International Civil Aviation Organization

MIDANPIRG/22 & RASG-MID/12 Meetings

(Doha, Qatar, 4 – 8 May 2025)

Agenda Item 4.2: Outcomes of the RASG-MID Groups (ASPIG Meeting)

OPERATIONAL ASPECTS GOVERNING VERTIPORT DESIGN AND AUTHORIZATION IN SAUDI ARABIA

(Presented by Saudi Arabia)

SUMMARY

This paper presents KSA guidance material for design specifications for vertiports, referencing the GACA Advisory Circular AC 140-01 Vertiports Design Specification (VDS) and GACA E-Book Volume 7 on Aerodromes, Heliports, and Vertiports. The paper outlines key GACA technical specifications, classification criteria, and authorization procedures aligned with available international guidance to support the safe and efficient operation of VTOL (Vertical Take-Off and Landing) aircraft.

Action by the meeting is at paragraph 3.

REFERENCES

- GACAR Part 138 Certification, Authorization and Operation of Heliports
- GACA E-Book Volume 7 – Aerodromes, Heliports, Vertiports, and Water Aerodromes Administration
- GACA Advisory Circular AC 140-01 (Vertiports Design Specification - VDS)
- ICAO Annex 14, Volume II – Heliports
- EASA Prototype Technical Specifications for Vertiports
- CASA AC 139.V-01v1.0 (Australia)

1. INTRODUCTION

1.1 The emergence of Advanced Air Mobility (AAM) and VTOL aircraft has necessitated the development of regulatory frameworks and design specifications for vertiports. In response, the General Authority of Civil Aviation (GACA) of Saudi Arabia has taken the initial step of formulating and issuing GACA eBook Volume 7, Chapter 17 (*Establishment of Vertiports*) and GACA Advisory Circular AC-140-01 (*Vertiports Design Specification*).

1.2 The General Authority of Civil Aviation (GACA) GACA oversees the construction and operation of vertiports in Saudi Arabia through the issuance of a GACA Vertiport Authorization, granted on a case-by-case basis. This evaluation process follows the guidelines set forth in GACA eBook Volume 7.

1.3 The General Authority of Civil Aviation (GACA) of Saudi Arabia actively participates in the ICAO Vertical Flight Infrastructure Working Group, where it raises concerns and contributes to discussions on vertiport design.

1.4 This working paper outlines the technical and operational aspects governing vertiport design and authorization in Saudi Arabia, ensuring alignment with international standards and best practices.

2. DISCUSSION

GACA Advisory Circular AC 140-01 (Vertiports Design Specification - VDS)

2.1 The structure of the promulgated Advisory Circular is aligned with the minimum requirements mentioned in refences above, and comprises the following:

- **Part 1** General (Introduction; Purpose; Additional References; Definitions; Abbreviations/Symbols)
- **Part 2** Technical Specification (Physical Characteristics; Final Approach and Take-Off (FATO); Touch Down and Lift-Off (TLOF); Safety Area; Protected Area; Visual Aids; Vertiport Marking; Wind Direction Indicator; Vertiport Beacon; Vertiport Lighting; Obstacle Limitation Surfaces; Approach Surface; Transitional Surface; Obstacle Limitations)
- **Part 3** Rescue and Fire Fighting (Vertiport Emergency Plan; Rescue and Fire Fighting Services (RFFS); Hazard Area)
- **Part 4** Contact Information

This Advisory Circular serves as an initial step in developing guidance material for the industry on the fundamental requirements for establishing vertiports. It will remain in effect until more regulations are promulgated among States, along with ICAO SARPs.

GACA E-BOOK VOLUME 7, Chapter 17

2.2 The General Authority of Civil Aviation (GACA) of Saudi Arabia has promulgated E-Book series to serve as Aerodrome safety Inspectors guidance material and also, provides the required information to all regulated entities under the GACA Aviation Safety.

2.5 The Vertiport Establishment and Operation Authorization Process by GACA Safety Inspectors consist of the following generic phases:

- Pre-Application
- Formal Application
- Document Compliance
- Demonstration and Inspection
- Authorization Phase

Air Taxi Proof of Concept (POC) – Hajj Season

2.6 A demonstration flight using an air taxi was conducted on a military helipad, not a purpose-built vertiport. The trial provided limited insight into vertiport-specific infrastructure needs, as the environment did not reflect actual vertiport conditions. GACA Aerodrome Safety Department identified two operational concerns:

- Thermal control during battery charging needs to be addressed;
- Conventional fire suppression systems are not suitable for Li-ion battery fires, highlighting a gap in emergency response readiness for vertiports.

These findings are critical for future vertiport design and safety planning.

Advanced Air Mobility (AAM) Roadmap and Infrastructure Ownership

2.7 The KSA National Advanced Air Mobility (AAM) Roadmap positions strategic infrastructures as key enablers of AAM deployment. The implementation is decentralized at local authorities and giga-projects, including:

- NEOM
- Red Sea Global
- Riyadh Commission for Riyadh City (RCRC)
- Riyadh Municipality (أمانة الرياض)

These entities are responsible for identifying and planning potential vertiport sites. A National multi-stakeholder strategic governance model is emerging in KSA, to develop and implement the AAM, including but not limited to: GACA, SANS, and Security/Military agencies. This collaborative governance structure is proposed as a model for vertiport planning and oversight, particularly in urban areas such as Riyadh.

NEOM Air Taxi Experimentation

2.8 GACA's Aerodrome Safety Department facilitated the NEOM Air Taxi trial project by issuing a temporary authorization to use an existing helipad. This pragmatic approach allowed for initial testing without full vertiport infrastructure, providing practical insights into early-stage AAM operations.

2.9 Despite ongoing efforts to promote and disseminate guidance on vertiports, challenges persist globally in the establishment and authorization of these facilities. The Kingdom of Saudi Arabia (KSA) seeks support on how to address some of these challenges in Section 3.1 of this Working Paper (WP).

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) Review and evaluate the adoption of GACA AC 140-01 as a reference model for vertiport design and authorization;

b) Foster regional collaboration among States to standardize Advanced Air Mobility (AAM) infrastructures;

c) Support the development of safety frameworks for thermal control during battery charging and Rescue, Fire Fighting Services (RFFS) and Emergency Planning at vertiports;

d) Advocate for the establishment of standards for assessing Obstacle Limitation Surfaces (OLS) at vertiports.

e) The effects of VTOLs downwash during take-off and landing.

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