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TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

ADVANCED AIR MOBILITY IN INDIA: CURRENT POSITION AND DEVELOPMENTS

(Presented by India)

EXECUTIVE SUMMARY

India is rapidly advancing the integration of drones and Advanced Air Mobility (AAM) to address transport and logistics needs arising from urbanization and economic growth. The Drone Rules 2021 introduced a tiered classification system and mandated remote pilot certification for commercial operations. Recent regulatory advancements include ADAC 01 and AEAC 01 of 2024, defining certification standards for vertiports and eVTOL-capable aircraft (VCAs). Strategic initiatives such as the “Skyways to the Future” report (Shillong, November 2024) and Urban Air Mobility Expo 2025 (Greater Noida) showcase roadmap development and industry momentum. India’s efforts align closely with ICAO principles, reinforcing its commitment to safe, efficient, and sustainable aviation modernization.

Implementation challenges persist, notably in harmonizing regulations with global standards, expanding domestic manufacturing, and developing low-altitude infrastructure. Proposed strategies include operationalizing a Unified Traffic Management (UTM) system integrated with the Digital Sky Platform, establishing AAM corridors, and creating Centers of Excellence at IITs and IISc. Coordination with state authorities for multimodal vertiport construction and policy benchmarking against FAA and EASA frameworks are pivotal next steps. Sandbox deployments will further validate operational readiness. The integration of drones and VCAs into conventional airspace requires regulatory frameworks, infrastructure and public trust to ensure safety. India’s comprehensive approach aligns with ICAO to create a safe, efficient and sustainable AAM ecosystem. By addressing these challenges, India aims to revolutionize urban transport

<i>Strategic Goals:</i>	This paper relates to <i>Every Flight is Safe and Secure</i> and <i>Aviation Delivers Seamless, Accessible, and Reliable Mobility for All</i> .
<i>Financial implications:</i>	NIL

<i>References:</i>	The Aircraft Rules, 1937 The Drone Rules 2021 The UTM policy- India DGCA India Aerodrome Advisory Circular 01 of 2024 [Vertiports] DGCA India Aircraft Engineering Advisory Circular 01 of 2024 [VCA certification] DGCA India Flight Crew Licencing 01 of 2025 CAR-21
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1. INTRODUCTION

1.1 India, a founding contracting State of ICAO and the world's third-largest domestic aviation market, is experiencing rapid urbanization and economic growth, requiring innovative transportation and logistics solutions. Drones have already demonstrated utility in applications such as medical deliveries in mountainous regions and agricultural services. Advanced Air Mobility (AAM) is now emerging as a transformative solution for urban, regional, and short-haul mobility. Key initiatives include:

- a) *The Drone Rules 2021*: Establishes weight-based classifications (Nano to Large) and mandates Registration and Remote Pilot Certification for commercial usage;
- b) *AD AC 01 of 2024*: Guidance Material for Design, Operation and Authorization of Vertiports;
- c) *AEAC 01 of 2024* : Guidance Material on Type Certification of vertical take-off and landing capable aircraft (VCA);
- d) *“Skyways to the Future: Operational Concepts for Advanced Air Mobility in India”* (Shillong, Nov 2024): Offers strategic guidance for short-haul transport via AAM, emphasizing vertiports and airspace management needs;
- e) *Urban Air Mobility Expo 2025 (Greater Noida, Jan 2025)*: Focused on ecosystem development and demonstrated operational capabilities of drones and VCAs; and
- f) *FCL 01 of 2025*: Guidance material for training and endorsement of VTOL capable aircraft (VCA) rating.

1.2 India’s demographic scale and geographical diversity position it to derive global value from Drone and AAM technologies, especially in logistics, disaster response, and urban mobility. India is capitalizing drones and Advanced Air Mobility (AAM) to address transportation challenges, given its status as the third-largest domestic air traffic market. However, challenges persist;

- a) *Regulatory Gaps*: While we have made progress with the Drone Rules 2021 and the Unmanned Aircraft System (UAS) Traffic Management (UTM) policy, the regulatory framework lacks comprehensive standards for Drone, AAM operations, including Vertiport integration into existing Aerodrome network across the country and in other parts of the world;

- b) *Infrastructure Deficits*: The absence of infrastructure at present such as Vertiports, Charging/ battery swapping facilities, VCA manufacturing facilities, has potential limitation on scalability of drone and VCA operations;
- c) *Airspace Management*: High-density conventional traffic necessitates future ready robust ATM integration to accommodate new technology that may or may not be compatible with legacy system;
- d) *Public Acceptance*: Noise concerns and low awareness affect deployment, especially in rural settings. India recognizes that sustained public engagement is vital— frequent and visible demonstrations of aviation innovation are essential to nurturing long-term interest and fostering broader acceptance; and
- e) *Technological and Economic Hurdles*: High costs for testing, certification and domestic manufacturing inhibit affordability and scale.

2. DISCUSSION

2.1 Drone Directorate in DGCA has been tasked to function as a nodal directorate for Advanced Air Mobility operations in India. DGCA has constituted six working groups to develop requirements and guidance for advanced air mobility. These working groups are focusing on various aspects such as:

- a) Vertiports;
- b) Type Certification of vertical take-off and landing capable aircraft (VCA);
- c) crew licensing;
- d) air operator permits;
- e) UAS traffic management (UTM); and
- f) maintenance, repair, and overhaul (MRO).

2.2 So far, following circulars/guidance materials have been issued are available on DGCA website <https://www.dgca.gov.in> / under “Regulation & Guidance” Tab for public:

- a) ADAC 01 of 2024: Guidance material on ‘Design, Operation and Authorization of Vertiports issued on 5 September 2024;
- b) AEAC 01 of 2024: Guidance material on Type Certification of Vertical Take-off and Landing capable aircraft (VCA) issued on 11 September 2024; and
- c) FCL 01 of 2025: Guidance material for training and endorsement of VTOL capable aircraft (VCA) rating issued on 30 April 2025.

2.3 Identified sandbox sites in the State of Gujarat and State of Andhra Pradesh to validate operational models.

2.4 India intends to leverage the regulatory provisions outlined in the Drone Rules, 2021 and the Aircraft Rules, 1937 to facilitate sandbox trials. These trials will encompass operations involving both unmanned/remotely piloted aircraft and piloted platforms, with phased expansion aligned to evolving levels of operational confidence.

2.5 Two organisations have demonstrated their capability to be design organisation under CAR-21 and have obtained Design Organisation Approval from DGCA.

2.6 India's proposed strategy to support the growth of Advanced Air Mobility (AAM) will include designating dedicated corridors for Vertical Capability Aircraft (VCAs) to segregate them from conventional air traffic, conducting specialized training sessions for the Air Traffic Management (ATM) community to build operational capacity in conventional airspace, and prioritizing dynamic airspace allocation to enable rapid response capabilities. In parallel, coordination with State Governments will be undertaken to build, operate, and integrate a national Vertiports network with multimodal transport hubs. Centres of Excellence will be established to promote innovation and research, while stakeholder engagement efforts will include targeted awareness campaigns. To further strengthen domestic capabilities, India will also incentivize indigenous VCA manufacturing through Production Linked Incentive (PLI) schemes.

3. CONCLUSION

3.1 In light of the substantial progress and strategic initiatives undertaken by India, the assembly is invited to acknowledge the country's concerted efforts to position itself as a global leader in Drone and Advanced Air Mobility (AAM) integration. From establishing foundational regulatory frameworks and guidance materials to operationalizing sandbox trials and laying the groundwork for national Vertiport infrastructure, India is building a scalable and future-ready AAM ecosystem. While challenges remain—particularly in public acceptance, infrastructure readiness, and regulatory harmonization—the proactive approach adopted by India underscores its commitment to innovation, inclusivity, and international collaboration.

3.2 The assembly may take note of these developments and consider fostering regional and global synergies to support the safe, equitable, and sustainable advancement of AAM technologies.

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