Minor changes may be managed under the Operator's internal configuration control system, provided:

(1) they are recorded and assessed; and

(2) the conclusion that they are minor is justified and available for review by the AUTHORITY.

GM1 CAR-AAM.SB.260 – Examples of Changes

(a) Major change examples:

(1) introduction of a new propulsion system or major change to energy storage;

(2) changes to flight control laws affecting handling or stability;

(3) introduction of a new detect-and-avoid function or significant changes to C2 link architecture;

(4) significant MTOW increase or change in mission profile affecting performance margins.

(b) Minor change examples:

(1) non-critical interior or payload mounting modifications within established limits;

(2) minor software updates not affecting safety-critical functions, as justified by the design organization and accepted by the Operator's configuration control process.

CAR-AAM.SB.265 Airworthiness Records and Reporting

(a) The Sandbox Operator shall retain airworthiness and maintenance records for the longest of: the periods required by CAR-M and CAR 145; 24 months after the end of the Sandbox Project; or the closure of any related investigation.

(b) When an AAM Aircraft leaves the Sandbox, its records shall be transferred with it.

(c) Technical occurrences shall be reported in accordance with CAR-AAM.SB.215, and the Sandbox Operator shall also inform the design organisation or type certificate holder.

(d) The Sandbox Operator shall cooperate with the AUTHORITY, the State of Design, manufacturers and maintenance organisations in resolving airworthiness issues identified during Sandbox operations.

AMC1 CAR-AAM.SB.265 – Record Retention and Data Use

(a) As guidance, the Sandbox Operator should retain:

(1) essential aircraft records and modification history at least for the duration of the Sandbox project plus a period defined by the AUTHORITY;

(2) critical reliability, defect and failure data for the duration required to support trend analysis and, where relevant, the development of permanent regulation or approvals.

(b) The Operator should ensure that airworthiness and operational data are used not only to keep individual aircraft airworthy, but also to:

(1) identify systemic issues;

(2) inform updates to the risk assessment; and

(3) support lessons learned and close-out reporting for the Sandbox.

GM1 CAR-AAM.SB.265 – Practical Integration

(a) In practice, close coordination between continuing airworthiness, operations and SMS functions can be achieved through:

(1) joint review meetings on technical occurrences and trends;

(2) shared access to defect and reliability databases; and

(3) coordinated definition of technical SPIs (e.g. critical failure rates, dispatch reliability).

(b) For new AAM aircraft types, this integration is particularly important to rapidly detect emerging issues and adjust mitigations and limitations during Sandbox operations.

CAR-AAM.SB.280 Automation and Artificial Intelligence

(a) Where an AAM Aircraft or its operation uses automated functions that perform safety-related tasks, the Sandbox Operator shall declare, for each such function:

(1) the function and its Automation Level;

(2) its ODD and the means of detecting exit from the ODD;

(3) the role and authority of the pilot or remote pilot, including the means and time available to intervene;

(4) the human-machine interface and its human factors evaluation; and

(5) the fallback behaviour in the event of failure or ODD exit.

(b) Functions using machine learning shall be supported by learning assurance evidence covering data management, model training, verification, and performance and robustness within the ODD.

(c) Machine learning models shall not change their behaviour in service unless the change has been approved as a Major Change.

(d) Functions performing safety-critical tasks without real-time human intervention shall be approved only for Complexity Level L3 projects and only after completion of a demonstration programme accepted by the AUTHORITY.

(e) The Sandbox Operator shall record automated decisions and their triggering inputs to the extent necessary to reconstruct events.

AMC1 CAR-AAM.SB.280 – Automation Levels

The Sandbox Operator should classify automated functions using the EASA scheme of Level 1 (assistance to the human), Level 2 (human-AI teaming) and Level 3 (advanced automation), including its sub-levels.

GM1 CAR-AAM.SB.280 – References

Relevant references include the EASA Artificial Intelligence Roadmap 2.0, the EASA concept papers providing guidance for machine learning applications, and JARUS guidance on automation.

SUBPART F – FLIGHT OPERATIONS, PERSONNEL AND OPERATIONAL CONTROL

CAR-AAM.SB.300 General Operating Requirements

(a) The Sandbox Operator shall conduct Sandbox operations only within the scope, areas, Operational Volumes, phases and limitations of its Sandbox Approval, and in accordance with CAR 180, including Appendix 4, and with any applicable LOA or ICD.

(b) The Sandbox Operator shall establish an Operations Manual, acceptable to the AUTHORITY, that translates the CONOPS and risk assessment into procedures, and shall make the relevant parts available to, and ensure they are understood by, all operational personnel.

(c) Before each flight, the Sandbox Operator shall ensure that:

(1) the flight is within the approved envelope for aircraft, mass, performance, environment and Operational Volume;

(2) the meteorological conditions, including wind, gusts, temperature, visibility, dust and sand, are within the aircraft and operating limitations;

(3) the required infrastructure and services, including vertiports, landing sites, UTM, C2 Link and communications, are available and serviceable;

(4) NOTAM, airspace status, obstacles, geo-zones and local restrictions have been reviewed; and

(5) flight planning in accordance with CAR-AAM.SB.330 has been completed.

(d) Passengers, dangerous goods or external loads shall be carried only where explicitly authorised in the Sandbox Approval.

(e) The Sandbox Operator shall not operate an AAM Aircraft with inoperative instruments or equipment except as permitted by an MEL approved by the AUTHORITY.

AMC1 CAR-AAM.SB.300 – Operations Manual and Operating Envelope

(a) The Sandbox Operator should compile its operational policies and procedures in an operation manual (or equivalent) covering, as a minimum:

(1) organizational structure and responsibilities;

(2) description of AAM aircraft and systems;

(3) normal, abnormal and emergency procedures;

(4) route and area information, including operational volumes and constraints;

(5) mission planning and flight authorization procedures;

(6) communication procedures (including with OCC, ANS and UTM);

(7) crew/remote pilot duties and limitations;

(8) the MEL;

(9) the energy policy;

(10) passenger handling procedures;

(11) the dangerous goods policy; and

(12) procedures for hot weather, dust and sand, and GNSS interference.

(b) The Operator should clearly define an initial operating envelope (e.g. altitude, speed, weather limits, population density constraints) for each phase, and any conditions under which the envelope may be expanded, consistent with the Sandbox Approval.

GM1 CAR-AAM.SB.300 – Example Initial Restrictions

(a) As an example, for an early pilot phase the AUTHORITY may impose:

(1) daylight operations only;

(2) operations in VMC with minimum visibility and cloud base;

(3) limitations on overflight of populated or sensitive areas; and

(4) reduced maximum number of simultaneous AAM aircraft in the air.

(b) These limitations may be progressively relaxed in later phases if supported by data and satisfactory safety performance.

CAR-AAM.SB.305 Operational Control and Operations Control Centre

(a) The Sandbox Operator shall exercise Operational Control over every flight and shall define who may authorise, continue, divert and terminate a flight.

(b) The Sandbox Operator shall establish an OCC scaled to the Complexity Level, with at least the following capabilities:

Level	Minimum OCC capability
L1	Nominated operational controller; basic tracking and communications; documented flight release
L2	Dedicated OCC function during operating hours; continuous tracking with alerting; structured coordination with ATS, USSP and vertiport operators; duty handover procedures
L3	OCC continuously staffed whenever aircraft are airborne; redundant critical systems and a tested backup capability; automated conformance monitoring and alerting; integrated ATS and USSP coordination and incident management

(c) For every operation, the Sandbox Operator shall have: real-time positional awareness, or position reporting at intervals approved by the AUTHORITY; monitoring of C2 Link status with validated lost-link procedures; monitoring of weather, NOTAM and airspace status; and an immediately available coordination channel with the relevant ATS unit and USSP.

(d) The Sandbox Operator shall define the roles of OCC personnel, their workload limits, the maximum number of aircraft per remote pilot or supervisor, and the interfaces with the maintenance and Safety Management System functions.

(e) OCC arrangements shall be exercised before each phase and at least every 12 months.

(f) Two or more Sandbox Operators, or a Programme Coordination Office, may use a Shared OCC Facility, provided that:

(1) each Sandbox Operator continues to meet paragraphs (a) to (e) and retains Operational Control of its flights;

(2) the allocation of functions, personnel, systems and decision authority between the users of the facility is defined in an ICD or written agreement acceptable to the AUTHORITY; and

(3) the coordination of the facility with ATS, USSPs, meteorological services and emergency services is described in the LOA and ICD required by CAR-AAM.SB.400.

AMC1 CAR-AAM.SB.305 – OCC Proportionality and Functions

(a) For small, low-complexity Sandbox projects, the operational control function may be performed by a suitably qualified person or small team, provided that:

(1) planning, authorization and monitoring responsibilities are clearly defined; and

(2) the person or team is not overloaded by other duties that could compromise safety.

(b) For larger or more complex operations, the OCC should at least:

(1) maintain an up-to-date overview of all active missions and aircraft;

(2) monitor relevant airspace information and UTM/ANS data feeds;

(3) track environmental constraints (e.g. weather, temporary restricted areas);

(4) record key operational decisions and communication; and

(5) support post-flight analysis and debriefing.

GM1 CAR-AAM.SB.305 – Example Operational Control Workflow

(a) A typical workflow may include:

(1) mission request → planning → risk check vs CONOPS and approval conditions;

(2) OCC validation and mission/flight release;

(3) active monitoring of flight/mission progress and constraints;

(4) intervention or recall if conditions change or limits are approached;

(5) post-mission debriefs and data capture.

(b) Digital tools may be used to support planning, monitoring and logging, provided that their reliability, integrity and cyber security are appropriately managed.

CAR-AAM.SB.310 Personnel Licensing, Competence and Fitness

(a) The Sandbox Operator shall ensure that every pilot, remote pilot, OCC controller and other person performing safety-critical duties:

(1) holds the licence, rating, certificate or authorisation required by this rule and other CARs;

(2) has completed initial training and a proficiency check before being assigned to duty;

(3) completes recurrent training and checking at least every 12 months, and after any Major Change affecting the role; and

(4) is current on the type, area and procedures.

(b) Remote pilots shall hold a remote pilot licence or certificate issued by the AUTHORITY. For Complexity Level L2 and L3 projects, where no appropriate licence category yet exists, the AUTHORITY will issue a Sandbox Remote Pilot Authorisation following completion of a competency-based training and assessment programme approved by the AUTHORITY.

(c) A pilot on board an AAM Aircraft carrying passengers shall hold a licence issued or validated by the AUTHORITY with the appropriate aircraft category, including powered-lift where applicable, and type rating, and a Class 1 medical certificate.

(d) Flights under a Sandbox Flight Permit shall be conducted by test pilots whose qualifications are accepted by the AUTHORITY.

(e) Personnel communicating with ATS shall hold language proficiency at ICAO Level 4 or higher.

(f) Remote pilots shall hold a medical certificate of at least Class 3, or as otherwise specified by the AUTHORITY for the Complexity Level.

(g) The Sandbox Operator shall keep training, checking, licensing and medical records for each person for at least 36 months after the person leaves the role.

(h) Where a remote pilot competence certificate or licence under CAR-AAM appropriate to the operation is available, it satisfies paragraph (b). Sandbox Remote Pilot Authorisations are converted in accordance with CAR-AAM.SB.657.

AMC1 CAR-AAM.SB.310 – Training Programme Content

(a) Training programmes for crew and remote pilots should cover, as applicable:

(1) AAM aircraft systems, performance and limitations;

(2) normal operating procedures, including mission planning and communication;

(3) abnormal and emergency procedures (e.g. loss of C2 link, degraded modes, emergency landing);

(4) airspace structure, operational volumes, interaction with ANS and UTM;

(5) human factors, including workload management and situational awareness;

(6) security awareness (e.g. cyber hygiene, protection of critical data and systems);

(7) environmental considerations and constraints, where relevant;

(8) automation management and mode awareness;

(9) energy management;

(10) operations in hot weather, dust and sand, and GNSS interference;

(11) passenger handling, where applicable; and

(12) dangerous goods awareness.

(b) Training should include both theoretical and practical elements, including simulations and, where feasible, supervised live operations, before unsupervised operational duties are assigned.

(c) Recurrent training and checks should be conducted at intervals acceptable to the AUTHORITY, and after significant changes in aircraft, systems or procedures.

GM1 CAR-AAM.SB.310 – Competency Matrix

(a) The Sandbox Operator may develop a competency matrix listing the required competencies for each role (e.g. remote pilot, OCC controller, supervisor), such as:

(1) system knowledge;

(2) mission planning;

(3) communication and coordination;

(4) abnormal and emergency handling;

(5) use of UTM/ANS tools; and

(6) safety and security reporting.

(b) This matrix can be used to structure training, assessment and authorization of personnel, and to identify specific training needs when roles or systems change.

(c) Relevant references include ICAO Annex 1, ICAO Doc 10019 (Manual on RPAS), ICAO Doc 9868 (PANS-TRG) for competency-based training and assessment, and the EASA Part-FCL provisions for powered-lift.

CAR-AAM.SB.315 Emergency, Contingency and Abnormal Procedures

(a) The Sandbox Operator shall establish emergency, contingency and abnormal procedures consistent with the risk assessment and the Sandbox Approval, addressing at least:

(1) loss or degradation of the C2 Link;

(2) loss or degradation of navigation, including GNSS jamming and spoofing, and of surveillance;

(3) conflicting traffic and airspace infringements;

(4) system failures affecting controllability, including propulsion and energy storage failures and battery thermal events;

(5) exit from the ODD and unexpected automated behaviour;

(6) loss of UTM or OCC services;

(7) emergencies at vertiports or landing sites, including fire, obstruction or crowding;

(8) security incidents; and

(9) weather and environmental hazards, including sandstorms, extreme heat, convective activity and wildlife.

(b) The procedures shall define flight termination, emergency landing sites and containment actions, and shall be coordinated with the ANSP, USSPs, vertiport operators and emergency services.

(c) The Sandbox Operator shall integrate the procedures into the Operations Manual, training and OCC checklists.

(d) The Sandbox Operator shall conduct a tabletop exercise before each phase and, for Complexity Level L2 and L3 projects, a live or simulated exercise with external stakeholders at least every 12 months.

AMC1 CAR-AAM.SB.315 – Minimum Set of Procedures and Exercises

(a) As a minimum, the Operator should establish procedures for:

(1) predefined actions in case of C2 loss (e.g. lost link profiles, safe landing or return-to-home);

(2) controlled termination of operations when critical systems degrade;

(3) communication and coordination protocols in emergencies;

(4) evacuation or securing of vertiports/landing sites when required; and

(5) reporting and initial response to security incidents.

(b) The Operator should perform periodic exercises, which may include:

(1) table-top exercises with internal teams and external stakeholders;

(2) simulations of critical failures and responses; and

(3) where practicable, live drills in coordination with emergency services and vertiport operators.

GM1 CAR-AAM.SB.315 – Scenario Examples

(a) Example scenarios for drills and training may include:

(1) C2 link loss in an urban corridor with predefined contingency routes and landing sites;

(2) aborted approach to a vertiport due to unexpected obstacle or intrusion;

(3) UTM system outage requiring fallback to predefined procedures and coordination with ATS;

(4) suspected security compromise of an OCC workstation, requiring isolation and switch-over;

(5) GNSS spoofing in a corridor near a critical site, requiring detection, containment and coordination with ATS and security authorities.

(b) Lessons learned from exercises and real events should feed back into procedure updates, training programmes and the risk assessment.

CAR-AAM.SB.320 Flight Time, Duty and Fatigue Management

(a) The Sandbox Operator shall establish flight time, duty and rest limits for pilots, remote pilots and OCC personnel, acceptable to the AUTHORITY, based on the applicable CARs or, where none apply, on scientific principles and the workload of the operation.

(b) The Sandbox Operator shall monitor compliance, record duty and rest, allow personnel to declare themselves unfit for duty without penalty, and review fatigue reports within its Safety Management System.

(c) No person shall perform safety-critical duties while under the influence of psychoactive substances. The Sandbox Operator shall establish a policy on testing consistent with national law.

AMC1 CAR-AAM.SB.320 – Fatigue Management Approach

(a) Depending on the scale and complexity of operations, the Operator may use:

(1) a prescriptive duty time and rest scheme; or

(2) a more advanced fatigue risk management approach, if acceptable to the AUTHORITY.

(b) Duty and rest rules should take into account:

(1) workload characteristics of AAM operations (including remote operations and monitoring);

(2) time of day, duration and intensity of missions; and

(3) additional cognitive load linked to new systems and procedures.

GM1 CAR-AAM.SB.320 – Practical Measures

(a) Practical measures may include:

(1) clear policies allowing crew and remote pilots to declare unfitness for duty without undue pressure;

(2) limits on the number of consecutive missions or hours under high workload conditions; and

(3) periodic review of fatigue reports or indications as part of SMS.

(b) For Complexity Level L1 projects with limited operating hours, a simple written duty and rest policy, combined with the fitness-for-duty declaration required by CAR-AAM.SB.320(b), is normally sufficient to meet CAR-AAM.SB.320(a).

CAR-AAM.SB.325 Dangerous Goods

(a) Dangerous goods shall be carried only where authorised in the Sandbox Approval and in accordance with ICAO Annex 18, the ICAO Technical Instructions (Doc 9284) and the applicable CARs.

(b) A Sandbox Operator not authorised to carry dangerous goods shall establish procedures to prevent their inadvertent carriage, including in passenger baggage and cargo.

(c) A Sandbox Operator authorised to carry dangerous goods shall establish procedures for acceptance, handling, loading, emergency response and reporting, and shall train its personnel accordingly.

(d) Lithium batteries carried as cargo, and spare aircraft batteries transported between sites, are subject to this rule.

(e) Dangerous goods accidents and incidents shall be reported in accordance with CAR-AAM.SB.215.

GM1 CAR-AAM.SB.325 – Medical Deliveries

Many medical payloads, such as diagnostic specimens, dry ice and certain medicines, are classified as dangerous goods. Operators should classify intended payloads before submitting their application.

CAR-AAM.SB.330 Flight Planning, Energy Management and Passengers

(a) The Sandbox Operator shall establish an energy policy ensuring that each flight is planned with sufficient usable energy to:

(1) complete the flight to the intended landing site;

(2) cover contingencies;

(3) proceed to an alternate landing site, where one is required; and

(4) land with at least the Final Reserve Energy.

(b) Energy planning shall take into account battery state of health, temperature, ageing, heat-soak and cold- soak effects, and hover and holding requirements.

(c) An alternate vertiport or landing site shall be planned for every flight with persons on board, and for other flights where required by the risk assessment. Emergency landing sites shall be identified along each route.

(d) The Sandbox Operator shall establish mass and balance procedures and shall verify that each flight is conducted within limits.

(e) Where passengers are carried, the Sandbox Operator shall ensure that:

(1) passengers receive a safety briefing before each flight, covering emergency exits, restraint and conduct;

(2) passengers are seated and restrained during take-off and landing and whenever directed;

(3) assistance procedures exist for persons with reduced mobility and for unaccompanied minors;

(4) passenger movements at vertiports are supervised; and

(5) a passenger manifest is kept and made available to emergency services.

AMC1 CAR-AAM.SB.330 – Final Reserve Energy

Until the AUTHORITY publishes values for a particular type, the Final Reserve Energy should be not less than the energy required to fly for 20 minutes at best-endurance speed by day and for 30 minutes by night, or an equivalent level established from type data and accepted by the AUTHORITY.

GM1 CAR-AAM.SB.330 – Reference

Relevant reference: Commission Implementing Regulation (EU) 2024/1111 on operations with manned VTOL- capable aircraft.

SUBPART G – VERTIPORTS, LANDING SITES AND GROUND INFRASTRUCTURE

CAR-AAM.SB.350 Vertiport and Landing Site Authorisation and Design

(a) No vertiport or AAM Landing Site shall be used in Sandbox operations unless the AUTHORITY has:

(1) certified it under CAR 139, where it is open to public passengers or located at a certified aerodrome; or

(2) otherwise authorised it for Sandbox use, with conditions, following a design and operational assessment.

(b) The design of a vertiport or landing site shall provide, as a minimum:

(1) a FATO, TLOF and safety area dimensioned for the most demanding AAM Aircraft using the site;

(2) obstacle limitation surfaces, or equivalent protection accepted by the AUTHORITY, and a process to protect them from new obstacles;

(3) approach and departure paths assessed for obstacles and for the effects of downwash and outwash on persons and property;

(4) markings, signs, lighting and visual aids appropriate to the intended operations (day or night, VFR or IFR), and a wind indicator;

(5) separation of passenger, staff and emergency service flows from the movement area;

(6) energy and charging infrastructure meeting CAR-AAM.SB.352;

(7) rescue and firefighting provisions meeting CAR-AAM.SB.365; and

(8) for elevated sites, structural capacity, emergency egress and fire protection verified by the competent building authority.

(c) The design shall take account of the local climate, including the effect of surface temperature on persons and aircraft, the accumulation of sand and dust, and the control of foreign object debris.

(d) A vertiport located at an aerodrome shall be integrated with the aerodrome's operations, procedures and Safety Management System.

(e) The vertiport or landing site shall comply with applicable national legislation, building and safety codes and land-use requirements.

AMC1 CAR-AAM.SB.350 – Use of International Guidance (EASA / FAA)

(a) When designing vertiports and landing sites for AAM Sandbox operations, the AUTHORITY and stakeholders may, where appropriate and consistent with the Civil Aviation Law and CARs, take into account:

(1) ICAO Annex 14, Volume II – Heliports, and related guidance material;

(2) EASA Prototype Technical Design Specifications for Vertiports (PTS-VPT-DSN), as non-regulatory technical guidance for VFR vertiports;

(3) FAA Engineering Brief No. 105 / 105A “Vertiport Design”, as interim design guidance for vertiports serving VTOL aircraft.

(b) Such material should be used as reference guidance only, and does not apply automatically. Where used, the Operator or infrastructure developer should:

(1) identify which elements are adopted or adapted; and

(2) demonstrate that the resulting design provides an acceptable level of safety in the national context.

(c) Where EASA/FAA criteria are used, the underlying assumptions (e.g. design VTOL aircraft, performance envelopes, downwash) should be verified as compatible with the AAM aircraft actually operating in the Sandbox.

GM1 CAR-AAM.SB.350 – Key Design Elements

(a) Typical design elements for vertiports and landing sites include, as applicable:

(1) touchdown and lift-off area (TLOF);

(2) final approach and take-off area (FATO);

(3) safety area(s) surrounding FATO/TLOF;

(4) obstacle limitation or protection surfaces;

(5) passenger and crew access routes;

(6) rescue and firefighting access and staging areas;

(7) markings, lights and visual aids; and

(8) fencing, access control and protection against unauthorized entry.

(b) For rooftop or elevated vertiports, additional structural and emergency egress considerations are normally required (e.g. structural load capacity, fire-fighting access, evacuation routes).

CAR-AAM.SB.352 Energy and Charging Infrastructure

(a) Charging, battery-swapping and battery storage facilities, and any hydrogen or other energy infrastructure, shall:

(1) comply with the applicable national electrical, fire and building codes;

(2) be compatible with the aircraft manufacturer's specifications;

(3) include protection against overcharge, short circuit and thermal events, with an emergency shutdown accessible to staff and fire services; and

(4) be inspected and maintained under a documented programme.

(b) Damaged or suspect batteries shall be quarantined in a designated safe area.

(c) Charging during passenger boarding or with persons on board is prohibited unless approved by the AUTHORITY on the basis of a specific risk assessment.

CAR-AAM.SB.355 Vertiport and Landing Site Operator

(a) Each vertiport and landing site shall have an identified operator acceptable to the AUTHORITY, which may be the Sandbox Operator. Where the vertiport operator is not the Sandbox Operator, their respective responsibilities shall be set out in a written agreement.

(b) The vertiport operator shall be responsible for:

(1) the safe day-to-day operation, inspection and maintenance of the site;

(2) a Safety Management System proportionate to the site, coordinated with that of the Sandbox Operator;

(3) ground operations, passenger handling, and control of foreign object debris and wildlife;

(4) access control and security in accordance with CAR-AAM.SB.225(c);

(5) coordination with AAM operators, the ANSP, USSPs and emergency services;

(6) reporting occurrences in accordance with CAR-AAM.SB.215; and

(7) providing site data for aeronautical publication under CAR-AAM.SB.415.

(c) The vertiport operator shall establish a vertiport operations manual acceptable to the AUTHORITY.

AMC1 CAR-AAM.SB.355 – Contents of Vertiport / Landing Site Operations Manual

(a) The operations manual for a vertiport or landing site used in AAM Sandbox operations should include, as a minimum:

(1) description of the site, layout and key infrastructure, including drawings;

(2) description of critical areas (TLOF, FATO, safety areas, obstacle environment);

(3) operating procedures (arrival, departure, ground movements, turnarounds);

(4) local rules for passenger and ground staff movement (where applicable);

(5) inspection and maintenance procedures, including frequency and responsibilities;

(6) procedures for reporting and correcting defects and hazards;

(7) emergency and contingency procedures, including communication with AAM operators, ANS/UTM and emergency services; and

(8) arrangements for control of access and security on the site.

(b) The manual may be integrated into the documentation of an existing aerodrome, where the vertiport forms part of that aerodrome, provided the AAM-specific aspects are clearly identified.

(c) The manual should also include charging procedures, battery quarantine arrangements, and procedures for hot weather, dust and sand.

GM1 CAR-AAM.SB.355 – Local SMS and Coordination

(a) For small, low-intensity sites, a simplified local SMS may be sufficient, focusing on:

(1) hazard reporting and follow-up;

(2) regular inspections and defect correction;

(3) simple safety performance indicators (e.g. number of ground incidents, FOD findings).

(b) For larger or more complex vertiports (e.g. urban hubs), more structured SMS arrangements may be needed, including:

(1) formal safety committees;

(2) more detailed risk assessments (e.g. downwash effects, pedestrian movements, multi-operator interfaces); and

(3) systematic coordination with city authorities, emergency services and AAM operators.

CAR-AAM.SB.360 Integration with the Urban and Non-Urban Environment

(a) The planning, design and use of ground infrastructure shall be coordinated with the competent planning and municipal authorities to ensure compatibility with land-use policies, protection of critical infrastructure and sensitive sites, and safe access for passengers, staff and emergency services.

(b) The Sandbox Operator and the vertiport operator shall assess, in cooperation with the relevant authorities:

(1) the proximity of sites to residential areas, schools, hospitals, places of worship, critical infrastructure and environmentally sensitive areas;

(2) ground risk beneath flight paths and at emergency landing sites;

(3) integration with other transport modes;

(4) utilities, energy supply and data connectivity; and

(5) environmental effects under Subpart J.

(c) For operations in congested areas, the AUTHORITY may require ground risk modelling, protection zones around corridors and vertiports, and structured community engagement.

(d) Temporary infrastructure shall be removed or made safe at the end of the Sandbox Project in accordance with CAR-AAM.SB.615, unless approved for continued use.

AMC1 CAR-AAM.SB.360 – Land-Use and Urban Planning Interface

(a) When identifying candidate sites for vertiports and landing areas in an AAM Sandbox project, the Operator and relevant authorities should:

(1) consult existing master plans, urban development plans and zoning rules;

(2) assess compatibility of AAM operations with planned land use and development projects; and

(3) identify any constraints related to building heights, public spaces, traffic flows or environmental protection.

(b) For projects that may serve as pilots for future large-scale deployment, the planning process should explicitly consider how temporary Sandbox infrastructure could evolve into permanent facilities, or be safely decommissioned at the end of the Sandbox.

GM1 CAR-AAM.SB.360 – Practical Examples

(a) Examples of integration aspects to be addressed:

(1) ensuring that vertiport access roads do not create uncontrolled pedestrian flows across safety-critical areas;

(2) coordinating vertiport location and routing to avoid overflight of sensitive public events or crowd concentrations;

(3) aligning vertiport signage and information with local public transport branding to support user comprehension and adoption.

(b) International experience, including demonstration projects and guidance associated with EASA vertiport specifications and FAA vertiport engineering briefs, may be used as non-binding reference for Oman when considering layout options, obstacle protection strategies and passenger flow concepts, provided alignment with national law and CARs is maintained.

CAR-AAM.SB.365 Emergency Preparedness, Rescue and Firefighting

(a) The vertiport operator, in coordination with the Sandbox Operator and the emergency services, shall establish an emergency plan appropriate to the site and to the aircraft using it.

(b) The emergency plan shall address:

(1) rescue and firefighting capability appropriate to the aircraft and energy systems used, including extended cooling of lithium battery fires and management of toxic smoke and contaminated run-off;

(2) emergency access routes and staging areas;

(3) on-site emergency equipment, its quantity and its maintenance;

(4) alerting, communication and coordination with AAM operators, ATS, USSPs and emergency services;

(5) response to accidents in the vicinity of the site and along routes; and

(6) passenger evacuation and medical response.

(c) The emergency plan shall be approved or accepted by the civil defence authority and shall be exercised before the first operation and at least every 12 months. A full-scale exercise shall be held at least every 24 months at sites with public passenger access.

AMC1 CAR-AAM.SB.365 – Coordination with National Requirements

(a) In defining rescue and firefighting and emergency response arrangements, the vertiport/landing site operator should:

(1) comply with any applicable national RFFS and fire safety requirements;

(2) take account of guidance in ICAO Annex 14, Volume II, and relevant national implementations; and

(3) consider specific hazards of AAM aircraft (e.g. battery fires, high-voltage systems, composite materials).

(b) Exercises may include tabletop and, where feasible, live drills, involving all relevant stakeholders (vertiport staff, AAM operators, emergency and security services).

(c) Emergency responders should receive type-specific training on high-voltage isolation and battery hazards from the manufacturer or the Sandbox Operator.

GM1 CAR-AAM.SB.365 – Example Scenarios

(a) Example emergency scenarios for planning and exercises:

(1) rejected landing or hard landing on the vertiport, with minor injuries and aircraft damage;

(2) fire or smoke from an AAM aircraft during charging or turnaround;

(3) medical emergency involving a passenger in the vertiport area;

(4) security-related incident (e.g. unauthorized access to aircraft or critical systems).

(b) Lessons learned from exercises and real events should be fed back into emergency plans, training programmes and the Sandbox risk assessment.

SUBPART H – AIR NAVIGATION SERVICES, UTM, CNS AND METEOROLOGY

CAR-AAM.SB.400 Coordination with the ANSP and ATS Units

(a) Operations in controlled airspace, in aerodrome traffic zones, in the vicinity of ATS routes, or in any other airspace where the ANSP so requires, shall be coordinated with the ANSP in accordance with CAR 172 and CAR 180.

(b) The Sandbox Operator and the ANSP shall conclude a Letter of Agreement (LOA) or, for operations meeting the conditions of AMC1 CAR-AAM.SB.400(b), an equivalent written arrangement accepted by the ANSP and the AUTHORITY, and shall maintain an Interface Control Document (ICD) before such operations begin.

(c) The LOA and ICD shall address, as a minimum:

(1) airspace structures, volumes and corridors, and their activation and deactivation rules;

(2) the separation or segregation concept in relation to IFR and VFR traffic, and responsibility for it;

(3) the submission of flight intent, authorisation and conformance monitoring;

(4) identification, call signs and transponder or ADS-B codes;

(5) communication procedures and phraseology;

(6) contingency and emergency procedures consistent with CAR-AAM.SB.315, distinguishing C2 Link loss, UTM or OCC outage, surveillance degradation and ATS radiocommunication failure, with the related notification, fallback and recovery arrangements and last-resort actions;

(7) occurrence coordination and joint review; and

(8) configuration baselines, change coordination, release windows and rollback procedures.

(d) Civil-military coordination shall be arranged through the AUTHORITY with the Royal Air Force of Oman where operations affect military airspace or activities.

(e) Sandbox operations shall not adversely affect the safety or efficiency of other airspace users or the ability of the ANSP to provide services in accordance with CAR 172.

(f) A Sandbox Approval does not replace the prior written approval of the AUTHORITY required under CAR 172 or CAR 180 for ATS trials or for changes to airspace organisation, ATS procedures, systems, equipment or facilities. The AUTHORITY will process both approvals in a coordinated manner.

(g) Sandbox operations shall not be conducted within prohibited, restricted or danger areas, military training areas or other special use airspace published in the AIP or by NOTAM, unless authorised in the Sandbox Approval with the agreement of the controlling or responsible authority.

AMC1 CAR-AAM.SB.400 – Letters of Agreement (LOAs), Coordination Arrangements and Interface Control Document (ICD)

(a) Letters of Agreement (LOAs), or equivalent written arrangements between the Sandbox Operator and the ANSP/ATS units concerned, should normally include, as applicable:

(1) the scope of operations covered (types of flights, airspace, locations and times);

(2) the responsibilities and decision rights of each party;

(3) procedures for flight/mission planning, notification and authorization;

(4) in-flight coordination procedures, including transfer of control, handover and provision of traffic information or advisories;

(5) contingency and emergency procedures, including loss of C2 link, unexpected intruder traffic, loss or degradation of ATS/UTM systems and any agreed last-resort actions; and

(6) arrangements for post-event review, including debriefing of significant occurrences and periodic review meetings.

(b) For lower-risk operations that do not interact with controlled or ATS-managed traffic (for example, low-level flights fully segregated from other airspace users), simpler forms of coordination arrangements may be acceptable, subject to the ANSP's agreement and provided that the segregation conditions are clearly defined and maintained.

(c) In addition to the LOA or equivalent arrangement, the parties should maintain an Interface Control Document (ICD) that defines the operational and technical interfaces between the Sandbox Operator, ANSP/ATS units and, where applicable, UTM service providers. The ICD should normally cover:

(1) the definition of airspace volumes, including activation and deactivation rules, responsibilities for airspace management (ASM) and any ATFM implications where applicable;

(2) communication and coordination procedures for normal, contingency and emergency situations, including points of contact and escalation paths;

(3) information exchanges, including flight intent data, authorization status, tracking information, constraints, advisories and any relevant system status indicators;

(4) degraded modes and fail-safe behaviours, including UTM or OCC outages, communications loss, surveillance degradation and fallback arrangements;

(5) incident and occurrence coordination, including reporting timelines, responsibilities for initial and detailed investigation and interfaces with the AUTHORITY; and

(6) change coordination, including configuration baselines (versions), planned release windows and rollback procedures for operational and technical changes that may affect the interface.

GM1 CAR-AAM.SB.400 – Typical Operational Concepts

(a) Depending on the environment, AAM Sandbox operations may use concepts such as:

(1) segregated corridors or volumes, with defined vertical and lateral limits;

(2) integrated operations in controlled airspace, with ATS providing separation or traffic information;

(3) time-based access windows to mitigate complexity during peak hours; or

(4) hybrid models, combining UTM tactical deconfliction with ATS oversight at interfaces with controlled airspace.

(b) The chosen concept should be consistent with the risk assessment and be explicitly described in the CONOPS and LOAs.

CAR-AAM.SB.405 UTM Services and USSP Designation

(a) The AUTHORITY, in coordination with the ANSP, will define the national UTM model, the airspace in which UTM services are required, the required service set and the arrangements for common information services.

(b) UTM services used in Sandbox operations shall be provided only by a USSP designated by the AUTHORITY.

(c) To be designated, a USSP shall demonstrate:

(1) an organisation, Safety Management System and security management system proportionate to its services;

(2) service performance, including availability, integrity, latency and continuity, meeting the requirements set by the AUTHORITY;

(3) cybersecurity meeting CAR-AAM.SB.460;

(4) interoperability with ANSP systems and with other USSPs;

(5) contingency and degraded-mode arrangements; and

(6) data recording and retention meeting CAR-AAM.SB.450.

(d) The UTM service set shall include, as applicable: network identification; geo-awareness; flight authorisation; traffic information; strategic and tactical conflict management; conformance monitoring; and weather information.

(e) The responsibilities of the Sandbox Operator, the USSP and the ANSP shall be defined in the ICD. The use of UTM services does not reduce the Sandbox Operator's responsibility for the safe conduct of its flights.

(f) Occurrences involving UTM services shall be reported in accordance with CAR-AAM.SB.215.

(g) Pending the designation of USSPs, the AUTHORITY may, for a defined period and in specified airspace, accept interim UTM arrangements provided by the ANSP or by another entity assessed by the AUTHORITY against paragraph (c) to the extent applicable. The interim arrangement, its limitations and its expiry shall be stated in each Sandbox Approval that relies on it.

(h) The designation criteria in paragraph (c) will be kept consistent with the requirements for the certification of USSPs under CAR-AAM, so that a designated USSP can be certified without repeating assessments already performed.

(i) UTM conflict management, including strategic and tactical deconfliction and conflict alerts, does not constitute an air traffic control service. In airspace where an air traffic control service is provided, separation remains the responsibility of ATC in accordance with CAR 172 and CAR 180. Any UTM-based arrangement intended to perform a separation function shall be approved by the AUTHORITY in the same manner as a change to ATS procedures.

(j) A UTM flight authorisation is complementary to, and does not replace, a flight plan or an ATC clearance where required under CAR 180.

AMC1 CAR-AAM.SB.405 – Minimum UTM / U-Space Service Set and Interfaces

(a) When defining the UTM / U-Space services to be used in AAM Sandbox operations, the Sandbox Operator should, as appropriate to the complexity level and risk profile, ensure that the service set covers at least:

(1) flight/mission plan submission, validation and authorisation within the approved operating volumes;

(2) strategic conflict detection and deconfliction against other known operations using the same or adjacent airspace;

(3) real-time or near-real-time tracking and status information for AAM aircraft and relevant constraints;

(4) dissemination of dynamic airspace information, including temporary restrictions, hazards and operational constraints; and

(5) interfaces with ATS units, where required, for coordination and exchange of relevant traffic and airspace information.

(b) The Operator should describe in the Concept of Operations and supporting documentation:

(1) which UTM / U-Space services are used for each phase of the operation;

(2) how these services support the mitigations identified in the risk assessment (including SORA, where applicable); and

(3) how the services are integrated with the Operations Control Centre (OCC) and other operational control functions required under CAR-AAM.SB.305.

(c) UTM / U-Space service providers supporting AAM Sandbox operations should be included in the Interface Control Document (ICD) referred to in AMC1 CAR-AAM.SB.400, covering:

(1) technical and operational interfaces between UTM / U-Space systems, the Operator’s systems and ATS systems;

(2) degraded modes and fail-safe behaviours (such as UTM outages, delayed data, loss of connectivity); and

(3) coordination for incident reporting, investigation and corrective actions in case of UTM-related events.

GM1 CAR-AAM.SB.405 – Reference to International Developments

(a) When defining UTM / U-Space functionality for AAM Sandbox projects, the AUTHORITY and stakeholders may, where appropriate and consistent with national law, take into account:

(1) ICAO UTM and U-Space concepts and guidance material;

(2) regional frameworks such as the EU U-Space package (for example Regulation (EU) 2021/664 and associated implementing rules) as a non-binding reference for service types, roles and interfaces; and

(3) ongoing international best practices, demonstration projects and lessons learned from other States or regions.

(b) Such reference material should be used as guidance, not as automatically applicable regulation, and should be adapted to the Omani environment, the Civil Aviation Law and the CAR framework.

GM2 CAR-AAM.SB.405 – ICAO UTM Framework Reference (Core Principles)

(a) When defining UTM / U-Space functionality and interfaces for AAM Sandbox projects, the AUTHORITY and stakeholders may, where appropriate and consistent with national law, take into account the ICAO document "Unmanned Aircraft Systems Traffic Management (UTM) – A Common Framework with Core Principles for Global Harmonization" (latest edition) and related ICAO UTM guidance.

(b) In particular, this reference material may be used to guide, as applicable to the Sandbox project complexity and airspace interaction:

(1) the definition of UTM–ATM boundaries and transitions, including airspace, service and system boundaries and how responsibility shifts at interfaces;

(2) the essential information exchanges between UTM stakeholders and ATS/ANSP, including the possible application of SWIM principles to support interoperability and trusted data sharing;

(3) the clarification of roles, responsibilities and accountability across the Sandbox Operator, UTM service provider(s), ANSP/ATS units and other relevant authorities, including how separation and deconfliction expectations are managed at interfaces;

(4) the management of contingencies and degraded modes, including service outages, surveillance or tracking degradation and abnormal situations requiring coordination with ATS; and

(5) service provider qualification considerations, including expectations for performance, resilience and secure operation, aligned with the cybersecurity and Digital Service Provider provisions in Subpart I.

(c) In developing UTM / U-Space support for AAM Sandbox operations, stakeholders are encouraged to map local UTM / U-Space services to the ICAO core capability areas, in order to support interoperability and safe integration with ATM, while ensuring that any use of such reference material remains adapted to the Omani context and CAR framework and does not create unintended legal obligations.

CAR-AAM.SB.410 Communications, Navigation, Surveillance, C2 Link and Spectrum

(a) CNS means shall be appropriate to the nature and risk of the operation, compatible with the airspace and with ATS and UTM procedures, and compliant with the requirements set by the AUTHORITY.

(b) The C2 Link shall meet the availability, integrity, continuity and latency requirements specified in the Sandbox Approval, taking into account ICAO Annex 10, Volume VI, as applicable. Where a C2 CSP is used, the Sandbox Operator shall have a service agreement defining those performance levels, performance monitoring, incident notification and change management.

(c) C2 Links and other radio equipment shall use spectrum authorised by the Telecommunications Regulatory Authority. Aviation-protected spectrum shall be used where the AUTHORITY so requires for the Complexity Level.

(d) Navigation shall provide accuracy, integrity, availability and continuity adequate for the intended routes and procedures, and shall be resilient to GNSS interference through detection, alerting and an alternative means of navigation or a safe fallback.

(e) Surveillance shall enable identification and tracking by the ANSP and USSPs, using the means specified by the AUTHORITY in coordination with the ANSP, including a transponder or, where supported by the ANSP surveillance system, ADS-B Out.

(f) Electronic conspicuity and, for BVLOS operations in non-segregated airspace, a detect-and-avoid capability accepted by the AUTHORITY shall be provided where required by the risk assessment.

(g) The Sandbox Operator shall include CNS solutions and interfaces in its risk assessment, Safety Management System and procedures.

AMC1 CAR-AAM.SB.410 – CNS Requirements by Operation Type

(a) The AUTHORITY should define or endorse CNS performance expectations for typical AAM Sandbox operation categories, such as:

(1) low-level, non-urban BVLOS cargo operations;

(2) urban parcel delivery corridors;

(3) passenger-carrying eVTOL routes linked to aerodromes/vertiports.

(b) For each category, guidance may be provided on:

(1) minimum C2 link performance (availability, latency, redundancy);

(2) navigation performance (e.g. RNP-like expectations or equivalent); and

(3) surveillance expectations (e.g. remote ID only vs transponder/ADS-B requirements).

(c) Where CNS solutions rely on third-party networks (e.g. public mobile networks), the Operator should assess the associated risks (coverage, resilience, cyber security) and propose mitigations acceptable to the AUTHORITY.

(d) C2 Link performance should be validated by flight test across the full Operational Volume, including at minimum altitude and in areas of urban signal shadowing.

GM1 CAR-AAM.SB.410 – Examples and Interfaces

(a) Example CNS configurations may include:

(1) C2 links over licensed spectrum with redundant paths or fallback to satellite or alternative technologies;

(2) GNSS-based navigation with additional geo-fencing and local augmentation for critical phases (e.g. approach to vertiport);

(3) surveillance via remote ID for low-risk areas, complemented by transponder/ADS-B in more integrated airspace segments.

(b) Interfaces between AAM CNS systems and ATS/UTM systems should be validated during pre-operational testing, with particular attention to:

(1) data accuracy, integrity and latency;

(2) failure modes and degraded performance; and

(3) cyber security and protection of critical data flows.

CAR-AAM.SB.415 Aeronautical Information

(a) Airspace structures, routes, corridors, restrictions and vertiports relevant to Sandbox operations that other airspace users need to know shall be published through the Aeronautical Information Service in accordance with CAR 175 and its AMC, by AIP amendment, AIP Supplement or NOTAM as appropriate.

(b) The Sandbox Operator and the vertiport operator shall provide accurate and timely data for publication, ensure consistency between published information and actual operations, and report any change affecting published information without delay.

(c) Geo-zones relevant to Sandbox operations shall be made available in digital form to USSPs and operators, in accordance with the arrangements agreed with the aeronautical information service provider.

(d) The AUTHORITY may limit publication for fully segregated operations where safety and transparency are not affected. Any airspace reservation or restriction shall nevertheless be notified by NOTAM.

AMC1 CAR-AAM.SB.415 – Information to Be Published

(a) As applicable, the following may be published via AIP, AIP SUP, AIP amendment or NOTAM:

(1) location and basic characteristics of vertiports or designated landing sites used by the Sandbox, where relevant to other airspace users;

(2) defined AAM routes, corridors or volumes in controlled or otherwise used airspace;

(3) specific operating hours or restrictions related to Sandbox operations; and

(4) temporary segregated areas established for testing or initial phases.

(b) For complex or high-profile Sandbox projects, a dedicated AIP section or briefing packages may be considered.

GM1 CAR-AAM.SB.415 – Practical Coordination

(a) In practice, the Sandbox Operator should establish a liaison point with the ANSP/AIS to:

(1) coordinate timelines for introducing or modifying published information;

(2) review draft publications for accuracy; and

(3) support the development of pre-flight information bulletins or briefings targeting users likely to be affected.

(b) Clear aeronautical information supports safe coexistence of Sandbox operations with other traffic and increases transparency for the aviation community.

CAR-AAM.SB.420 Meteorological Information

(a) The Sandbox Operator shall use meteorological information provided by DGMET, or by another provider accepted by the AUTHORITY, in accordance with CAR 174.

(b) For Complexity Level L2 and L3 projects, the Sandbox Operator shall ensure that information on local wind, gusts, turbulence, temperature, visibility and dust or sand conditions is available at vertiports and along routes, from on-site sensors or from services accepted by the AUTHORITY.

(c) Vertiport weather sensors shall be calibrated and maintained, and their data recorded. Vertiport and other local weather sensors meeting this paragraph may be used for operational decisions, and their data shall, where required, be shared with the meteorological service provider.

(d) For Complexity Level L2 and L3 projects, the Sandbox Operator shall conclude an arrangement with the meteorological service provider defining data exchange and validation, fallback arrangements and notification procedures.

GM1 CAR-AAM.SB.420 – Urban Micro-Weather

Wind effects around tall buildings and thermal effects over hot surfaces can exceed aircraft limitations even where area forecasts do not indicate hazardous conditions.

CAR-AAM.SB.425 Alerting and Search and Rescue

(a) The Sandbox Operator shall establish procedures to alert the relevant ATS unit or rescue coordination centre without delay when an AAM Aircraft with persons on board is overdue, missing or in distress, in accordance with CAR 172 and the applicable national search and rescue provisions.

(b) AAM Aircraft carrying persons shall be equipped with an emergency locator transmitter, or an alternative accepted by the AUTHORITY.

(c) For unmanned AAM Aircraft, the Sandbox Operator shall be able to provide the last known position and flight data to the emergency services immediately after the loss of an aircraft.

(d) The alerting service provided by ATS units under CAR 172 is not affected by this Regulation. The Sandbox Operator shall establish notification procedures for UTM failures and other abnormal conditions affecting safety or coordination, include them in the LOA with the ANSP and test them in tabletop or live exercises before the relevant phase.

SUBPART I – DATA, DIGITAL SERVICES AND CYBERSECURITY

CAR-AAM.SB.450 Data Recording, Retention and Access

(a) For each flight, the Sandbox Operator shall record:

(1) flight identification data, including date, times, aircraft, pilot or remote pilot, route or volume, phase and purpose;

(2) trajectory and performance data at a resolution appropriate to the Complexity Level;

(3) C2 Link, CNS and GNSS integrity parameters;

(4) energy state and critical system status;

(5) automated decisions recorded under CAR-AAM.SB.280(e);

(6) ATS and USSP messages and OCC decisions; and

(7) occurrences, deviations and activations of contingency or emergency procedures.

(b) AAM Aircraft carrying passengers shall be equipped with a crash-protected flight recorder, or an alternative accepted by the AUTHORITY.

(c) The Sandbox Operator shall retain:

(1) all flight data for at least 90 days;

(2) data relating to an occurrence until the related investigation is closed, and for at least 5 years; and

(3) performance and aggregated data for at least 24 months after the end of the Sandbox Project.

(d) Data shall be protected against unauthorised access, alteration and deletion, and shall be preserved in accordance with CAR-AAM.SB.215(f) following an accident or serious incident.

(e) The Sandbox Operator shall provide data to the AUTHORITY on request within 5 working days, or within 24 hours in connection with an occurrence, in a usable format. For Complexity Level L3 projects, the AUTHORITY may require near-real-time read-only access to operational data.

AMC1 CAR-AAM.SB.450 – Data Recording Proportionality

(a) The amount and granularity of recorded data should be proportionate to:

(1) the complexity and risk of the operation;

(2) the phase of the Sandbox project (pilot vs expansion vs pre-transition); and

(3) the learning objectives defined in the Sandbox Approval.

(b) For low-complexity, non-urban operations, the AUTHORITY may accept simpler data sets, provided they support basic safety monitoring and occurrence investigation.

(c) For urban or passenger-carrying AAM operations, more detailed flight, system and CNS data should be recorded, enabling reconstruction of events and more advanced analysis.

GM1 CAR-AAM.SB.450 – Data Types and Usage

(a) Examples of data types that may be recorded include:

(1) aircraft state (position, altitude, speed, attitude);

(2) system status indicators (e.g. battery state of charge, critical system faults);

(3) C2 and CNS performance data (e.g. link interruptions, GNSS warnings);

(4) UTM/ANS messages (clearances, authorizations, advisories);

(5) OCC decision logs (mission release, recalls, restrictions applied).

(b) Such data may be used to:

(1) investigate occurrences and near-misses;

(2) validate and refine the risk assessment and mitigations;

(3) derive safety, security and performance indicators; and

(4) support the final Sandbox close-out report and future rulemaking.

CAR-AAM.SB.455 Digital Service Providers

(a) The Sandbox Operator shall identify each DSP on which it relies, the service provided and its criticality (safety-critical, mission-critical or support), and shall include the associated risks in its integrated risk assessment.

(b) For safety-critical and mission-critical services, the Sandbox Operator shall have written agreements defining the service scope and performance, data quality and integrity, security obligations, incident notification within 24 hours, change management, and rights of audit for the Sandbox Operator and the AUTHORITY.

(c) A DSP providing a safety-critical service shall be identified in the Sandbox Approval and is subject to this Regulation in accordance with CAR-AAM.SB.010(a)(6).

(d) Cross-border data transfers and services hosted outside the Sultanate of Oman shall comply with national law, including the PDPL and national cybersecurity requirements, and shall not impair the AUTHORITY's access under CAR-AAM.SB.450(e).

(e) The Sandbox Operator remains responsible for compliance with this Regulation when using DSP services.

AMC1 CAR-AAM.SB.455 – Assessment and Oversight of DSPs

(a) The Sandbox Operator should implement a DSP assessment framework that considers, in particular:

(1) criticality of the service to safety, security or operational continuity;

(2) technical maturity and reliability of the DSP's solutions;

(3) security posture of the DSP (e.g. cyber controls, certifications);

(4) resilience and redundancy (e.g. backup data centers, failover strategies); and

(5) DSP incident response and communication capabilities.

(b) For highly critical services (e.g. UTM tactical deconfliction, C2 network management), the Sandbox Operator should conduct periodic reviews, audits or technical evaluations of DSP performance and security, in coordination with the AUTHORITY where relevant.

GM1 CAR-AAM.SB.455 – Examples of DSPs and Risks

(a) Examples of DSPs in AAM Sandbox context may include:

(1) UTM platform provider;

(2) network-based remote ID provider;

(3) cloud-based mission planning and analytics platform;

(4) high-resolution terrain/obstacle data provider;

(5) API-based weather and micro-weather services.

(b) Typical risks to consider:

(1) service outages or degradation affecting safety margins;

(2) data errors or latency leading to wrong operational decisions;

(3) cyber compromise of DSP environment affecting data integrity or availability;

(4) lack of clarity on data ownership and access rights.

CAR-AAM.SB.460 Cybersecurity

(a) The Sandbox Operator shall implement an information security management system proportionate to the Complexity Level, covering: aircraft systems and software; remote pilot stations and OCC systems; C2 Links and critical data flows; USSP and DSP interfaces; and vertiport and charging systems whose compromise could affect safety.

(b) The information security management system shall include:

(1) an asset inventory and data-flow mapping;

(2) a cyber risk assessment integrated with CAR-AAM.SB.200, including supply-chain risks;

(3) security controls, including access management, multi-factor authentication for critical systems, network segmentation, encryption and cryptographic key management;

(4) vulnerability and patch management with defined remediation times;

(5) security logging and monitoring;

(6) an incident response plan, exercised at least every 12 months;

(7) governance of software and firmware updates; and

(8) personnel training and awareness.

(c) The Sandbox Operator shall report any cyber incident that affects, or could affect, a safety-critical function to the AUTHORITY and to the national cybersecurity authority within 24 hours.

(d) No phase or EIS shall be authorised while a critical vulnerability affecting a safety-critical function remains unresolved, unless compensating measures have been accepted by the AUTHORITY.

(e) Contracts with USSPs, C2 CSPs, DSPs and other third parties shall include equivalent cybersecurity obligations.

(f) The Sandbox Operator shall maintain a cybersecurity evidence pack and provide it to the AUTHORITY with each application, Phase Gate package and EIS Readiness Dossier.

(g) The information security management system and the cyber risk assessment shall comply with the applicable national cybersecurity requirements and with the cybersecurity provisions of the NCASP, taking into account the guidance material issued by the AUTHORITY and by the national cybersecurity authority.

AMC1 CAR-AAM.SB.460 – Cyber Risk Management

(a) The Sandbox Operator should implement a structured cyber risk management approach, taking into account recognised information security and cyber risk frameworks (for example, principles consistent with ISO/IEC 27005 or equivalent), adapted to the aviation and AAM operational context and integrated with the Operator's overall risk management and SMS processes.

(b) As a minimum, the Operator's approach should:

(1) classify systems, services and data by criticality (for example, safety-critical, mission-critical and support);

(2) identify potential cyber-attack vectors, including but not limited to remote access, supply chain dependencies and insider threats;

(3) apply defence-in-depth principles, ensuring multiple, complementary layers of protection for critical systems and data; and

(4) include periodic vulnerability assessments and, where proportionate to the risk, penetration testing of critical systems and interfaces.

(c) The Operator should maintain an incident register of cyber events and near-misses and integrate this register into its occurrence reporting and safety management processes, including the reporting obligations established under CAR-AAM.SB.215 and the applicable CAR provisions on incident and accident reporting.

(d) Cybersecurity Evidence Pack. The Sandbox Operator and, where applicable, critical Digital Service Providers and other critical service providers should maintain, and provide to the AUTHORITY upon request, an evidence pack which should normally include, as a minimum:

(1) an asset inventory and high-level data-flow mapping for safety- and security-critical systems and services (including vehicle, ground control station, C2 links, UTM and other DSP systems);

(2) a cyber risk assessment linked to operational hazards and threats, including supply-chain risks and dependencies on third-party services;

(3) a secure configuration baseline for critical systems, including hardening measures, access control, multi-factor authentication (where appropriate), cryptographic key management and encryption practices;

(4) a vulnerability and patch management process with defined timelines and priorities for remediation of critical vulnerabilities;

(5) a security logging and monitoring approach, including defined retention periods sufficient to support incident detection, investigation and reconstruction;

(6) an incident response plan, including roles, responsibilities, internal and external coordination contacts (for example CAA, ANSP/ATS units, UTM providers and critical DSPs) and evidence of exercises or tests performed;

(7) third-party assurance evidence for critical providers (for example, audit reports, attestation statements, technical test results or penetration testing reports, where proportionate); and

(8) software and firmware update governance arrangements, including release approval processes, verification of integrity, roll-out and rollback procedures for updates that affect safety- or security-critical systems.

GM1 CAR-AAM.SB.460 – Practical Cyber Measures

(a) Typical practical measures may include:

(1) strong authentication and access control to OCC, UTM and mission systems;

(2) segregation of operational networks from office IT networks;

(3) encryption of C2 and critical data links, where technically feasible;

(4) secure software update processes with integrity checks;

(5) logging and monitoring of access to critical systems;

(6) regular backup and tested recovery procedures for key systems and data.

(b) Cybersecurity training and awareness should target not only IT specialists but also:

(1) remote pilots and OCC staff;

(2) engineers and maintenance personnel; and

(3) managers and decision-makers who approve operational changes.

(c) Relevant references include Commission Implementing Regulation (EU) 2023/203 (Part-IS) on organisational information security in aviation, EUROCAE ED-201A (aeronautical information system security framework) and EUROCAE ED-205A (security of ATM/ANS ground systems).

CAR-AAM.SB.465 Personal Data, Confidentiality and Use of Information

(a) The Sandbox Operator shall process personal data in accordance with the PDPL and its implementing regulations.

(b) The Sandbox Operator shall limit access to operational and personal data to authorised persons with a need to know, protect such data by appropriate technical and organisational measures, and document rules for retention and deletion consistent with CAR-AAM.SB.450(c) and applicable law.

(c) Imagery and sensor data captured incidentally during flights shall not be used for any purpose other than the safety and conduct of the flight, unless that purpose is authorised in the Sandbox Approval and complies with applicable law.

(d) Data collected under this Regulation may be used for safety, security and operational monitoring; investigation of occurrences; performance evaluation and lessons learned; and, in de-identified or aggregated form, regulatory and policy development.

(e) Where the Sandbox Project involves passengers or customers, the Sandbox Operator shall inform them clearly of the experimental nature of the service, the data collected and its intended use, and their rights under applicable law.

(f) Commercially sensitive information provided to the AUTHORITY will be protected in accordance with CAR-AAM.SB.140(c).

AMC1 CAR-AAM.SB.465 – Transparency and Aggregation

(a) The Sandbox Operator should, where possible, use aggregated or anonymized data for reporting and analysis, especially when sharing results publicly or with third parties.

(b) Information materials for passengers, customers or communities should:

(1) explain, in clear language, that the service is part of an AAM Sandbox;

(2) outline key safeguards in place for safety, security and privacy; and

(3) provide contact channels for questions or complaints.

GM1 CAR-AAM.SB.465 – Balancing Safety Learning and Privacy

(a) The AAM Sandbox is designed to generate rich operational data for safety and regulatory learning. At the same time, personal data and confidential commercial information must be protected.

(b) Practical ways to balance these objectives include:

(1) role-based access control to detailed operational data;

(2) anonymization of personal identifiers in safety analysis and dashboards;

(3) clear separation between datasets used for internal safety purposes and those used for external communication.

SUBPART J – ENVIRONMENTAL AND COMMUNITY PROTECTION

CAR-AAM.SB.500 Environmental Assessment

(a) The Sandbox Operator shall identify, assess and manage the environmental effects of its Sandbox operations in accordance with national environmental legislation and any permit required by the competent environmental authority.

(b) The environmental assessment shall address, as relevant:

(1) aircraft noise and ground noise;

(2) energy use and life-cycle emissions, including local air quality;

(3) visual impact and lighting;

(4) effects on wildlife, protected areas and sensitive ecosystems, including coastal bird and turtle nesting areas; and

(5) battery storage, recycling and disposal.

(c) The environmental assessment shall be consistent with the CONOPS and risk assessment, identify significant effects, propose mitigations and monitoring measures, and state any conditions to be reflected in the Sandbox Approval.

(d) The Sandbox Operator shall implement the agreed mitigations, monitor environmental performance, and cooperate in any environmental review or permitting process.

(e) Used or damaged batteries shall be handled, stored, transported and disposed of in accordance with national rules on hazardous waste.

AMC1 CAR-AAM.SB.500 – Proportional Environmental Screening

(a) The depth and formality of the environmental assessment should be proportionate to:

(1) the scale and duration of the Sandbox project;

(2) the location and sensitivity of the environment (e.g. dense urban areas, coastal zones, protected sites); and

(3) the type of operations (e.g. cargo vs passenger, day-only vs day/night).

(b) For small-scale, non-urban projects with limited footprint, a structured environmental screening may be sufficient, supported by basic data and local constraints.

(c) For larger or urban projects, or those near sensitive areas, more detailed studies may be required, such as:

(1) noise mapping or modelling;

(2) assessment of routes and vertiport locations against environmental constraints;

(3) evaluation of lighting and visual impact.

GM1 CAR-AAM.SB.500 – Reference to International Guidance

(a) When assessing environmental aspects, the AUTHORITY and Sandbox Operator may consider, as non- binding reference:

(1) ICAO Annex 16 (Environmental Protection) and relevant guidance material;

(2) any applicable national environmental regulations and guidelines;

(3) emerging international practices for AAM and UAS environmental assessment.

(b) The aim in the Sandbox context is to:

(1) identify early any significant environmental constraints;

(2) test environmental mitigations and operating concepts; and

(3) generate data to support future policy and regulatory decisions.

CAR-AAM.SB.505 Noise

(a) Each AAM Aircraft shall have noise data acceptable to the AUTHORITY, derived from noise certification under ICAO Annex 16, Volume I, where an applicable standard exists, or otherwise from measurements made using a procedure accepted by the AUTHORITY.

(b) The Sandbox Operator shall identify and manage noise effects, in particular in or near populated and noise-sensitive areas, through measures derived from the environmental assessment and reflected in the CONOPS, the vertiport documentation and the Sandbox Approval.

(c) Where required by the AUTHORITY, the Sandbox Operator shall apply noise-related operating restrictions, such as time-of-day limits, routing and altitude constraints and limits on the number of movements, and shall monitor compliance with them.

(d) For Complexity Level L2 and L3 projects with operations over populated areas, the Sandbox Operator shall conduct noise monitoring at locations agreed with the AUTHORITY and report the results in accordance with CAR-AAM.SB.605.

(e) The Sandbox Operator shall receive, record, investigate and respond to noise complaints, and shall report complaint trends in accordance with CAR-AAM.SB.605.

AMC1 CAR-AAM.SB.505 – Noise Mitigation Options

(a) Noise mitigation options may include:

(1) selection of routes and corridors that avoid or minimize overflight of sensitive areas;

(2) definition of vertical profiles to maximize height over noise-sensitive receptors where feasible;

(3) limiting operations during night-time or other particularly sensitive periods;

(4) limiting the number or frequency of movements in specific locations or time windows;

(5) operational techniques (e.g. climb/approach profiles) consistent with safety and aircraft performance.

(b) The Sandbox Operator should periodically review noise mitigation effectiveness, using available monitoring data and feedback from communities and authorities.

GM1 CAR-AAM.SB.505 – Complaint Handling

(a) A simple noise complaint management process may include:

(1) a contact point (phone or online) for the public to submit complaints;

(2) a log of complaints with time, location and nature of the issue;

(3) investigation of complaints to determine whether they relate to AAM operations and whether any deviations or issues occurred;

(4) feedback to the complainant where appropriate; and

(5) trend analysis to identify locations, times or operational patterns requiring additional mitigations.

(b) Lessons from complaint patterns and associated operational data should be fed back into route design, operating hours and community engagement under CAR-AAM.SB.510.

(c) Relevant reference: EASA environmental protection technical specifications for the noise measurement of VTOL-capable aircraft.

CAR-AAM.SB.510 Public and Community Engagement

(a) For Sandbox Projects that may affect local communities or public spaces, the Sandbox Operator shall implement an engagement plan, agreed with the AUTHORITY and proportionate to the scale, location and nature of the project.

(b) The engagement plan shall:

(1) inform the public, before operations begin, of the purpose, duration, operating areas and hours of the project;

(2) explain the safety, security, privacy and environmental safeguards in place;

(3) provide accessible channels for questions, feedback and complaints in Arabic and English; and

(4) define indicators of engagement effectiveness and public acceptance.

(c) Where requested by the AUTHORITY or local authorities, the Sandbox Operator shall participate in engagement activities and provide non-confidential information about the project and its effects.

(d) The Sandbox Operator shall take account of issues raised by communities and local authorities when reviewing its CONOPS, mitigations and operating restrictions, and shall inform the AUTHORITY of any significant concerns.

AMC1 CAR-AAM.SB.510 – Engagement Planning

(a) The Sandbox Operator should develop a community engagement plan that:

(1) identifies the communities and stakeholders potentially affected by AAM operations (e.g. residents near vertiports and routes, local businesses, schools, hospitals);

(2) describes the information to be provided and the communication channels (e.g. website, leaflets, social media, public meetings);

(3) defines how feedback and concerns will be collected, logged and considered; and

(4) sets basic indicators for engagement effectiveness (e.g. number of interactions, types of issues raised).

(b) For projects with limited scope and minimal community impact (e.g. non-urban cargo operations), engagement activities may be correspondingly simpler, focusing on local stakeholders directly affected.

GM1 CAR-AAM.SB.510 – Examples of Engagement Measures

(a) Practical examples of engagement measures may include:

(1) a dedicated page or section on the Operator's or Sandbox project website, providing maps, operating hours and FAQs;

(2) information sessions with local councils, municipalities or relevant community groups before the start of operations;

(3) targeted briefings for sensitive stakeholders (e.g. schools, hospitals, large employers) located under or near AAM routes;

(4) periodic updates on project progress, key safety/environmental indicators and lessons learned.

(b) Engagement does not mean that all concerns can be fully eliminated; however, transparent dialogue and responsiveness to legitimate issues can significantly improve public acceptance and support the long-term integration of AAM into the national aviation system.

SUBPART K – ECONOMIC, INSURANCE AND CONSUMER PROTECTION

CAR-AAM.SB.550 Economic and Innovation Considerations

(a) The AUTHORITY will consider the economic and innovation value of a Sandbox Project under CAR-AAM.SB.160(a)(6), consistent with Oman Vision 2040 and NAS 2040, only once the safety, security and environmental criteria are satisfied.

(b) The applicant shall demonstrate, as applicable, that the proposed Sandbox Project:

(1) is financially and operationally feasible for its duration, including its wind-down;

(2) contributes to innovation in AAM technologies, operations or services;

(3) offers value to the Sultanate of Oman in terms of connectivity, services, efficiency or public benefit; and

(4) contributes to national capability through skills development, technology transfer or local partnerships.

(c) Economic and innovation considerations shall not justify the acceptance of a higher safety, security or environmental risk.

AMC1 CAR-AAM.SB.550 – Assessment of Economic and Innovation Aspects

(a) When assessing economic and innovation aspects, the AUTHORITY should consider:

(1) the clarity and realism of the proposed concept and value proposition;

(2) the degree of technical, operational or service innovation compared to existing solutions;

(3) the potential scalability or replicability of the concept beyond the Sandbox; and

(4) the extent to which the project supports national objectives in aviation, logistics and mobility.

(b) The AUTHORITY may give priority to projects that:

(1) address clear needs (e.g. medical, logistics, connectivity);

(2) incorporate strong local partnerships or capacity-building elements; or

(3) generate data and lessons useful for wider regulatory and policy development.

GM1 CAR-AAM.SB.550 – Omanisation, SMEs and Local Value

(a) Without prejudice to safety and security, the AUTHORITY may, in cooperation with other competent bodies, encourage AAM Sandbox projects that:

(1) involve Omani SMEs as partners or suppliers;

(2) contribute to Omanisation of jobs and skills in relevant domains (operations, maintenance, data, software, regulation); and

(3) support local innovation ecosystems (universities, research centers, start-ups).

(b) Such elements may be reflected in the qualitative evaluation of Sandbox applications, but should be transparently communicated and applied in a consistent manner.

(c) Criteria relating to Omanisation, SMEs and local value should be published before a Sandbox Programme opens.

CAR-AAM.SB.555 Insurance and Liability

(a) The Sandbox Operator shall hold, before operations begin and throughout the Sandbox Project, insurance covering:

(1) third-party liability for death, bodily injury and damage to property;

(2) where passengers, baggage or cargo are carried, liability in respect of them in accordance with national law and any applicable international convention; and

(3) war and allied perils, where required by the AUTHORITY.

(b) The minimum cover shall be not less than the amounts set by the AUTHORITY for the Complexity Level and aircraft mass or, for aircraft with a maximum take-off mass above 500 kg, not less than the amounts required by national rules for comparable manned aircraft.

(c) The Sandbox Operator shall notify the AUTHORITY at least 30 days before any cancellation or reduction of cover. Operations shall cease if cover lapses.

(d) Liability arrangements with partners, contractors and customers shall be documented and shall not waive rights of passengers or third parties that cannot lawfully be waived.

AMC1 CAR-AAM.SB.555 – Insurance Adequacy

(a) In determining the adequacy of insurance, the Operator should consider:

(1) maximum foreseeable loss scenarios given the route structure, environment and type of operations;

(2) the presence of passengers or critical cargo;

(3) population density and nature of infrastructure in areas overflown; and

(4) potential cumulative exposure if multiple aircraft operate simultaneously.

(b) The AUTHORITY may issue guidance on minimum levels of third-party liability insurance for different categories of AAM Sandbox operations, taking into account international practice and national law.

GM1 CAR-AAM.SB.555 – Practical Arrangements

(a) The Sandbox Operator should ensure that:

(1) insurance is in place before operations begin;

(2) cover is maintained throughout the Sandbox project and reviewed if operations change; and

(3) operational staff are aware, at a basic level, of the scope of insurance and the importance of compliance with limitations and conditions (e.g. operational areas, aircraft types, payload).

(b) In case of significant operational changes (e.g. new routes, new aircraft, expanded operations), the Operator should confirm with its insurer that coverage remains adequate and aligned with the new risk profile.

CAR-AAM.SB.560 Consumer and User Protection

(a) Where Sandbox operations involve passengers or retail customers, the Sandbox Operator shall comply with national consumer protection legislation and with this rule.

(b) The Sandbox Operator shall:

(1) inform passengers and users, before purchase and before flight, that the service is conducted under a time-limited Sandbox Approval;

(2) explain the key limitations, conditions and risks of the service in plain Arabic and English;

(3) provide passengers with the safety information required by CAR-AAM.SB.330(e);

(4) publish channels for complaints and claims, and respond to complaints within 30 days;

(5) publish a refund policy for cancellations and major disruptions attributable to the Sandbox Operator; and

(6) ensure accessibility for persons with reduced mobility, subject to safety limitations.

(c) Terms and conditions shall be clear and transparent and shall not seek to waive rights that cannot lawfully be waived.

(d) Marketing and promotional material shall not mislead as to the maturity of the technology, the regulatory status of the service or the expected level of service, and shall not state or imply approval by the AUTHORITY beyond the terms of the Sandbox Approval.

(e) A passenger may decline to fly at any time before departure without penalty where the flight is conducted for demonstration purposes.

AMC1 CAR-AAM.SB.560 – Information to Passengers and Users

(a) Information to passengers and users should, as appropriate, include:

(1) the identity of the service provider and the fact that the service is part of an AAM Sandbox;

(2) basic description of the service (route, duration, main conditions);

(3) key safety and security measures that concern users (e.g. baggage restrictions, behaviour on board or at vertiports);

(4) high-level explanation of how personal data will be used, consistent with Subpart I;

(5) contact details for support, complaints and claims.

(b) For vulnerable users (e.g. persons with reduced mobility, minors), the Operator should pay particular attention to accessibility of information and any specific needs.

GM1 CAR-AAM.SB.560 – Example Consumer Protection Practices

(a) Practical measures for consumer protection in AAM Sandbox operations may include:

(1) a simple passenger information leaflet or digital equivalent explaining the Sandbox, safety basics and rights;

(2) clear signage and instructions at vertiports or boarding points;

(3) a straightforward refund or rebooking policy in case of cancellations or major disruptions attributable to the operator;

(4) visible channels for feedback (QR code, website, contact center).

(b) While the Sandbox context implies experimentation and possible adjustments, maintaining a minimum standard of consumer protection helps build trust and supports wider acceptance of AAM services in the long term.

SUBPART L – PERFORMANCE MONITORING, REPORTING AND LESSONS LEARNED

CAR-AAM.SB.600 Performance Indicators

(a) The Sandbox Operator shall establish a Performance Monitoring Plan with indicators covering safety; aviation security and cybersecurity; environmental and community effects; and operational and economic performance.

(b) The indicators shall be derived from the CONOPS, risk assessment and Safety Management System, be proportionate to the Complexity Level, and be agreed with the AUTHORITY.

(c) For each indicator, the Performance Monitoring Plan shall define the metric, the data source, the monitoring frequency, and the alert and target levels. Safety indicators shall include the safety performance indicators required by CAR-AAM.SB.210 and the measures linked to Stop Conditions.

(d) The Sandbox Operator shall monitor the indicators at a frequency commensurate with the operational tempo and shall act on adverse trends or exceedances.

(e) The AUTHORITY will use indicator data from all Sandbox Projects in the safety performance monitoring of the SSP.

AMC1 CAR-AAM.SB.600 – Core Indicator Set

(a) As a guideline, the Sandbox Operator should define a core set of indicators which may include, as applicable:

(1) Safety: number and rate of safety occurrences per flight or flight hour, by severity; technical failure rates affecting safety; C2 link loss events; airspace infringements; unstable or abnormal approaches;

(2) Security / Cyber: number of reported security/cyber incidents; attempted unauthorized access events; effectiveness of access controls and monitoring;

(3) Environment: number and nature of significant noise complaints; indicative noise exposure at selected locations where monitoring exists; any recorded environmental incidents;

(4) Operational / Economic: on-time performance for missions; completion/cancellation rates and main causes; utilization of aircraft and vertiports; indicative cost or efficiency metrics where available.

(b) For each indicator, the Operator should:

(1) define a clear metric and calculation method;

(2) identify data sources and collection responsibilities; and

(3) define review intervals (e.g. weekly, monthly, per phase).

(c) The core set should also include, as applicable: GNSS interference rate; battery thermal events; conformance alerts; complaints per 1,000 movements; and public acceptance survey results.

GM1 CAR-AAM.SB.600 – Dashboards and Internal Use

(a) In practice, indicators can be displayed in dashboards used by management, OCC and SMS functions to:

(1) detect negative trends early;

(2) check the effect of new mitigations or operating restrictions;

(3) support decisions on phase progression within the Sandbox (e.g. expansion of routes, increased frequency).

(b) The same data set can be used, in aggregated form, to support the Sandbox close-out report and to inform the AUTHORITY's strategic assessments and future regulatory development.

CAR-AAM.SB.605 Periodic Reporting

(a) The Sandbox Operator shall submit periodic reports to the AUTHORITY at least monthly during Phase 1 and during the initial EIS period, and at least quarterly otherwise, unless the Sandbox Approval specifies a different frequency.

(b) Periodic reports shall be submitted within 15 working days of the end of the reporting period and shall include:

(1) the operations conducted, including number of flights, flight hours, routes, aircraft and utilisation;

(2) significant safety, security, cybersecurity and environmental events and trends;

(3) performance against indicators, exceedances and the actions taken;

(4) changes implemented, by classification;

(5) the status of findings and corrective actions;

(6) deviations and exemptions used;

(7) significant community and customer feedback; and

(8) any other information requested by the AUTHORITY.

(c) The Sandbox Operator shall designate the person responsible for the quality control and submission of periodic reports.

(d) The AUTHORITY will hold a review meeting with the Sandbox Operator at least every 6 months.

AMC1 CAR-AAM.SB.605 – Format and Level of Detail

(a) The AUTHORITY may provide a standard reporting template for AAM Sandbox projects to support consistency and comparability of information.

(b) The level of detail in reports should be:

(1) sufficient to allow the AUTHORITY to understand operational progress, emerging risks and the effectiveness of mitigations;

(2) proportionate to the scale and risk of the project; and

(3) aligned with the specific learning objectives set for the Sandbox.

(c) For small or low-risk projects, concise dashboards and narrative summaries may be sufficient. For larger or more complex projects, more detailed analyses and breakdowns may be expected.

GM1 CAR-AAM.SB.605 – Use of Periodic Reports

(a) Periodic reports enable the AUTHORITY to:

(1) monitor that operations remain within approved envelopes;

(2) identify any need for additional conditions, limitations or oversight;

(3) detect systemic issues early (e.g. recurring technical problems, airspace conflicts, community concerns);

(4) progressively build an evidence base for future regulatory and policy decisions.

(b) Periodic reporting also supports structured dialogue between the Sandbox Operator and AUTHORITY through regular review meetings, where trends, risks and potential adjustments can be discussed.

CAR-AAM.SB.610 Close-Out Report

(a) The Sandbox Operator shall submit a draft Close-Out Report within 90 days after the end of operations, whether at expiry, surrender, revocation or early termination, and a final Close-Out Report within 30 days after receiving the AUTHORITY's comments.

(b) The Close-Out Report shall include:

(1) the project scope, phases and timelines, and deviations from the initial plan;

(2) a summary of the operations conducted;

(3) a consolidated view of safety, security, environmental and operational performance, including key indicators, significant events and trends;

(4) the technical and operational issues encountered and how they were resolved;

(5) an assessment of the effectiveness of mitigations, operating restrictions and CNS and UTM arrangements;

(6) the outcomes of interaction with communities, customers and other stakeholders;

(7) conclusions on economic and innovation aspects, including feasibility, scalability and added value;

(8) lessons learned and recommendations for the Sandbox Operator's future operations, for future AAM projects and for regulation, policy, procedures and infrastructure; and

(9) where the project was terminated early, the reasons and the related lessons.

(c) The Close-Out Report shall include the Sandbox Conversion Annex required by CAR-AAM.SB.655.

(d) The Sandbox Operator shall cooperate with the AUTHORITY in any additional analysis or debriefing.

(e) The AUTHORITY may publish de-identified lessons learned in accordance with CAR-AAM.SB.220(e).

AMC1 CAR-AAM.SB.610 – Structure and Timing of Close-Out Report

(a) The AUTHORITY may provide a recommended structure or template for the Close-Out Report to support comparability across different Sandbox projects.

(b) Unless otherwise agreed, the Sandbox Operator should:

(1) submit a draft Close-Out Report within a timeframe agreed in the Sandbox Approval (e.g. within three months after the end of operations); and

(2) finalize the report after discussion with the AUTHORITY, incorporating any clarifications or additional analysis requested.

(c) Where appropriate, the Close-Out Report may include annexes or references to:

(1) selected data sets and analyses (e.g. indicator trends, route usage, noise complaints statistics);

(2) key risk assessments or updates;

(3) summaries of stakeholder engagement activities.

GM1 CAR-AAM.SB.610 – Use of Lessons Learned

(a) Lessons learned from AAM Sandbox projects are expected to feed into:

(1) refinement of the AAM regulatory framework (including CAR-AAM.SB and other related CARs);

(2) updates to national strategies and plans for AAM and advanced mobility;

(3) guidance material and best-practice documents for future operators, infrastructure developers and service providers;

(4) capacity-building for CAA staff and national stakeholders.

(b) Where feasible and consistent with confidentiality and data protection requirements, the AUTHORITY may decide to share selected results and lessons (e.g. aggregated data, anonymised case studies) with the wider aviation community and public, to:

(1) foster transparency;

(2) support broader understanding of AAM risks, mitigations and benefits;

(3) accelerate safe and orderly integration of AAM into the aviation system.

(c) The Sandbox Operator may benefit from the Close-Out process by:

(1) clarifying what conditions are required to move towards more permanent approvals;

(2) identifying design, operational or business model improvements;

(3) leveraging the evidence generated in the Sandbox when engaging with investors, partners or customers, where appropriate.

CAR-AAM.SB.615 Wind-Down and Exit

(a) The Sandbox Operator shall maintain a wind-down plan, acceptable to the AUTHORITY, for the orderly cessation of operations at expiry, on surrender, on suspension exceeding 90 days, on revocation or on insolvency.

(b) The wind-down plan shall address:

(1) the safe recovery, storage or transfer of aircraft and batteries;

(2) the removal or making safe of temporary infrastructure and the restoration of sites;

(3) the withdrawal of published aeronautical information and geo-zones;

(4) the notification of customers, passengers, partners and communities;

(5) the handling of outstanding claims and refunds;

(6) the preservation of records and data and, where required, their transfer to the AUTHORITY; and

(7) the financial resources needed to implement the plan.

(c) For Complexity Level L2 and L3 projects, the AUTHORITY may require a financial guarantee sufficient to cover the wind-down plan.

(d) The Sandbox Operator shall notify the AUTHORITY at least 60 days before a planned cessation of operations, or immediately in any other case, and shall implement the wind-down plan within the period set by the AUTHORITY.

(e) Where a Sandbox Project is to continue under a permanent regulatory framework, the AUTHORITY may approve transitional continuation under CAR-AAM.SB.665(e) in place of wind-down.

SUBPART M – DEVIATIONS, TRANSITION, REVIEW AND FINAL PROVISIONS

CAR-AAM.SB.650 Transitional Arrangements for Existing Operations

(a) Within 90 days of the applicability date of this Regulation, the AUTHORITY will identify existing AAM-related or RPAS trials, approvals and operations that fall within the scope of this Regulation.

(b) Where such operations were authorised under other CARs, including CAR 102, CAR 139, CAR 171 to CAR 179, CAR 180 or specific decisions of the AUTHORITY, the AUTHORITY will decide in writing to:

(1) allow the operation to continue under its existing approval, subject to any additional conditions, until a stated date not later than 12 months after the applicability date;

(2) require the operator to apply for a Sandbox Approval within a stated period; or

(3) require the operation to cease, or to be modified, where it cannot be accommodated safely within the AAM Sandbox or another regulatory framework.

(c) Any decision under paragraph (b) will take into account the risk profile of the operation, the maturity of the operator's organisation and Safety Management System, and the value of bringing the operation into the AAM Sandbox for learning and regulatory development.

(d) An operation brought under this Regulation shall align its CONOPS, risk assessment, Safety Management System and procedures with this Regulation and meet the transitional milestones specified in its Sandbox Approval.

AMC1 CAR-AAM.SB.650 – Mapping of Pre-Existing Approvals

(a) The AUTHORITY should conduct a mapping exercise to determine:

(1) which existing experimental, demonstration or special approvals are clearly within the intended scope of the AAM Sandbox;

(2) which operations are better regulated solely under other CARs (e.g. conventional RPAS under CAR 102); and

(3) which operations may need to be discontinued or revised due to unacceptable risks or misalignment with national policy.

(b) The AUTHORITY should communicate its decisions and expectations clearly to affected Operators, including any deadlines for transition to Sandbox Approvals or for ceasing operations.

GM1 CAR-AAM.SB.650 – Practical Transition Scenarios

(a) Practical examples may include:

(1) a small cargo RPAS trial under CAR 102 that is migrated into the AAM Sandbox to test new UTM integration concepts;

(2) an existing heliport that is to be adapted as a mixed-use vertiport for eVTOL demonstration flights under the Sandbox;

(3) an experimental urban drone service that is required either to regularize under Sandbox conditions or to cease if risks cannot be mitigated.

(b) Transparency of transitional decisions supports fairness for Operators and clarity for other stakeholders.

CAR-AAM.SB.655 Conversion to Permanent Regulation

(a) As part of its Close-Out Report, the Sandbox Operator shall submit a Sandbox Conversion Annex identifying:

(1) the validated operating envelope and ODD, and the limitations proven necessary;

(2) the safety, security, cybersecurity, ANS, UTM and infrastructure controls demonstrated to be effective, and those that should be non-negotiable for scaling;

(3) the requirements proposed for permanent regulation, in draft rule text;

(4) the recommended oversight concept, indicators and triggers; and

(5) any gaps requiring further trials or research.

(b) The AUTHORITY will use the Sandbox Conversion Annexes and the accumulated evidence to decide whether to amend existing CARs, issue dedicated AAM regulations or establish a certification or authorisation pathway for operations beyond the AAM Sandbox, in accordance with CAR 11.

(c) The Sandbox Operator shall submit an interim Sandbox Conversion Annex, covering the items of paragraph (a) to the extent known, with each Phase Gate package, so that evidence is available for the drafting of CAR-AAM before the end of the Sandbox Project.

AMC1 CAR-AAM.SB.655 – Minimum Content of Sandbox Conversion Annex

(a) The Sandbox Conversion Annex should, at minimum:

(1) summarize evidence (tests, occurrences, KPI trends, audits, drills);

(2) identify “non-negotiable controls” for scaling (e.g. UTM performance assumptions, cyber controls, vertiport emergency readiness);

(3) propose permanent requirements using “shall/should” language aligned with CAR drafting practice; and

(4) identify gaps requiring further trials or research.

GM1 CAR-AAM.SB.655 – Purpose

The Sandbox Conversion Annex ensures the Sandbox is a controlled learning pipeline to permanent, scalable and internationally credible AAM regulation.

CAR-AAM.SB.657 Transition to CAR-AAM

(a) Once the relevant Part of CAR-AAM applies, a Sandbox Operator may apply to convert its Sandbox Approval, Sandbox Flight Permit or other instrument issued under this Regulation into the corresponding instrument under CAR-AAM, in accordance with the transitional provisions of CAR-AAM.

(b) The AUTHORITY will base the conversion on the Applicability and Compliance Matrix, the Sandbox Conversion Annex and the record of the Sandbox Project, and will not require evidence already accepted under this Regulation to be produced again, unless the requirement of CAR-AAM differs.

(c) Until the conversion decision is taken, the Sandbox Approval remains valid within its conditions and, where necessary, under the transitional measures adopted under CAR-AAM.SB.665(e).

(d) The Target CAR-AAM Category recorded under CAR-AAM.SB.157(e) is indicative and does not prejudge the conversion decision.

AMC1 CAR-AAM.SB.657 – Correspondence of Instruments

(a) Instruments issued under this Regulation should be converted as follows:

Instrument under CAR-AAM.SB	Corresponding instrument under CAR-AAM
Sandbox Approval – unmanned, no certified-category trigger	Operational authorisation or light UAS operator certificate (CAR-AAM.SPEC, CAR-AAM.LUC)
Sandbox Approval – unmanned, certified-category trigger	Certified-category operator certificate (CAR-AAM.CERT)
Sandbox Approval – piloted VTOL-capable aircraft	VTOL operator approval (CAR-AAM.IAM)
Sandbox Flight Permit	Permit to fly, then type certificate or validated type certificate (CAR-AAM.AIR, CAR 21)
Sandbox Remote Pilot Authorisation	Remote pilot competence certificate or licence (CAR-AAM.PEL)
USSP designation	USSP certificate (CAR-AAM.ASP)
Vertiport or AAM Landing Site authorisation	Vertiport certificate or approval (CAR 139)

(b) The Part references above follow the proposed structure of CAR-AAM and will be confirmed when CAR-AAM is adopted.

CAR-AAM.SB.660 Mid-Term Review

(a) Not later than 12 months after the applicability date of this Regulation, the AUTHORITY will conduct a Mid-Term Review to:

(1) evaluate implementation experience and performance trends;

(2) assess the AUTHORITY's own performance, including processing times under CAR-AAM.SB.135 and completion of the Oversight Plan;

(3) identify any urgent amendments or clarifications required to maintain proportionality and enforceability;

(4) confirm whether the roadmap to permanent regulation remains achievable within the validity period;

(5) identify the evidence from Sandbox Projects to be used in drafting CAR-AAM, including the requirements for manned VTOL-capable aircraft operations and vertiports and any national deviations from the EASA-based baseline; and

(6) assess the readiness of current Sandbox Projects to convert under CAR-AAM.SB.657.

(b) Following the Mid-Term Review, the AUTHORITY may issue interim guidance or amendments in accordance with CAR-AAM.SB.675(d).

(c) The AUTHORITY will publish a summary of the conclusions of the Mid-Term Review.

AMC1 CAR-AAM.SB.660 – Mid-Term Review Scope

(a) The Mid-Term Review should consider at least:

(1) performance indicator trends and major occurrences (Subpart L);

(2) outcomes from the application/approval process (Subpart C);

(3) deviations/exemptions usage patterns and whether they indicate structural regulatory gaps (CAR-AAM.SB.670);

(4) ANS/UTM interface performance and degraded mode events (Subpart H);

(5) cyber/DSP events and closure of critical vulnerabilities (Subpart I); and

(6) community engagement outcomes and complaint trends (Subpart J).

GM1 CAR-AAM.SB.660 – Practical Effect

The Mid-Term Review avoids “end-of-period surprises” and forces early conversion of learning into action.

CAR-AAM.SB.665 Validity, Review and Extension of this Regulation

(a) This Regulation is issued as a time-limited framework for controlled experimentation, learning and the preparation of permanent AAM regulations.

(b) This Regulation is valid for an initial period of 2 years from its applicability date, that is until 9 November 2028.

(c) During that period, the AUTHORITY will monitor and evaluate the implementation of the AAM Sandbox, review the effectiveness and proportionality of this Regulation, and gather lessons learned.

(d) Not later than 6 months before expiry, the AUTHORITY will complete a structured review of this Regulation and decide to:

(1) extend its validity, with or without amendment;

(2) transfer some or all of its provisions into permanent CARs;

(3) replace it with a new regulatory framework;

(4) allow it to lapse, in which case no new Sandbox Approval will be issued after the expiry date; or

(5) convert this Regulation, with or without amendment, into a permanent Part of CAR-AAM providing an innovation pathway for future concepts.

(e) Where this Regulation is amended, extended, replaced or allowed to lapse, the AUTHORITY will adopt transitional measures for ongoing Sandbox Projects that ensure safety, legal certainty and continuity, including the maximum period for which existing Sandbox Approvals remain valid.

(f) Any extension of validity shall:

(1) not exceed 12 months at a time;

(2) be justified by documented evidence from performance data, Close-Out Reports and regulatory development needs; and

(3) be accompanied by an updated Regulatory Conversion Roadmap identifying which provisions will be transferred into permanent regulation and by when.

(g) The total validity of this Regulation, including extensions, shall not exceed 4 years. Any continuation beyond that period shall take the form of a permanent Part under CAR-AAM.SB.665(d)(5) or of a new regulation adopted in accordance with CAR 11.

AMC1 CAR-AAM.SB.665 – Review Methodology

(a) The structured review of CAR-AAM.SB should be based on:

(1) analysis of data and Close-Out Reports from Sandbox projects (Subpart L);

(2) input from internal CAA stakeholders (regulation, oversight, ANS, aerodromes, environment, legal, strategic planning);

(3) feedback from Sandbox Operators, UTM providers, vertiport operators and other stakeholders;

(4) developments at ICAO and other leading authorities (e.g. EASA, FAA) in AAM regulation and guidance.

(b) The AUTHORITY should document the review conclusions, including:

(1) key findings on the suitability and impact of the Sandbox framework;

(2) proposed changes to CAR-AAM.SB or related CARs; and

(3) proposed roadmap for future AAM regulatory development.

AMC2 CAR-AAM.SB.665 – Extension Discipline and Conversion Roadmap

(a) Where an extension is considered, the AUTHORITY should:

(1) identify which Sandbox provisions are ready for migration into permanent CARs;

(2) identify which provisions require additional evidence and why;

(3) set milestones and accountable owners for the conversion roadmap; and

(4) define transitional measures for projects that may extend beyond the expiry date.

(b) The AUTHORITY should avoid repeated extensions where stable evidence exists to support permanent regulatory adoption.

GM1 CAR-AAM.SB.665 – Managing the Two-Year Horizon

(a) The two-year validity of CAR-AAM.SB is intended to:

(1) encourage focused experimentation and learning within a defined timeframe;

(2) avoid long-term reliance on an experimental framework once sufficient experience has been accumulated; and

(3) drive timely development of permanent AAM regulations.

(b) Sandbox Operators should plan their projects and investments taking into account:

(1) the two-year horizon of this Regulation; and

(2) the possibility that resulting permanent regulations may differ from the experimental framework.

CAR-AAM.SB.670 Exemptions and Deviations

(a) In exceptional cases, the AUTHORITY may, in accordance with CAR 10, grant an exemption from a provision of this Regulation or of another CAR where:

(1) strict compliance would prevent or unduly hinder a Sandbox Project of clear safety, security, environmental or public-interest value; and

(2) an equivalent level of safety is demonstrated by alternative means.

(b) No exemption shall be granted from CAR-AAM.SB.170(c), CAR-AAM.SB.215, CAR-AAM.SB.220, CAR-AAM.SB.250(e) or CAR-AAM.SB.555, or from any provision implementing an ICAO Standard unless the State has notified a difference to ICAO in accordance with Article 38 of the Convention on International Civil Aviation.

(c) An exemption shall be granted in writing, specify the provisions concerned, its scope, duration, conditions and compensating measures, be supported by a documented risk assessment, and not extend beyond the validity of the Sandbox Approval.

(d) A deviation from a procedure in the Sandbox Operator's own approved documentation may be applied within the limits of the Sandbox Approval, in accordance with a deviation procedure approved by the AUTHORITY.

(e) The Sandbox Operator shall comply with all conditions attached to an exemption or deviation, monitor the associated risks, report any significant issue to the AUTHORITY without undue delay, and maintain an Exemption Register and a Deviation Log.

(f) Exemptions and deviations shall not be used to circumvent the intent of this Regulation or of any other CAR. Where an exemption proves to be a more appropriate way of achieving a safety objective, the AUTHORITY will consider amending the relevant rule in accordance with CAR 11.

AMC1 CAR-AAM.SB.670 – Use of CAR 10 in Sandbox Context

(a) When considering an exemption or deviation in the AAM Sandbox, the AUTHORITY should verify that:

(1) the requested flexibility is truly necessary to test an innovative concept or to address a specific operational, technical or environmental constraint that cannot reasonably be resolved within the existing provisions;

(2) the Sandbox Operator has demonstrated an equivalent or higher level of safety through a robust risk assessment and appropriate mitigations; and

(3) the exemption or deviation is limited in scope and duration and, where appropriate, is subject to enhanced monitoring and oversight.

(b) Exemptions or deviations granted in the Sandbox context should be periodically reviewed and may be withdrawn if:

(1) safety, security or environmental performance is unsatisfactory; or

(2) their continuation is no longer justified due to changes in the project, the operating environment or the applicable regulatory framework.

AMC2 CAR-AAM.SB.670 – Registers, Time Limitation and Follow-Up

(a) The Sandbox Operator should maintain, for the duration of the Sandbox project, at least the following records:

(1) a Deviation Log, covering deviations granted within the framework of the Sandbox Approval, including:

(i) the date and description of the deviation;

(ii) the reason and context;

(iii) the immediate controls and mitigating measures applied;

(iv) a reference to the supporting risk assessment; and

(v) evidence of closure or normalisation, where applicable;

(2) an Exemption Register, covering exemptions granted from CAR-AAM.SB or from other applicable regulatory requirements under CAR 10, including:

(i) the legal and regulatory basis for the exemption;

(ii) the scope and conditions of the exemption;

(iii) the compensating measures and limitations applied;

(iv) the time limitation or expiry date; and

(v) the outcome of periodic reviews.

(b) Deviations and exemptions should be time-bounded and subject to periodic review. As part of these reviews, the Sandbox Operator should:

(1) assess whether the underlying need for the deviation or exemption remains valid;

(2) evaluate the actual safety, security, environmental and operational performance associated with the deviation or exemption; and

(3) identify whether permanent changes to procedures, controls or the regulatory framework are warranted.

(c) Where experience shows that a deviation or exemption represents a more appropriate way of achieving the safety objectives of this Regulation, the Sandbox Operator should, in coordination with the AUTHORITY, consider initiating a formal change process under CAR-AAM.SB.655 and the applicable rulemaking procedures (CAR 11), with a view to incorporating the improved controls into the standard regulatory framework.

GM1 CAR-AAM.SB.670 – Examples

(a) Examples of potential deviations in a Sandbox context may include:

(1) the testing of a novel communication or surveillance solution that is not yet fully covered by existing CNS requirements, under strict limitations, specific operating conditions and enhanced monitoring; or

(2) operating under defined experimental limitations where full airworthiness certification is not yet completed, with appropriate compensating operational mitigations and clear constraints on the nature, scale and location of the operations.

(b) These examples underline that sandbox flexibility remains safety-driven and controlled, and does not constitute a blanket relaxation of regulatory discipline or a general waiver from the applicable Civil Aviation Regulations.

CAR-AAM.SB.675 Entry into Force, Amendment and Document Control

(a) This Regulation shall come into force on 1 November 2026 (the effective date). It shall become applicable on 10 November 2026, unless otherwise specified for individual provisions within this Regulation.

(b) From its applicability date, this Regulation applies to all Sandbox operations and approvals, subject to the transitional arrangements in CAR-AAM.SB.650.

(c) In accordance with CAR-AAM.SB.665(b), this Regulation expires on 9 November 2028 unless it is extended, replaced or allowed to lapse in accordance with CAR-AAM.SB.665.

(d) Any amendment, suspension or replacement of this Regulation shall be carried out in accordance with CAR 11 and the Civil Aviation Law. AMC and GM may be issued or amended by decision of the AUTHORITY following consultation proportionate to the change.

(e) The AUTHORITY will ensure that the current version and amendment status of this Regulation are clearly identified, that superseded versions are archived and traceable, and that stakeholders are informed of changes in a timely manner.

(f) References in this Regulation to national or international documents are to those documents as amended from time to time, unless the AUTHORITY specifies otherwise.

APPENDICES

(a) Appendix 1 is published with this Regulation. Its forms and checklists are recommended templates; equivalent content in another form acceptable to the AUTHORITY is accepted in accordance with CAR-AAM.SB.155(c).

(b) Appendix 2, Part A (Risk Tolerability Matrix and Risk Acceptance Levels) and Part B (Mandatory List of Reportable Occurrences) are mandatory, subject to CAR-AAM.SB.200(b)(4). The templates listed in Appendix 2, Part C are recommended.

(c) Appendices 3 to 10 specify the minimum content to be provided. The AUTHORITY will publish recommended templates for them by decision in accordance with CAR-AAM.SB.675(d). Until a template is published, the content listed shall be provided in a form acceptable to the AUTHORITY.

(d) Appendix 11 is mandatory.

Appendix	Title	Status	Minimum content
1	Entry, Governance and Approval Toolkit (Subparts A to C)	Published – recommended	Forms F1-01 to F1-13: Sandbox Supplement to Form AWR-033; eligibility verification; Complexity Level self-assessment; Applicability and Compliance Matrix; Phase Gate checklist; Notifiable and Major Change forms; AltMoC application; TT Assessment Report; Interface Register, Decision Log, Escalation Tree and Inter-Agency Readiness Statement; Decision Record; reconsideration request; public register and tracking
2	Safety and Security Risk Management and Occurrence Toolkit (Subpart D)	Parts A and B mandatory; Part C recommended	Risk tolerability matrix and acceptance levels; mandatory list of reportable occurrences; integrated hazard and threat register; residual risk acceptance statement; SORA submission and OSO compliance template; occurrence report and follow-up forms; security programme outline
3	Airworthiness Toolkit (Subpart E)	Minimum content	Airworthiness Basis Declaration; Sandbox Flight Permit application and flight conditions form; configuration and software baseline record; modification log; automation and AI function declaration under SB.280
4	Flight Operations and OCC Toolkit (Subpart F)	Minimum content	Operations Manual contents list; OCC capability statement, including Shared OCC Facility arrangements; training and checking programme template; Sandbox Remote Pilot Authorisation application; energy policy template; dangerous goods policy statement; emergency exercise report
5	Vertiport and Landing Site Toolkit (Subpart G)	Minimum content	Site assessment checklist; vertiport operations manual contents; charging infrastructure checklist; emergency plan template
6	ANS, UTM and CNS Toolkit (Subpart H)	Minimum content	Model LOA; ICD template; USSP designation application; interim UTM arrangement statement; C2 Link performance statement; aeronautical data submission form

Appendix	Title	Status	Minimum content
7	Data, Digital Services and Cybersecurity Toolkit (Subpart I)	Minimum content	Data recording specification; DSP register and criticality assessment; cybersecurity evidence pack template; cyber incident report form; data protection impact assessment outline; cyber risk assessment methodology model
8	Environmental and Community Toolkit (Subpart J)	Minimum content	Environmental screening form; noise data submission form; community engagement plan; complaint log format
9	Economic, Insurance and Consumer Toolkit (Subpart K)	Minimum content	Business case summary; insurance certificate format; passenger information leaflet outline; complaints and refund policy checklist
10	Monitoring, Close-Out and Transition Toolkit (Subparts L and M)	Minimum content	Performance Monitoring Plan; periodic report template; Close-Out Report structure; Sandbox Conversion Annex template; wind-down plan template
11	Model Sandbox Approval	Mandatory	Mandatory format of the Sandbox Approval (see Appendix 11)

APPENDIX 1 – ENTRY, GOVERNANCE AND APPROVAL TOOLKIT

This Appendix contains the forms, checklists and records supporting Subparts A to C of CAR-AAM.SB. In accordance with CAR-AAM.SB.155(c), applicants should use these templates; equivalent content in another form acceptable to the AUTHORITY is also accepted. Fields shown in square brackets are guidance and should be replaced or deleted. Checklist entries are completed as Y (met), N (not met) or N-A (not applicable), with a reference to the evidence relied upon. Applications for a Sandbox Approval are made on Form AWR-033 (Route C); the forms of this Appendix contain only Sandbox-specific information and do not repeat Form AWR-033 (GM2 CAR-AAM.SB.155). The AUTHORITY uses the forms in accordance with CAA-SOP-AAM.

Forms and checklists in this Appendix

Ref.	Title	Rule reference
F1-01	Sandbox Supplement to Form AWR-033	CAR-AAM.SB.150, SB.155, SB.157
F1-02	Eligibility Verification (AUTHORITY use)	CAR-AAM.SB.150
F1-03	Complexity Level Self-Assessment	CAR-AAM.SB.157
F1-04	Applicability and Compliance Matrix	CAR-AAM.SB.020(d) and (e)
F1-05	Phase Gate Package Checklist	CAR-AAM.SB.165(c) and (d)
F1-06	Notifiable Change Notification	CAR-AAM.SB.180(c) and (g)
F1-07	Major Change Application	CAR-AAM.SB.180(d), (g) and (h)
F1-08	Alternative Means of Compliance (AltMoC) Application	CAR-AAM.SB.115
F1-09	TT Assessment Report	CAR-AAM.SB.105(d), SB.160
F1-10	Inter-Agency Interface Register and Decision Log	CAR-AAM.SB.125, AMC1 SB.125
F1-11	Decision Record and Sandbox Approval Issue	CAR-AAM.SB.160(c) and (d), SB.165, SB.135
F1-12	Request for Reconsideration	CAR-AAM.SB.145
F1-13	Public Register Entry and Application Tracking	CAR-AAM.SB.140(b), SB.135

Associated spreadsheet: the Applicability and Compliance Matrix (F1-04), the Phase Gate checklist (F1-05), the Interface Register and Decision Log (F1-10) and the application tracking sheet (F1-13) are also provided as fillable worksheets in the Appendix 1 workbook.

F1-01 – Sandbox Supplement to Form AWR-033

Rule reference: CAR-AAM.SB.150, SB.155, SB.157

Submitted with Form AWR-033 (Route C) as attachment AT18 and signed by the Accountable Manager. This Supplement contains only Sandbox-specific information: do not repeat information given in Form AWR-033 (GM2 CAR-AAM.SB.155). Detail is proportionate to the Complexity Level (AMC2 CAR-AAM.SB.155). Write "N/A" with a reason where a section does not apply.

Section 1 – Link to Form AWR-033 and applicant

Form AWR-033 reference and date	
Applicant (as in AWR-033 A1.1)	
Ownership and control (shareholders above 10 %; parent company)	
Consortium agreement (SB.150(c))	[document; clauses giving the applicant control of safety-critical elements]
Sandbox Programme and Programme Coordination Office, if any (SB.127)	
Additional eligibility conditions of the Programme met (SB.150(d))	[Y / N / N-A]

Section 2 – Sandbox Project and regulatory learning

Project title	
Learning objectives and intended regulatory outcome	[linked to the Regulatory Learning Plan questions listed in AWR-033 B5.1]
Proposed duration	[months, not exceeding 24 (SB.165(e))]
Proposed Complexity Level	[L1 / L2 / L3 – F1-03]
Target CAR-AAM Category	[as in AWR-033 item 0.8; instrument at transition (AMC1 CAR-AAM.SB.157)]

Section 3 – Phasing plan and Stop Conditions (SB.165, SB.170, SB.175)

Phase	Scope and limitations	Entry criteria	Exit criteria	Planned dates
0 Ground, bench and integration testing				
1 Limited operations in a segregated volume				
2 BVLOS in defined corridors or volumes with enhanced monitoring				
3 Expanded density and complexity (night, weather, automation)				
4 Entry into service (SB.170)				

Stop Conditions are objective and measurable. When one is met, the affected operations stop and the AUTHORITY is notified within 24 hours (SB.175).

Indicator	Threshold	Phase(s)	Action on trigger
C2 link loss events	[e.g. > n per 100 flight hours]		
Conformance deviations or containment breaches			
Accident or serious incident	Any	All	Suspend all operations
UTM or safety-critical DSP degradation beyond assumptions			

Indicator	Threshold	Phase(s)	Action on trigger
Cyber incident affecting a safety-critical system	Any	All	
GNSS interference events			
Battery thermal events			
Emergency exercise failed with unresolved critical finding			
Community impact (e.g. complaints per 1 000 movements)			

Section 4 – Operational design domain

Environmental conditions	[wind, temperature, visibility, dust, precipitation, light]
Geographic and airspace conditions	[areas, corridors, heights, airspace classes – consistent with AWR-033 D and E]
Time-of-day, traffic and infrastructure conditions	
Detection of exit from the ODD and response	

Section 5 – Airworthiness basis (SB.250, SB.252, SB.280)

Airworthiness Basis Declaration reference (Appendix 3)	[standards, special conditions, means of compliance, limitations, deviations]
Sandbox Flight Permit application, if applicable	[flight conditions; design organisation declaration; flight test programme; test pilot qualifications – no passengers]
Items addressed	[energy storage and thermal runaway; flight controls and automation; C2 and detect-and-avoid; aircraft information security; Oman environment; noise]
Automation and AI function declaration (SB.280; Appendix 3)	[reference; automation level as in AWR-033 C2.12]

Section 6 – Operations control centre (SB.305)

Level	Minimum capability	Provided	Reference
L1	Nominated operational controller; basic tracking and communications; documented flight release	[Y/N]	
L2	Dedicated OCC during operating hours; continuous tracking with alerting; structured coordination with ATS, USSP and vertiport operators; duty handover	[Y/N]	
L3	OCC staffed while airborne; redundant critical systems and tested backup; automated conformance monitoring; integrated ATS and USSP coordination	[Y/N]	
Shared OCC	Facility and written agreement or ICD (SB.305(f))	[Y/N/N-A]	

Section 7 – Vertiports and landing sites (SB.350 to SB.365)

Site (AWR-033	Authorisation route (CAR	Site operator and	FATO / TLOF	Emergency plan	Charging /
D2 no.)	139 / Sandbox)	agreement	design reference	approved by CDAA	energy

Section 8 – Persons on board and entry into service (if applicable)

A type certificate is mandatory for passenger carriage and cannot be exempted (SB.250(e), SB.670(b)). No passenger may be carried under a Sandbox Flight Permit.

Requirement	Rule	Status / reference
Type certificate issued or validated by the AUTHORITY	SB.250(e)	
Pilot licence with category and type rating; Class 1 medical	SB.310(c)	
Passenger and baggage screening	SB.225(b)(3)	
Safety briefing, restraint, manifest, assistance	SB.330(e)	
Alternate landing site for every flight; Final Reserve Energy	SB.330(a), (c); AMC1 SB.330	
Emergency locator transmitter	SB.425(b)	
Crash-protected flight recorder	SB.450(b)	
Consumer information, complaints and refund policy	SB.560	
EIS Readiness Dossier	SB.170(d)	

Section 9 – Sandbox management documents

Document	Rule	Reference and version	Enclosed
Safety Case (L2 and L3)	SB.155(b)(4)		[Y/N]
SMS manual and security programme (may be AWR-033 AT12)	SB.210, SB.225		[Y/N]
Cybersecurity evidence pack summary (asset inventory, risk assessment, configuration baseline, patching, logging, incident response, third-party assurance, update governance)	SB.460		[Y/N]
Register of digital service providers with criticality	SB.455		[Y/N]
Environmental screening and noise data	SB.500, SB.505		[Y/N]
Community engagement plan	SB.510		[Y/N]
Business model summary and consumer information	SB.550, SB.560		[Y/N]
Performance Monitoring Plan	SB.600		[Y/N]
Change management procedure (Minor, Notifiable, Major Changes)	SB.180		[Y/N]
Wind-down plan and financial guarantee where required	SB.615		[Y/N]

Section 10 – Confidentiality claim (SB.140(c))

Information claimed commercially or security sensitive	[document / section]
Reason for the claim	

Reason for the claim

Section 11 – Declaration

I declare that the applicant meets the eligibility requirements of CAR-AAM.SB.150, that the information in this Supplement is complete, accurate and consistent with Form AWR-033 referenced in Section 1, that the AUTHORITY will be notified without delay of any change before a decision is issued, and that operations will be conducted only under a Sandbox Approval and within its conditions, phases and Stop Conditions.

Role	Name	Signature	Date
Accountable Manager			

For AUTHORITY use: receipt, completeness and decision are recorded in Form AWR-033 Part J and in F1-02, F1-09, F1-11 and F1-13.

F1-02 – Eligibility Verification

Rule reference: CAR-AAM.SB.150

Completed by the TT from Form AWR-033 Part A (A1, A5, A6), attachments AT01, AT02, AT11 and AT12, and F1-01 Section 1. The applicant does not complete this form; the AUTHORITY may interview the nominated persons.

Ref.	Item to be verified	Y / N / N-A	Evidence reference	Remarks
1	Accountable Manager has corporate authority and financial control (SB.150(b)(1))			
2	Each nominated person is acceptable to the AUTHORITY and not overcommitted			
3	Technical, operational and managerial capability demonstrated (SB.150(b)(2))			
4	Access to or control of aircraft, infrastructure and services demonstrated (SB.150(b)(3))			
5	SMS and security programme in place (SB.150(b)(4))			
6	Financial resources, including wind-down, demonstrated (SB.150(b)(5))			
7	Insurance evidence provided (SB.150(b)(6), SB.555)			
8	Compliance and integrity record acceptable (SB.150(b) (7))			
9	For consortia: single Sandbox Operator with contractual control (SB.150(c))			

Interview with nominated persons held	[date; attendees]
Overall conclusion	[eligible / eligible with conditions / not eligible – reasons]

Role	Name	Signature	Date
TT assessor			
TT Lead			

F1-03 – Complexity Level Self-Assessment

Rule reference: CAR-AAM.SB.157

The Complexity Level is the highest level indicated by any criterion. The applicant proposes; the AUTHORITY assigns and may assign a higher level with written reasons.

Criteria

Criterion	L1	L2	L3	Data in Form AWR-033	Level claimed
Persons carried	None	None	Any passenger, or crew other than test crew	AWR 0.6 Q14	
Population overflown	Sparsely populated / controlled ground area	Populated	Congested or assemblies of people	AWR D5.1, D5.5	
Airspace	Segregated or uncontrolled	Uncontrolled with UTM, or controlled with LOA	Integrated with ATS traffic or near a major aerodrome	AWR E1, E2	
SORA SAIL	I to II	III to IV	V to VI	AWR F2 (Step 7)	
Degree of human intervention	Pilot able to intervene at all times	Pilot on the loop	No real-time human intervention in safety-critical functions	AWR B3.2, C2.12	
Aircraft simultaneously airborne	1 to 3	4 to 10	More than 10	AWR B3.3	
Infrastructure	Landing sites without public access	Vertiport with restricted public access	Vertiport with public access or at an aerodrome	AWR D2; F1-01 Section 7	

Result

Highest level indicated by the criteria

Highest level indicated by the criteria	
Complexity Level proposed by the	
applicant	
Target CAR-AAM Category (AWR-033 item 0.8) consistent with the level proposed (AMC1 CAR-AAM.SB.157)	[Y / N]
Justification where a lower level is	
proposed	
Consequences accepted (application	
depth, SMS and OCC arrangements, oversight intensity, SB.135 timelines)	

For AUTHORITY use only

Complexity Level assigned Reasons where higher than proposed (SB.157(d)) Review due at (Phase Gate / Major Change)

Declaration and signature

Role	Name	Signature	Date
Accountable Manager			

Role	Name	Signature	Date
TT Lead			

F1-04 – Applicability and Compliance Matrix

Rule reference: CAR-AAM.SB.020(d) and (e)

Maintained for each phase. Updated before any Major Change, Phase Gate or EIS Readiness Review, and within 30 days of a Notifiable Change. The spreadsheet version of this matrix is provided in the Appendix 1 workbook.

Matrix format

Requirement (rule / CAR)	Applicable	Means of compliance	Evidence reference	Monitoring method	Reporting frequency	Target CAR-AAM Part
CAR-AAM.SB.300(b) Operations Manual	Yes	Full compliance	OM Ed. 1 Rev. 2, section 4	Internal audit	Annual	CAR-AAM.SPEC / LUC
CAR-AAM.SB.330 Final Reserve Energy	Yes	AltMoC approved 12/06/2026	AltMoC-003; flight test report FT-19	Flight data monitoring	Monthly	CAR-AAM.SPEC
CAR-AAM.SB.325 Dangerous goods	No	Not applicable – no DG carried	CONOPS section 2.4	Acceptance procedure	Per flight	CAR-AAM.SPEC
[ ]	[ ]	[ ]	[ ]	[ ]	[ ]	[ ]

Means of compliance shall be stated as one of: full compliance; AMC; AltMoC (with approval reference); exemption under CAR 10 (with reference); or not applicable with justification. The first three rows above are worked examples and shall be deleted before submission.

Control

Matrix version and date Phase to which it applies Changes since previous version Prepared by / verified by

F1-05 – Phase Gate Package Checklist

Rule reference: CAR-AAM.SB.165(c) and (d)

Completed by the Sandbox Operator and verified by the TT and SOT before a phase is authorised. A phase is authorised only where entry criteria are met on objective evidence and, where required, an Inter-Agency Readiness Statement has been issued.

Sandbox Project / approval number

Sandbox Project / approval number	
Phase applied for	[0 / 1 / 2 / 3 / 4 (EIS)]
Date of submission	

Date of submission

Phase Gate package (SB.165(c))

Ref.	Item to be verified	Y / N / N-A	Evidence reference	Remarks
1	Updated CONOPS, ODD and operational limitations (volumes, altitudes, routes, times)			
2	Updated hazard and threat register and residual risk acceptance statement signed by the Accountable Manager			
3	SORA outputs and OSO compliance evidence			
4	Emergency response plan and evidence of exercises relevant to the phase			
5	Evidence of OCC and Operational Control readiness, including exercise records			
6	Validated ANS, UTM and C2 CSP interfaces, including degraded modes (LOA, ICD)			
7	Cybersecurity evidence pack, with no unresolved critical vulnerability			
8	Training, checking and licensing records for all operational roles			
9	Evidence of vertiport and landing site readiness			
10	Occurrence and performance reporting readiness			
11	Confirmation of insurance in force for the phase			
12	Updated Applicability and Compliance Matrix			
13	Inter-Agency Readiness Statement issued, where the phase depends on inter-agency interfaces (SB.125(c), SB.165(d))			
14	Security programme implemented and in force for the phase (SB.150(b)(4), SB.225)			
Additional for Phase 4 (EIS) – CAR-AAM.SB.170				
15	EIS Readiness Dossier covering each domain of SB.015(b), with traceable safety argument			
16	Aircraft holds a type certificate issued or validated by the AUTHORITY (SB.250(e))			

Ref.	Item to be verified	Y / N / N-A	Evidence reference	Remarks
17	Pilots licensed in accordance with SB.310(c); remote pilots authorised under SB.310(b)			
18	Passenger and baggage screening arrangements implemented (SB.225)			
19	Passenger safety briefing, mass and balance and manifest procedures (SB.330(e))			
Closure of the preceding phase				
20	Exit criteria of the preceding phase met and evidenced			
21	Open findings from inspections and audits closed, or accepted with mitigations			
22	Occurrences from the preceding phase analysed and corrective actions implemented			
23	No Stop Condition active (SB.175)			
24	Interim Sandbox Conversion Annex submitted (SB.655(c))			

TT recommendation (SB.105(d)(4))

Recommendation	[GO / GO with conditions / NO-GO]
Conditions and limitations recommended	
Stop Conditions for the phase	
Evidence relied upon (document, version, date)	

Declaration and signature

Role	Name	Signature	Date
Accountable Manager			
SOT inspector			
TT Lead			
Decision-maker			

F1-06 – Notifiable Change Notification

Rule reference: CAR-AAM.SB.180(c) and (g)

Submitted at least 10 working days before implementation. The AUTHORITY may reclassify the change as a Major Change within that period.

Sandbox Approval number Change reference and date Planned implementation date Description of the change Reason for the change Classification applied and criteria used (SB.180(a))

Change impact assessment (SB.180(g))

Domain	Impact	Mitigation	Evidence
Safety (hazards, risk rating)			
Security			
Cybersecurity			
Environment and community			
Interfaces (ANSP, USSP, C2 CSP, DSP, vertiport)			
Personnel, training and licensing			
Documentation (CONOPS, OM, procedures)			

Control

Updated documents and versions

Updated documents and versions	
Rollback plan and temporary limitations	
Compliance Matrix updated (within 30 days)	[Y/N – date]

Declaration and signature

Role	Name	Signature	Date
Nominated person (safety)			
Accountable Manager			

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Date received Classification confirmed / reclassified as Major (SB.180(c)) Conditions imposed Assessor / date

F1-07 – Major Change Application

Rule reference: CAR-AAM.SB.180(d), (g) and (h)

A Major Change shall not be implemented until approved in writing by the AUTHORITY. Design changes are also subject to CAR-AAM.SB.260.

Sandbox Approval number Change reference and date Proposed implementation date

Category of Major Change (tick all that apply)

Ref.	Category (SB.180(d))	Applies
1	New AAM Aircraft type, change of Automation Level, or change to flight control or other safety-critical software baselines	[ ]
2	Change to Operational Volumes, routes, altitudes or airspace class, or increase in density or complexity beyond the approved phase	[ ]
3	Introduction of passenger carriage, BVLOS, night operations, dangerous goods or new mission types	[ ]
4	Change of USSP, C2 CSP or safety-critical DSP, of C2 Link architecture, or of ATS interface design	[ ]
5	Change to emergency or contingency concepts, or to detect-and-avoid assumptions	[ ]
6	Change of Accountable Manager, or of ownership or control of the Sandbox Operator	[ ]
7	New vertiport or landing site	[ ]
8	Other change that may invalidate the basis of the Sandbox Approval	[ ]

Impact assessment and evidence

Domain	Impact	Mitigation	Verification evidence
Safety and residual risk			
Security and cybersecurity			
Airworthiness and configuration			
Operations and procedures			
Personnel and training			
Interfaces and agreements			
Environment and community			
Insurance and liability			

Supporting documents

Updated CONOPS and ODD Updated hazard and threat register and SORA outputs Updated Applicability and Compliance Matrix Rollback plan and temporary limitations (SB.180(g)(4), (h)) Design change approval reference (SB.260(b)), if applicable

Declaration and signature

Role	Name	Signature	Date
Accountable Manager			

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TT Change Classification Record reference (SB.105(d)(5))	
Decision	[Approved / Approved with conditions / Refused]

Conditions and limitations	
Sandbox Approval amended (version, date)	

F1-08 – Alternative Means of Compliance (AltMoC) Application

Rule reference: CAR-AAM.SB.115

An AltMoC shall not be used until approved in writing by the AUTHORITY. Approved AltMoCs may be published without commercially sensitive detail.

Rule and AMC concerned Objective of the rule, as understood by the applicant Full description of the proposed AltMoC Demonstration that the rule objective is met Supporting risk assessment reference Compensating measures and limitations Monitoring and review arrangements Proposed validity

Declaration and signature

RoleNameSignatureDate

Role		Name	Signature	Date
Nominated person (compliance)				
Accountable Manager				
For AUTHORITY use only				
Assessment summary				
Decision and AltMoC reference number				
Conditions				
Publication (with sensitive detail removed)	[Y/N]			

F1-09 – TT Assessment Report

Rule reference: CAR-AAM.SB.105(d), SB.160

Produced by the Sandbox Technical Team for each application, Phase Gate and Major Change. Each output references the evidence relied upon by document identifier, version and date.

Sandbox Project / application reference	
Assessment trigger	[Application / Phase Gate / Major Change / EIS]
TT members participating (name, discipline)	
Period of assessment	

Discipline assessments

Discipline	Findings	Residual concerns	Conditions recommended	Assessor
Air operations				
Airworthiness				
Personnel licensing				
ANS, ATM and UTM				
Aerodromes and vertiports				
Security and cybersecurity				
Dangerous goods				
Safety management				
Environment				
Legal and enforcement				
Economics and strategy				

Integrated Risk Summary (SB.105(d)(2))

Hazard / threat ref.Risk before mitigationKey mitigationsResidual riskAcceptance level (AMC2 SB.200)

Interface Readiness Statement (SB.105(d)(3))

ANSP / ATS units	[ready / conditional / not ready]
USSP	
C2 CSP	
Safety-critical DSPs	
Vertiport operators	
Emergency services	

Evaluation against SB.160(a)

Eligibility (SB.150)	[pass / fail]
Completeness and quality of the application	
Robustness of risk assessment and mitigations	

Safety, security and environmental risk profile	

AUTHORITY oversight capacity (SB.100(b) (1), SB.130) National priorities, learning and socio-economic value (considered only after the above)

Recommendation

Recommendation	[Approve / Approve with conditions / Request information / Refuse]
Complexity Level recommended	
Phases and limitations recommended	
Stop Conditions recommended	
Monitoring and reporting requirements recommended	

Declaration and signature

Role	Name	Signature	Date
TT Lead			
Head of designated Directorate General			
Decision-maker			

F1-10 – Inter-Agency Interface Register and Decision Log

Rule reference: CAR-AAM.SB.125, AMC1 SB.125

Maintained by the Inter-Agency AAM Sandbox Cell as controlled records available for oversight, audit and investigation. Spreadsheet versions are provided in the Appendix 1 workbook.

Interface Register

Ref.EntityInstrument (MoU / LOA / ICD)ScopeStatusValid toOwner

Decision Log

Ref.DateMatterDecision / constraintRationaleParticipants

Escalation and Duty Contact Tree

Level	Function	Name	Duty telephone (24/7)	Notification trigger
1 – Operational				
2 – Managerial				
3 – CAA duty officer				
4 – Inter-Agency Cell				
5 – Emergency services				

Inter-Agency Readiness Statement (SB.125(c))

Phase concerned

Phase concerned	
Required approvals, interfaces and coordination arrangements in place	[Y/N – reference]
Joint procedures, including degraded-mode and contingency, agreed	[Y/N – reference]
Emergency response roles and communication paths established	[Y/N – reference]
Unresolved critical gaps or dependencies	
Statement issued / withheld	

Statement issued / withheld

Declaration and signature

Role	Name	Signature	Date
Inter-Agency Cell Chair			
ANSP representative			
Security authority representative			
Emergency services representative			

F1-11 – Decision Record and Sandbox Approval Issue

Rule reference: CAR-AAM.SB.160(c) and (d), SB.165, SB.135

Completed by the decision-maker. Where the application is refused, the record states the reasons and refers to the reconsideration procedure under CAR-AAM.SB.145.

Application reference	
Date application complete	
Target decision date (SB.135(b))	
Actual decision date; where exceeded, notification to applicant (SB.135(c))	
Decision	[Approve / Approve with conditions / Request information / Refuse]
Reasons (mandatory for refusal)	
Sandbox Approval number issued (Appendix 11)	
Complexity Level	
Target CAR-AAM Category (SB.157(e))	
Validity (not exceeding 24 months, SB.165(e))	
Phases authorised at issue	
Entry in public register (SB.140(b))	[date]
Fee received (SB.140(a))	

Declaration and signature

Role	Name	Signature	Date
Decision-maker			
Legal review			

F1-12 – Request for Reconsideration

Rule reference: CAR-AAM.SB.145

Submitted within 30 days of notification of the decision. Reconsideration is carried out by an official not involved in the original decision, within 30 working days. A request does not suspend a decision taken for immediate safety or security reasons.

Applicant / Sandbox Operator Decision concerned and date of notification Date of this request (within 30 days) Grounds for reconsideration New information or evidence provided Outcome sought

Declaration and signature

Role	Name	Signature	Date
Accountable Manager			

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Reviewing official (not involved in original decision)	
Date received / decision due (30 working days)	
Outcome	[Decision upheld / varied / withdrawn]
Reasons	
Notification to applicant (date)	

F1-13 – Public Register Entry and Application Tracking

Rule reference: CAR-AAM.SB.140(b), SB.135

Maintained by the AUTHORITY. Commercially sensitive and security-sensitive information is not published.

Public register entry

Field	Content	Published
Sandbox Operator		Yes
Sandbox Approval number		Yes
Use case		Yes
General operating area		Yes
Current phase		Yes
Validity dates		Yes
Suspension or revocation		Yes
Aircraft registrations		No – security sensitive
Vertiport coordinates		No – security sensitive
Commercial terms		No – commercially sensitive

Application tracking (SB.135)

Milestone	Target	Actual	Clock stopped (awaiting applicant)	Remarks
Acknowledgement	10 working days			
Completeness statement	10 working days			
Decision – initial approval	L1 30 / L2 60 / L3 90 working days			
Decision – Phase Gate or Major Change	L1 15 / L2 30 / L3 45 working days			
Decision – EIS Readiness Review	L1 30 / L2 45 / L3 60 working days			

APPENDIX 2 – SAFETY AND SECURITY RISK MANAGEMENT AND OCCURRENCE TOOLKIT

Parts A and B of this Appendix are mandatory in accordance with CAR-AAM.SB.200(b)(4) and CAR-AAM.SB.215(b) (2). Part C lists the recommended templates.

Part A – Risk Tolerability Matrix and Risk Acceptance Levels

A.1 Severity of consequences

Category	Meaning	Indicative AAM consequences
A	Catastrophic	Fatality of one or more persons on board or on the ground; AAM Aircraft destroyed; collision with a manned aircraft.
B	Hazardous	Serious injury; large reduction in safety margins; major damage to the AAM Aircraft or to third-party property; loss of containment beyond the Ground Risk Buffer.
C	Major	Significant reduction in safety margins; minor injury; exit from the Operational Volume within the Ground Risk Buffer; event with serious incident potential.
D	Minor	Nuisance; operating limitations; use of contingency procedures; exit from the flight geography into the contingency volume.
E	Negligible	Few or no consequences for safety.

A.2 Probability of occurrence

Level	Meaning	Qualitative definition
5	Frequent	Likely to occur many times; has occurred frequently.
4	Occasional	Likely to occur sometimes; has occurred infrequently.
3	Remote	Unlikely to occur, but possible; has occurred rarely.
2	Improbable	Very unlikely to occur; not known to have occurred.
1	Extremely improbable	Almost inconceivable that the event will occur.

Where quantitative data are available from operations, flight testing or type data, the Sandbox Operator should define the probability levels per flight hour or per flight and state them in its Safety Management System documentation.

A.3 Risk tolerability matrix

Probability	A – Catastrophic	B – Hazardous	C – Major	D – Minor	E – Negligible
5 – Frequent	5A INT	5B INT	5C INT	5D T3	5E T2
4 – Occasional	4A INT	4B INT	4C T3	4D T2	4E T1
3 – Remote	3A INT	3B T3	3C T2	3D T1	3E ACC
2 – Improbable	2A T3	2B T2	2C T1	2D ACC	2E ACC
1 – Extremely improbable	1A T2	1B ACC	1C ACC	1D ACC	1E ACC

Key: INT – Intolerable; T3 – Tolerable, highest category; T2 – Tolerable, upper region; T1 – Tolerable, lower region; ACC – Acceptable.

A.4 Risk acceptance levels

Band	Region	Acceptance	Required action
INT	Intolerable	Not acceptable	The operation shall not proceed until the risk has been mitigated to a lower band.

Band	Region	Acceptance	Required action
T3	Tolerable – highest category	Decision of the AUTHORITY	Submitted to the AUTHORITY with the proposed controls; the operation proceeds only if the AUTHORITY accepts the risk in the Sandbox Approval or Phase Gate decision.
T2	Tolerable – upper region	Accountable Manager	Accepted in writing by the Accountable Manager; reviewed at least annually and after any related occurrence.
T1	Tolerable – lower region	Safety manager	Accepted by the safety manager; monitored through the Safety Management System.
ACC	Acceptable	No acceptance required	No further action beyond normal monitoring.

Security threats are assessed using the same matrix, with likelihood in place of probability, consistent with the national aviation security risk assessment methodology. An alternative matrix accepted under CAR-AAM.SB.200(b)(4) shall map to the acceptance levels of A.4.

Part B – Mandatory List of Reportable Occurrences

In addition to the occurrences listed in CAD 01-02 and any events specified in the Sandbox Approval, the following occurrences shall be reported in accordance with CAR-AAM.SB.215. A follow-up report is due within 30 days and a final report within 90 days (CAR-AAM.SB.215(b)(3) and (4)).

No.	Category	Reportable occurrence	Deadline
1	Accidents and serious incidents	Any accident or serious incident, including any collision, fatality or serious injury, or AAM Aircraft destroyed or substantially damaged.	Immediately; CAR 13
2	C2 Link	Unintentional loss of C2 Link beyond the lost-link time defined in the Operations Manual; any activation of the lost-link procedure; repeated C2 Link instability.	72 h
3	Containment	Exit from the flight geography requiring contingency procedures; any exit from the Operational Volume; geo-fence or containment breach; activation of a flight termination system.	72 h; immediately if the Ground Risk Buffer is exceeded
4	Airspace	Unauthorised entry into controlled, restricted or prohibited airspace; deviation from an ATC clearance or UTM flight authorisation; significant deviation from approved routes, heights or times.	72 h
5	Separation and detect-and-avoid	Airprox or loss of separation with a manned aircraft or another unmanned aircraft; detect-and-avoid alert requiring an avoidance manoeuvre; detect-and-avoid failure.	72 h; immediately for airprox with a manned aircraft
6	Navigation	GNSS jamming, spoofing or degradation affecting navigation, surveillance or remote identification.	72 h
7	Energy and batteries	Battery thermal runaway, venting, smoke or fire in flight, on the ground or during charging; landing with less than the Final Reserve Energy; unplanned energy depletion.	72 h; immediately for fire
8	Aircraft systems and automation	Failure of flight controls, propulsion or power distribution; uncommanded or unintended automated behaviour; exit from the ODD not detected by the system; failure of a safety-critical software function.	72 h

No.	Category	Reportable occurrence	Deadline
9	UTM and digital services	Failure or degradation of UTM, USSP, C2 CSP or safety-critical DSP services affecting safety or security beyond agreed assumptions; unresolved conformance monitoring alerts.	72 h
10	Security and cybersecurity	Cyber incident affecting safety-critical systems, command integrity, identity or operational data; unauthorised access to aircraft, remote pilot station, OCC or systems; act of unlawful interference.	24 h to the AUTHORITY and to the competent security or cybersecurity authority (CAR-AAM.SB.460(c))
11	Vertiports and landing sites	Loss of vertiport lighting, or FATO or TLOF obstruction or incursion, during operations; activation of rescue and firefighting services; injury to ground personnel.	72 h
12	Payload and dangerous goods	Dangerous goods occurrence or undeclared dangerous goods; dropped object; loss of an external load or payload.	72 h
13	Emergency and contingency	Activation of the emergency response plan; emergency or forced landing outside a planned site; use of degraded-mode	72 h
		procedures.	
14	Personnel	Incapacitation of a pilot, remote pilot or OCC controller; fatigue-related event; operation beyond flight time or duty limits.	72 h
15	Wildlife and environment	Bird or wildlife strike; environmental event judged relevant by the Sandbox Operator or the AUTHORITY.	72 h
16	Passengers	Passenger injury, passenger-related safety event or failure of passenger safety equipment, where passengers are carried.	72 h
17	Stop Conditions	Any Stop Condition met, and any restriction or suspension applied under CAR-AAM.SB.175.	24 h (SB.175(c))

Part C – Recommended Templates

The AUTHORITY will publish the following recommended templates. Until a template is published, the content shall be provided in a form acceptable to the AUTHORITY:

(a) integrated hazard and threat register (GM1 CAR-AAM.SB.200);

(b) residual risk acceptance statement signed by the Accountable Manager (CAR-AAM.SB.200(d));

(c) SORA submission and OSO compliance template (CAR-AAM.SB.205);

(d) occurrence report and follow-up forms (CAR-AAM.SB.215); and

(e) security programme outline (CAR-AAM.SB.225).

APPENDIX 3 – AIRWORTHINESS TOOLKIT

Status: minimum content (Subpart E). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) Airworthiness Basis Declaration (CAR-AAM.SB.250);

(b) Sandbox Flight Permit application and flight conditions form (CAR-AAM.SB.252);

(c) configuration and software baseline record (CAR-AAM.SB.260);

(d) modification log (CAR-AAM.SB.260, CAR-AAM.SB.265); and

(e) automation and AI function declaration (CAR-AAM.SB.280).

APPENDIX 4 – FLIGHT OPERATIONS AND OCC TOOLKIT

Status: minimum content (Subpart F). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) Operations Manual contents list (CAR-AAM.SB.300);

(b) OCC capability statement, including any Shared OCC Facility arrangements (CAR-AAM.SB.305);

(c) training and checking programme template (CAR-AAM.SB.310);

(d) Sandbox Remote Pilot Authorisation application (CAR-AAM.SB.310);

(e) energy policy template (CAR-AAM.SB.330);

(f) dangerous goods policy statement (CAR-AAM.SB.325); and

(g) emergency exercise report (CAR-AAM.SB.315).

APPENDIX 5 – VERTIPORT AND LANDING SITE TOOLKIT

Status: minimum content (Subpart G). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) site assessment checklist (CAR-AAM.SB.350);

(b) vertiport operations manual contents (CAR-AAM.SB.355);

(c) charging infrastructure checklist (CAR-AAM.SB.352); and

(d) emergency plan template (CAR-AAM.SB.365).

APPENDIX 6 – ANS, UTM AND CNS TOOLKIT

Status: minimum content (Subpart H). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) model LOA and ICD template (CAR-AAM.SB.400);

(b) USSP designation application (CAR-AAM.SB.405(c));

(c) interim UTM arrangement statement (CAR-AAM.SB.405(g));

(d) C2 Link performance statement (CAR-AAM.SB.410); and

(e) aeronautical data submission form (CAR-AAM.SB.415).

APPENDIX 7 – DATA, DIGITAL SERVICES AND CYBERSECURITY TOOLKIT

Status: minimum content (Subpart I). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) data recording specification (CAR-AAM.SB.450);

(b) DSP register and criticality assessment (CAR-AAM.SB.455);

(c) cybersecurity evidence pack template (CAR-AAM.SB.460);

(d) cyber incident report form (CAR-AAM.SB.460);

(e) data protection impact assessment outline (CAR-AAM.SB.465); and

(f) cyber risk assessment methodology model, consistent with the national aviation security risk assessment methodology and the national cybersecurity guidance material (CAR-AAM.SB.200, CAR-AAM.SB.460).

APPENDIX 8 – ENVIRONMENTAL AND COMMUNITY TOOLKIT

Status: minimum content (Subpart J). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) environmental screening form (CAR-AAM.SB.500);

(b) noise data submission form (CAR-AAM.SB.505);

(c) community engagement plan (CAR-AAM.SB.510); and

(d) complaint log format (CAR-AAM.SB.505, CAR-AAM.SB.510).

APPENDIX 9 – ECONOMIC, INSURANCE AND CONSUMER TOOLKIT

Status: minimum content (Subpart K). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) business case summary (CAR-AAM.SB.550);

(b) insurance certificate format (CAR-AAM.SB.555);

(c) passenger information leaflet outline (CAR-AAM.SB.560); and

(d) complaints and refund policy checklist (CAR-AAM.SB.560).

APPENDIX 10 – MONITORING, CLOSE-OUT AND TRANSITION TOOLKIT

Status: minimum content (Subparts L and M). Recommended templates will be published by the AUTHORITY in accordance with CAR-AAM.SB.675(d).

(a) Performance Monitoring Plan (CAR-AAM.SB.600);

(b) periodic report template (CAR-AAM.SB.605);

(c) Close-Out Report structure (CAR-AAM.SB.610);

(d) Sandbox Conversion Annex template (CAR-AAM.SB.655); and

(e) wind-down plan template (CAR-AAM.SB.615).

APPENDIX 11 – MODEL SANDBOX APPROVAL

SULTANATE OF OMAN – CIVIL AVIATION AUTHORITY

AAM SANDBOX APPROVAL No. OM-AAM-SB-[YYYY]-[NNN]

Issued under CAR-AAM.SB.165. This approval is not an Air Operator Certificate and does not constitute a type certificate.

Item	Particulars
1. Sandbox Operator	[Legal name, commercial registration number, address]
2. Consortium members and roles	[Names and roles]
3. Accountable Manager	[Name]
4. Sandbox Project title and use case	[Title; cargo / passenger / public service / other]
5. Complexity Level	[L1 / L2 / L3]
6. AAM Aircraft	[Type; registration; airworthiness basis (TC / validated TC / Sandbox Flight Permit / SAIL-based design verification); Automation Level (AMC1 CAR-AAM.SB.280)]
7. Operating areas and Operational Volumes	[Reference to attached maps and coordinates; altitude limits]
8. Vertiports and landing sites	[Name; authorisation reference]
9. Airspace and service arrangements	[LOA and ICD references; USSP or interim UTM arrangement (SB.405(g)); C2 CSP; safety-critical DSPs; Programme Coordination Office and Shared OCC Facility, if any]
10. Specific approvals	Passengers [yes/no]; dangerous goods [yes/no, classes]; BVLOS [yes/no]; night [yes/no]; operations over congested areas [yes/no]
11. Stop Conditions	[List with thresholds, including any programme-level Stop Conditions under SB.127(c)]
12. Project-specific Notifiable and Major Changes	[List]
13. Exemptions granted	[CAR 10 references, or "None"]
14. Reporting and data access	[Periodic report frequency; data access arrangements]
15. Insurance	[Insurer; policy number; limits]
16. Validity	From [date] to [date], unless limited, suspended, revoked or surrendered earlier
17. Target CAR-AAM Category	[Category and instrument at transition (AMC1 CAR-AAM.SB.157)]
18. Regulatory Learning Plan questions addressed	[References to the Plan (CAR-AAM.SB.100(b)(11))]

Phases authorised

Phase	Scope and limitations	Entry criteria	Exit criteria	Status
0	[ ]	[ ]	[ ]	[Authorised / Pending]
1	[ ]	[ ]	[ ]	[ ]
2	[ ]	[ ]	[ ]	[ ]
3	[ ]	[ ]	[ ]	[ ]
4 (EIS)	[ ]	[ ]	[ ]	[ ]

Conditions: The Sandbox Operator shall comply with CAR-AAM.SB, its Operations Manual and all conditions stated in this approval. Any breach may lead to action under CAR-AAM.SB.185 and CAR 12.

Issued at Muscat on [date].

NameTitleSignature and stamp

Name	Title	Signature and stamp
[ ]	[Decision-Maker]	