



## FOURTEENTH AIR NAVIGATION CONFERENCE

Montréal, Canada, 26 August to 6 September 2024

- Agenda Item 2: Timely and safe use of new technologies**  
**2.1: Evolving aircraft technologies contributing to LTAG**

### HYBRID OPERATIONS ON HELIPORTS AND VERTIPOINTS

(Presented by the United Arab Emirates)

#### EXECUTIVE SUMMARY

The United Arab Emirates is advancing its aviation sector by establishing provisions for hybrid operations, allowing electrical Vertical Take-off and Landing aircraft (eVTOLs) to use heliports and helicopters to use vertiports. This initiative aligns with the United Arab Emirates' ongoing efforts to enhance national regulations on vertiports. Utilizing the 123 certified heliports across the country, this approach leverages existing infrastructure, resulting in significant cost savings and improved operational efficiency. Collaborative efforts among stakeholders are crucial to addressing the technical and regulatory challenges, ensuring the successful and sustainable integration of these advanced air mobility solutions.

**Action:** The Conference is invited to:

- note the content of this working paper;
- request ICAO to take advantage of provisions developed by the United Arab Emirates that support hybrid operations on heliports and vertiports;
- request ICAO to initiate the development of a common set of guidance material on hybrid operations on heliports and vertiports; and
- recommend that ICAO coordinates the development of guidance material with relevant industry stakeholders.

## 1. INTRODUCTION

1.1 The United Arab Emirates has been at the forefront of aviation innovation, demonstrating a commitment to integrating advanced technologies into its transportation infrastructure. In line with this vision, the United Arab Emirates General Civil Aviation Authority (GCAA) is making significant strides in establishing provisions for hybrid operations, which would allow electrical Vertical Take-off and Landing aircraft (eVTOL) aircraft to operate on heliports and conventional helicopters to use vertiports. This initiative aligns seamlessly with the United Arab Emirates' broader efforts to enhance and evolve the first national regulation published on vertiports, Civil Aviation Regulation – Heliports, Vertiports, and Helidecks.

1.2 Accommodating hybrid operations brings substantial benefits, primarily in terms of cost savings and operational efficiency. By enabling eVTOLs to utilize existing heliports and vice versa, the United Arab Emirates can leverage its current infrastructure, thereby reducing the need for extensive new construction and minimizing associated expenditures. This approach not only cuts costs but also accelerates the deployment of next-generation air mobility solutions. Additionally, operational efficiency is significantly improved as it allows for more flexible and dynamic use of airspace and ground facilities, optimizing the utilization of resources and enhancing overall service delivery.

1.3 With 123 certified heliports already scattered across the United Arab Emirates, the decision to repurpose and integrate these facilities for hybrid operations is both practical and economically advantageous. This extensive network of heliports provides a robust foundation upon which the new eVTOL infrastructure can be built, ensuring a smooth and cost-effective transition to hybrid operations.

1.4 This working paper presents insights of the United Arab Emirates GCAA initiatives to establish provisions for hybrid operations on heliports and vertiports.

## 2. DISCUSSION

2.1 In 2022, the United Arab Emirates GCAA carried out an applicability assessment, initial impact assessment and a gap analysis against ICAO Annex 14 — *Aerodromes*, Volume II — Heliports, the Federal Aviation Administration (FAA) Engineering Brief No. 105 Vertiport Design and the European Union Aviation Safety Agency (EASA) PTS-VPT-DSN, and drafted the first national regulation in the world on Vertiports.

2.2 In 2023, the United Arab Emirates GCAA has developed and published a robust regulatory framework for the certification and oversight of vertiports.

2.3 In 2024, the United Arab Emirates GCAA is exploring the feasibility of hybrid operations on heliports and vertiports for the following anticipated benefits on the civil aviation sector in the United Arab Emirates:

### ***Increased operational flexibility:***

2.3.1 Hybrid facilities allow for the accommodation of both eVTOLs and traditional helicopters in the same location. This flexibility is crucial for adapting to varying mission requirements, such as emergency medical services, corporate transport, tourism, and more.

### ***Optimized use of infrastructure:***

2.3.2 By integrating both vertiports and heliports, existing infrastructure can be utilized more efficiently. Facilities like landing areas, terminals and support services (e.g., fuelling, maintenance) can serve multiple types of aircraft, reducing the need for separate facilities and associated costs.

### ***Enhanced accessibility:***

2.3.3 Hybrid operations improve accessibility for various types of aircraft operations in urban and remote areas. This accessibility supports enhanced connectivity and transport options for passengers, goods, and emergency services.

***Improved safety and regulatory compliance:***

2.3.4 Consolidating regulatory oversight and operational standards for both vertiports and heliports ensures consistent safety measures and regulatory compliance. This approach helps mitigate risks and ensures operations meet national and international aviation standards.

***Environmental benefits:***

2.3.5 Optimizing infrastructure for hybrid operations can contribute to environmental sustainability. Reduced emissions from electric aircraft and efficient use of infrastructure contribute to lower carbon footprints compared to traditional helicopter operations.

***Promotion of innovation and investment:***

2.3.6 Hybrid operations attract investment and foster innovation in aviation technology and infrastructure. By supporting diverse aviation needs in a single location, these facilities encourage the development of new aircraft technologies and operational concepts.

2.3.7 Overall, integrating vertiports and heliports into hybrid operations offers a strategic approach to advancing aviation capabilities, enhancing connectivity, and supporting sustainable urban and regional development goals. These benefits collectively contribute to a more efficient and resilient aviation ecosystem.

2.4 The following technical aspects are being considered as a part of the development process for hybrid operation:

- a) *physical characteristics*: The need for adequate space to accommodate both helicopters and eVTOLs, ensuring structural integrity to support the diverse weight and landing dynamics of different aircraft types, and providing suitable infrastructure for refueling and recharging;
- b) *visual aids*: The need to physically denote an infrastructure as suitable for hybrid operations;
- c) *obstacle limitation surfaces (OLS)*: Consideration on how the obstacle free volume will accommodate helicopter operations on vertiports and the utilization of heliport tradition OLS for vertical take-off and landing (VTOL) capable aircraft;
- d) *rescue and firefighting services*: The need for specialized training and equipment to handle both types of aircrafts. The integration of electric and hybrid propulsion systems in eVTOLs introduces new risks such as battery fires and high-voltage hazards. Ensuring adequate infrastructure, including water supply and firefighting foam systems, and maintaining clear communication channels are crucial to effectively manage emergencies and minimize risks to passengers and crew;
- e) *emergency response plan*: Adapting firefighting and rescue protocols for different fuel sources and structural designs, and coordinating with multiple agencies. Responders must be trained in handling new technologies and navigating urban environments where vertiports are often located, ensuring rapid and efficient access to accident sites.

- f) *operational requirements*: Infrastructure adaptation including charging or fueling facilities and robust air traffic management systems to handle increased and varied traffic;
- g) *training requirements*: Understanding the distinct operational procedures, safety protocols and regulatory requirements for both ports. Training should cover the specifics of managing mixed traffic involving helicopters and eVTOLs.
- h) *airspace assessment*: Managing potential air traffic congestion, coordinating flight paths, addressing the varying performance characteristics and operational requirements of different aircraft.

### 3. CONCLUSION

3.1 In conclusion, the United Arab Emirates GCAA is pioneering the future of advanced air mobility by integrating hybrid operations for electric for eVTOL aircraft and conventional helicopters. By leveraging the existing network of heliports and establishing a robust regulatory framework, the United Arab Emirates aims to enhance operational efficiency, reduce costs and promote environmental sustainability. This strategic initiative not only fosters innovation and investment in aviation technology but also ensures improved safety and regulatory compliance. The United Arab Emirates' comprehensive approach, encompassing infrastructure adaptation, regulatory oversight and specialized training, positions it as a leader in the global aviation sector, driving advancements that support urban and regional development goals.

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