



ASSEMBLY — 42ND SESSION

TECHNICAL COMMISSION

Agenda Item 24: Aviation Safety and Air Navigation Priority Initiatives

A STRATEGIC FRAMEWORK FOR HIGHER AIRSPACE OPERATIONS (HAO)

(Presented by Saudi Arabia)

EXECUTIVE SUMMARY

Higher airspace operations (HAO) are rapidly transitioning from concepts to commercial realities, encompassing activities such as near-space tourism, high-altitude platform systems, and suborbital transport. This evolution, recognized in Assembly Resolution A41-9: New Entrants, presents significant opportunities for global connectivity and economic growth but also introduces major and complex challenges to the existing air navigation system. The Fourteenth Air Navigation Conference (AN-Conf/14) reached a clear consensus on the need for a reprioritized and structured approach for HAO. AN-Conf/14, Recommendation 3.1/7 — Higher airspace operations explicitly calls on ICAO to develop a holistic vision and global concept for HAO, including provisions for safe transit, separation management, and risk assessment. This reflects a global understanding that a fragmented, State-by-State regulatory approach would inhibit growth and compromise safety.

Considering Assembly Resolution A41-9, this paper summarizes the outcomes of AN-Conf/14 and refers to the practical implementation needs as highlighted by States undertaking initial HAO activities. It proposes a pragmatic, phased approach, starting with the development of internationally agreed guidelines before progressing to formal Standards and Recommended Practices (SARPs). To implement this approach, the paper recommends the establishment of a dedicated, multidisciplinary HAO working group. This Group would be charged with drafting the initial framework *for higher airspace operations*. To ensure broad stakeholder buy-in and gather comprehensive input, it is proposed to initiate the HAO work through a global ICAO symposium.

<i>Strategic Goals:</i>	This working paper relates to the Strategic Goals: <i>Every Flight is Safe and Secure</i> .
<i>Financial implications:</i>	Allocation of resources from the 2026-2028 budget will be required for ICAO to undertake the development of the requested guidance material. Activities may be supported by voluntary financial contributions and secondments from Member States.
<i>References:</i>	Doc 10184, <i>Assembly Resolutions in Force (as of 7 October 2022)</i> Doc 10209, <i>Report of the Fourteenth Air Navigation Conference</i> AN-Conf/14-WP/131, higher airspace operations (HAO) (Presented by Saudi Arabia)

1. INTRODUCTION

1.1 The stratosphere and higher airspace are no longer the exclusive domain of state-led scientific research. A new era of exploration and commercial utilization is underway, driven by innovations

in near-space tourism, high-altitude platform systems (HAPS) for telecommunications, and development of suborbital point-to-point transport. These activities represent new opportunities for aviation, with the potential to generate significant economic and societal benefits.

1.2 Recognizing this evolution, the 41st Session of the Assembly adopted Resolution A41-9: New Entrants, which “directs ICAO to review Standards and Recommended Practices (SARPs)... and to develop specific concepts and guidance to facilitate the operation of New Entrants within a global, harmonized framework, ...” This resolution provides a clear mandate for ICAO to lead the development of a regulatory structure for HAO, ensuring these new operations do not pose undue risk to conventional air traffic and can be integrated in a safe and orderly manner.

1.3 The Fourteenth Air Navigation Conference (AN-Conf/14) discussed HAO operations and Member States and international organizations reaffirmed the need and urgency of addressing HAO. The Conference outcomes, particularly its specific recommendations on HAO, provide a clear and consensual path forward. This working paper reviews the clauses of the Assembly Resolution A41-9 and the recommendations of AN-Conf/14, proposing concrete steps to guide ICAO’s work on HAO in the upcoming triennium.

2. DISCUSSION

2.1 The AN-Conf/14 outcome on HAO

2.1.1 The discussions at AN-Conf/14 marked a turning point for HAO, moving from general acknowledgement to specific action and set a global consensus. Recommendation 3.1/7 — Higher airspace operations encapsulate this consensus, calling on ICAO to:

- a) develop a holistic vision and global concept for higher airspace operations, including regulatory approval, coordination responsibilities and liability, for inclusion in its work programme for the next triennium; and
- b) develop, in coordination with international organizations concerned, provisions related to the safe and efficient transit of aircraft through controlled airspace and separation management in higher airspace, including air traffic management procedures, contingency planning and risk assessment, and monitoring methodologies, including for uncontrolled descents of higher airspace operations vehicles.

2.1.2 This recommendation underscores the need for a comprehensive, top-down approach that addresses not only technical air traffic management procedures but also the overarching legal and institutional frameworks.

2.1.3 The need for a robust framework is no longer theoretical. As presented by the Saudi Arabia in AN-Conf/14-WP/131, States are already working to authorize commercial HAO activities, such as the planned near-space tourism flights by Halo Space. These operations highlight the need for practical guidance on:

- a) dynamic reservation of airspace volumes for ascent and descent phases;
- b) procedures for real-time flight tracking and monitoring;
- c) coordination protocols between HAO operators, air navigation service providers (ANSPs), and space agencies; and

- d) contingency planning for abnormal events.

2.1.4 Without a globally harmonized approach, States will develop disparate national regulations, creating various requirements that may hinder innovation, cross-border operations, and introduce unnecessary complexity and risks.

2.2 Use of pragmatic and phased approach: Guidelines as a first step

2.2.1 Developing comprehensive SARPs for the diverse range of HAO vehicles and missions is a complex, long-term undertaking. A pragmatic and effective initial step is the development of non-binding global guidelines and best practices. This approach allows for:

- a) flexibility: Accommodating the rapid evolution of technology without being constrained by the formal amendment process for SARPs;
- b) speed: Providing States and operators with essential guidance on time;
- c) harmonization: Establishing a common foundation for national legislations and promoting international cooperation from the outset; and
- d) sustainability: Providing legal and operational security to States, operators, and agencies, thereby encouraging investment and development.

2.2.2 These guidelines would serve as the essential precursor to a more robust and comprehensive HAO regulatory framework, developed as the operations mature.

2.2.3 To effectively develop these foundation guidelines, a dedicated body or working group is required. It is therefore proposed that ICAO establish a high-level, multidisciplinary HAO working Group. This group should include experts from air navigation, aircraft certification, personnel licensing, aviation law, and space operations, ensuring a holistic perspective.

2.2.4 To launch the HAO activities and ensure its outputs are aligned with the needs of the entire global community, it is recommended that ICAO convene a first symposium on higher airspace operations. This forum would bring together aeronautical authorities, space agencies, regional and international organizations, and key industry stakeholders. The symposium would serve to build consensus, gather critical input, and formally establish the mandate and work plan for the ICAO working group, ensuring a transparent and collaborative start to this vital work.

2.2.5 The development of an HAO framework cannot be accomplished by ICAO in isolation. As noted at AN-Conf/14, close coordination with the United Nations Office for Outer Space Affairs (UNOOSA) and other relevant bodies is essential. Furthermore, the success of the HAO working group will depend on the active support of Member States. As called for in AN-Conf/14-WP/131, States with emerging experience in this domain are strongly encouraged to support the ICAO work programme through the secondment of subject matter experts (SMEs) and the sharing of lessons learned.

3. CONCLUSION

3.1 The rapid development of HAO presents a pivotal moment for international civil aviation. The clear consensus from AN-Conf/14 provides ICAO with both direction and the impetus to act.

3.2 The absence of a globally harmonized framework will result in a fragmented regulation, inhibit growth, and may compromise the safety of HAO operations. The proposed strategic framework centered on a pragmatic, phased approach that starts with the development of expert-led guidelines, offering the most effective path to integrating these new entrants safely and sustainably.

3.3 By establishing a dedicated HAO working group and launching its work with a global symposium, ICAO can harness the available expertise of the global community. Therefore, the Assembly is invited to endorse the proposed actions, ensuring that ICAO remains at the forefront of shaping the future of aviation in all its dimensions.

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