



International Civil Aviation Organization

MIDANPIRG/21 and RASG-MID/11 Meetings

(Abu Dhabi, UAE, 4-8 March 2024)

Agenda Item 5.3: ANS (AIM, PBN, AGA-AOP, ATM-SAR, CNS and MET

LOW-LEVEL AND HIGHER AIRSPACE OPERATIONS

(Presented by Saudi Arabia)

SUMMARY

The Assembly Resolution A41-9 directs ICAO to review Standards and Recommended Practices (SARPs) relating to, inter alia, the rules of the air, air traffic services, certification, licensing, liability and the environment, for amendment or expansion as necessary, and to develop specific concepts and guidance to facilitate the operation of New Entrants within a global, harmonized framework, taking into account regional frameworks and practices. This Resolution defines the term “New Entrants” as higher airspace operations (HAO) and unmanned aircraft system (UAS) traffic management (UTM) operations.

The Higher Airspace Operations (HAO) are growing and may pose safety risks when transiting through the current ATM operations in the airspace below the HA (i.e., below FL 550 or FL660). This paper proposes to invite the MID RPAS/UTM ACTION GROUP to progress its activities and develop necessary guidance to States related to Unmanned Traffic Management (UTM).

Action by the meeting is under paragraph 4 of this WP.

<i>Reference(s)</i>	A41-9: New Entrants ICAO Doc 9750, Global Air Navigation Plan, 7th Edition MIDANPIRG/18 & RASG-MID/8-REPORT (PIRG/RASG MID DECISION 1: RPAS/UTM ACTION GROUP)
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1. INTRODUCTION

1.1 The Assembly Resolution A41-9 directs ICAO to review Standards and Recommended Practices (SARPs) relating to, inter alia, the rules of the air, air traffic services, certification, licensing, liability and the environment, for amendment or expansion as necessary, and to develop specific concepts and guidance to facilitate the operation of New Entrants within a global, harmonized framework, taking into account regional frameworks and practices. This Resolution defines the term “New Entrants” as higher airspace operations (HAO) and unmanned aircraft system (UAS) traffic management (UTM) operations.

1.2 As part of the ICAO work program on new entrants, ICAO issued the global UTM framework Edition 4¹ which is providing guidance to States on core capabilities of a “typical” UTM system that must be able to interact with the air traffic management (ATM) system in the short term and integrate with the ATM system in the long term. The core capabilities cover registration and identification systems; communications systems, detect and avoid (DAA) capabilities; geofencing-like systems; interoperability (with other systems and other States); UTM-ATM boundaries and information exchange; infrastructure performance requirements (including reliance on existing infrastructure); frequency spectrum (availability, suitability, security, etc.), cybersecurity considerations, structure and approval processes for UTM service providers, UTM risk assessment, separation, strategic deconflict, and contingency procedures...etc. It is expected that ICAO global UTM framework will be extended to include requirements on certification, integration into aerodromes, and emerging advanced air mobility (AAM) traffic in the low altitude environment.

¹ The Edition 4 of the UTM Framework is available on the ICAO Unmanned Aviation public website <https://www.icao.int/safety/UA/Documents/UTM%20Framework%20Edition%204.pdf>

1.3 Moreover, the ICAO Secretariat established the Advanced Air Mobility Study Group in light of rapid technological advances of new entrants and the potential impact on the aviation ecosystem. The AAM SG assists the Secretariat in developing a holistic vision and framework regarding AAM. This is done in a coordinated manner with other ICAO expert groups, as appropriate, with the aim to support a safe, secure, efficient and environmentally sustainable integration of AAM operations, and to facilitate the development of the AAM ecosystem. Furthermore, the AAM SG advises on all AAM-related work to be done by ICAO.

1.4 Recognizing the rapid pace of UA operations and demand on low altitude operations and airspace usage, MIDANPIRG/18 adopted PIRG/RASG MID DECISION 1: RPAS/UTM ACTION GROUP tasked to strengthen the collaboration between States and stakeholders for an orderly growth of unmanned air traffic; and to provide necessary guidance to States related to Unmanned Traffic Management (UTM). However, this Action Group was not active since its establishment.

1.5 With respect to higher airspace operations (HAO), ICAO was invited to establish a framework for the orderly development of HAO standards and harmonize all on-going activities including overflight of balloons and spacecraft.

2. DISCUSSION

2.1. Low-level flying operations

2.1.1 To manage the increasing number of applications for access to low-level controlled or uncontrolled airspace, MID States apply, in general, restrictions and segregation based on conditions and measures coordinated with the Air Navigation Service Providers (ANSPs). While the restriction of airspace access for UA and segregation of different types of airspace users for low-level flying operations is feasible with the current traffic density and can ensure safe aircraft operations, these arrangements will not cope with the increasing number of UA operating in low altitude airspace that might conflict with manned aviation and the ultimate goal should be, as specified in ICAO global UTM framework, an integration and equitable access to all airspace users considering the safety and efficiency objectives.

2.1.2 The orderly growth and integration of new entrants in low altitude airspace should be based on strategic evolution plan using phased and iterative approach covering the development, testing, validation, and introduction of new capabilities with the involvement of all stakeholders in the MID region. The use cases with lower risk operations can serve as opportunities to have better understanding, build experience, and refine requirements to expand the traffic of new entrants in low altitude airspace allowing the establishment of a full set of requirements covering advanced capabilities required for urban environments, where increased population, obstruction and traffic density are more complex. The delivery, surveillance, and inspection, and transport operations in remote and less populated areas may be considered as starting point for the gradual integration of new entrants in low altitude airspace.

2.1.3 Considering the similarities between the current low-level flying operations (e.g., helicopter and certain UAS flights) and the proposed concepts for new entrants i.e., UAM/AAM, the technical and operational regulatory requirements related to aircraft equipage, airspace, infrastructure, licensing, training may be advanced using other regulatory framework and developments related to ICAO UAS, global UTM framework, air traffic management (ATM) operations.

2.1.4 The implementation of air traffic management systems for the new entrants requires significant collaboration, coordination, education, and agreement between all stakeholders including government entities as it brings major changes to the current aviation sector as new concepts and technologies are used for flights management and integration. Therefore, there is a need to reactivate MID RPAS/UTM ACTION GROUP to support the introduction and management of UAS operations in the MID Region.

2.2. Higher Airspace Operations

2.2.1 The Higher airspace (HA) is described as the volume of airspace typically above altitudes where the

majority of air services are provided today (typically FL 550) and where HAO are carried out². It is foreseen that HA operations will be conducted by several different types of manned or unmanned vehicles with various flight profiles, such as balloons, supersonic/hypersonic aircraft, suborbital vehicles, re-entry of vehicles, sounding rockets, spacecraft etc., some of them flying or cruising in that airspace with others simply transiting through it. The HAO may pose safety risks when transiting through the current ATM operations in the airspace below the HA (i.e., below FL 550 or FL660) or when cruising in the HA.

2.2.2 The ICAO 14th Air Navigation Conference planned from 26 August 2024 - 6 September 2024, will provide an opportunity for detailed technical discussions which are expected to lead to agreement on a set of high-level recommendations in the field of air navigation and safety. The provisional agenda items 2.2 and 3.3 and of this conference will discuss respectively strategies to evolve existing frameworks to support the safe introduction of new aircraft technologies, and the technical update of the eighth edition of the Global Air Navigation Plan (GANP) which may include new thread related to Higher Airspace Operations.

3. CONCLUSION

3.1 The on-going research and rapid pace of development for the adoption of new entrants' (e.g., electric and hybrid aircraft with new airborne technology and capabilities) operations in urban, suburban, and rural environments is supported by an evolving technologies and business opportunities that may affect the whole MID States. The new electric Vertical Take-Off/lift and Landing aircraft (eVOL) capabilities, the required supporting ground infrastructure, and air traffic management systems will impact the current airspace monitoring systems, working arrangements, practices, and regulatory framework. Therefore, there is an urgency for a regional guidance considering the regional and global development.

3.2 As the agenda items of the ICAO 14th Air Navigation Conference are covering the new entrants operations, related safety aspects, and harmonization of their development at the global, it will be an opportunity for MID States to express their views, and expectations during this conference.

4. ACTION BY THE METING

4.1 The meeting is invited to:

- a) note the information provided in this WP; and
- b) invite the MID RPAS/UTM ACTION GROUP to progress its activities and develop necessary guidance to States related to Unmanned Traffic Management (UTM).

- END -

² Definition developed by the EASA HAO TF, as a preliminary description. In practice, the current civil aviation traffic does not fly above FL550.