International Civil Aviation Organization

Thirty-Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/35)

Bangkok, Thailand, 25 to 27 November 2024

Agenda Item 3: **Performance Framework for Regional Air Navigation Planning and Implementation**

3.6: **Other Air Navigation Matters**

HARMONIZING GLOBAL STANDARDS FOR THE INTEGRATION OF UNMANNED AIRCRAFT AND ITS NEW ENTRANTS INTO AIRSPACE OPERATIONS

(Presented by Indonesia)

SUMMARY

This paper describes the need for unified global standards for the integration of unmanned aircraft and its new entrants into airspace operations by recognizing that the rapid advancement of Unmanned Aircraft Systems (UAS), including Advanced Air Mobility (AAM) and drone delivery technologies, offers transformative opportunities for transportation and logistics. These innovations promise to reduce congestion, lower emissions, and revolutionize urban mobility. However, their integration into existing airspace presents challenges such as regulatory gaps, safety concerns, infrastructure needs, public acceptance, and environmental impacts.

Strategic Objectives:

A*:* ***Safety*** *– Enhance global civil aviation safety*

B: ***Air Navigation Capacity and Efficiency*** *— Increase the capacity and improve the efficiency of the global aviation system*

1. INTRODUCTION

1.1 The rapid advancement in technology and the growing demand for efficient and sustainable transportation solutions have paved the way for the development of Unmanned Aircraft. The innovation of Advanced Air Mobility (AAM) and delivery drones promise to revolutionize the way people and goods are transported, with the potential to alleviate congestion, reduce emissions, and open up new possibilities for urban mobility and logistics.

1.2 However, while the opportunities are vast, the integration of AAM and drones and others its new entrants into existing airspace and urban environments presents significant challenges. These challenges include regulatory and safety concerns, infrastructure requirements, airspace management, public acceptance, and environmental impacts. To address these, there is an urgent need for comprehensive guidance and a collaborative approach among all stakeholders, including aviation authorities, governments and industries.

2. DISCUSSION

2.1 In 2019, the ICAO Asia Pacific (APAC) Office introduced the Asia/Pacific Regional Guidance for the Regulation and Safe Operation of Unmanned Aircraft Systems (UAS) within National Airspace. This document was developed to support member states in addressing the growing demand for unmanned aircraft operations and ensuring their safe and efficient integration into national airspace systems.

2.2 This regional guidance represented a proactive effort by ICAO Asia Pacific to assist states in harmonizing their approaches to UAS regulation, promoting safety, and fostering innovation in unmanned aviation across the Asia-Pacific region. It also served as a foundation for the development of national frameworks in line with evolving technological and operational trends. As the concrete measure, Indonesia transposed its provision into our national regulation concerning the Unmanned Aircraft Operation in Indonesia.

2.3 As described on the introduction, that the rapid innovation has significantly expanded their utilization, ranging from commercial deliveries and disaster response to urban air mobility and environmental monitoring. While these advancements present transformative opportunities, they also introduce new complexities and challenges that must be addressed to ensure the safety, efficiency, and regularity of airspace operations.

2.4 Some considerations and key factors that has been identified to facing the innovations are:

a. **Regulatory Frameworks**
A clear and unified regulatory framework is necessary to establish safety standards, certification processes, and operational rules. This includes drone operator qualifications, aircraft certification, flight permissions, and liability protocols. States must harmonize their regulations to prevent fragmentation and promote international interoperability.

b. **Safety and Airspace Management**
The unmanned aircraft operations in both controlled and uncontrolled airspace, coordination between various air traffic management systems and operators is essential. Airspace deconfliction, collision avoidance, and safe integration with traditional aviation systems are crucial for mitigating risks.

c. **Infrastructure Development**
The physical infrastructure for these innovations needs to be developed in urban and suburban environments. This includes vertiports (for vertical takeoff and landing), landing pads, charging stations, and drone control centers. Furthermore, infrastructure must be scalable to accommodate growing demand.

d. **Public Acceptance and Privacy Concern**
Public trust is essential for their widespread adoption of the innovation. Transparency in operations, stringent safety measures, noise reduction strategies, and measures to protect privacy will help alleviate concerns among the public.

e. **Environmental Considerations**
The use of AAM and drones hold the potential for reducing emissions, but their environmental impact must be continuously monitored. The use of electric propulsion systems, noise reduction technologies, and sustainable manufacturing practices should be prioritized.

2.5 Several international conferences and workshops have provided valuable insights into the guidance needed for AAM and drone integration. And as the outcomes of the most recent Air Navigation Conference (AN-CONF/14, 26 August – 6 September 2024) in the *recommendation 2.2/1 – Addressing safety risks related to new and evolving aviation technologies and concepts* included four suggestions for States and five for ICAO. Inter alia, *ICAO, along with States and industry, identify how to better engage with aviation innovators in order to benefit from a wider range of experience and expertise in addressing the safe introduction of new and evolving aviation technologies and concepts,* and *develop guidance to support States in identifying hazards and managing safety risks related to emerging issues in order to safely implement advanced air mobility, including electric vertical take-off and landing operations.*

2.6 In recent years, several countries and industries have been actively involved in the trial and testing of AAM and delivery drone technologies. These trials aim to test the viability of urban air mobility solutions, package delivery, and Beyond Visual Line of Sight (BVLOS) operations. Notable activities include to focus on aspects such as airspace integration, air traffic management (procedure and communication), passenger safety, urban infrastructure integration, battery life, payload capacity, and others operational safety.

2.7 From 2019 to 2024, Indonesia has conducted various trial activities focusing on the utilization of Advanced Air Mobility (AAM) and drone delivery systems. These trials have been instrumental in exploring the potential of these emerging technologies within the national airspace.

2.8 The activities also highlighted several challenges, particularly in the coordination between stakeholders. A key factor contributing to these challenges was the absence of comprehensive guidance to govern and standardize these innovative operations.

2.9 The lack of detailed regulations and harmonized frameworks created inconsistencies in roles, responsibilities, and expectations among the involved entities. This often led to operational delays, miscommunication, and difficulties in aligning safety protocols and technical requirements. These challenges underscore the urgent need for a regional comprehensive and inclusive regulatory framework.

3. ACTION BY THE MEETING

3.1 The Meeting is invited to:

a) Note the information contained in the paper;

b) Encourage States to support ICAO’s efforts in developing comprehensive guidance to harmonize the innovative operations of new and evolving aviation technologies, inter alia, for Advanced Air Mobility and drone delivery operations;

c) Encourage member states and international organization to share their experience as the best practices and lesson learnt of the utilization of the new and evolving aviation technologies; and

d) Discuss any relevant matters as appropriate.

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