International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)

WORKING PAPER

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20/09/24

Fourth GREPECAS–RASG-PA Joint Meeting and
Twenty-second Meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS/22)
Virtual Phase (Asynchronous, 16 September to 11 October 2024)
In-Person Phase (Lima, Peru, 20 to 22 November 2024)

Agenda Item 5: **CAR/SAM Air Navigation Services (ANS) Implementation**

5.1 Air Traffic Management (ATM), Airspace optimization, Air Traffic Flow Management (AFTM) and Search and Rescue (SAR)

HIGHER AIRSPACE OPERATIONS (HAO) AND SPACE OPERATION

(Presented by Brazil)

EXECUTIVE SUMMARY

There is a need to clarify the difference between higher space operations (HAO) and space operations and better identify their impact on ATM. Furthermore, it is necessary to support ICAO in the construction of the HAO concept that will help States in various issues, such as air navigation services and personnel licensing.
This paper also comments on the recent published Brazilian law to regulate space activities. It points out that it is necessary to define processes that reduce the impacts of these activities on the security and efficiency of the ATM, considering the predicted scalability of HAO.
Furthermore, it highlights the importance of countries in the CAR/SAM Region sharing experiences and establishing harmonized processes so that operations can scale safely and efficiently in the airspaces of countries in the region.

Action:	a) Discuss the importance of sharing experiences related to HAO and space operations interfering with international civil aviation. b) Discuss the importance of developing harmonized procedures for the CAR/SAM Region concerning HAO and space operations interfering with international civil aviation.
Strategic Objectives:	• Safety • Air Navigation Capacity and Efficiency • Economic Development of Air Transport • Environmental Protection
References:	• Doc 9854 The Global Air Traffic Management Operational Concept • Resolution A40-26 Commercial Space Transport • Resolution A41-9 New Entrants

1. Introduction

1.1 The resolution A40-26 of the ICAO Assembly held in 2019, Commercial Space Transport, reaffirmed the ICAO's role in developing guidance material to support establishing policies for monitoring commercial space operations where they overlap with international civil aviation activities. This makes it possible to deal with emergency issues without impacting international civil aviation operations. The resolution A41-9, New Entrants, recognizes the importance of adopting measures that ensure a harmonized and standardized global approach to Higher Airspace Operations (HAO).

1.2 The Resolutions mentioned in item 1.1 emerged due to the evolution of the aviation industry, which needs to adapt to integrate new types of operations into ATM systems. This integration is complex since the operation of new entrants is quite peculiar and different from that of other more well-known aircraft. Furthermore, their performances are different, which creates an additional challenge to accommodate traffic in more congested airspaces until they reach their operational environments.

1.3 In addition to the increase in HAO due to new entrants like balloons, supersonic/hypersonic aircraft, and suborbital aircraft, space operations have also increased, involving rocket launches and re-entry of space vehicles. Another new entrant in HAO are prototype capsules from Halo Airspace to test and validate space travel for observing the stratosphere. Therefore, a growing number of aircraft operates above FL 600 for months and even years, and year by year, new entrants emerge and show an interest in scaling up their activities.

1.4 Despite all that above, a clear definition of HAO is still missing. In December 2023, several governments worldwide requested ICAO to develop a holistic vision for the HAO to address several issues required to make these operations viable.

1.5 Brazil enacted Law 14.946 on July 31, 2024, to regulate space activities in the country. The law highlights that public or private entities or public entities in partnership with the private sector may explore civil space activities. This law aligns with Brazilian space policy, coordinated by the Brazilian Space Agency (AEB), which intends to increase the country's microsatellite launch capacity in the coming years and support investment for possible commercial launches and suborbital space tourism missions.

1.6 Considering the increase in the number of space launches and the start of HAO operations in Brazil, several challenges will arise related to integration with national airspace and ATM systems. Therefore, it is essential to discuss the standardization of procedures in the CAR/SAM Region and the need to share experiences among the countries of the CAR/SAM Region.

2. Discussion

2.1 The increase in space operations and the start of HAO by new entrants into Brazilian airspace will increase airspace volume segregation. This increase in segregation will impact ATM activities, as it will reduce airspace capacity.

2.2 Establishing flexible and scalable airspace and flow management procedures and information exchange is necessary. Additionally, it is essential to define contingency procedures to enable quick coordination in specific situations and ensure air traffic safety. Due to the characteristics of space operations and HAO, the importance of defining coordination protocols between countries in the

CAR/SAM Region due to cross-border operations and the need to share critical safety information in real time is also evident.

2.3 A new operations paradigm with aircraft and vehicles carrying out rapid ascent and descent transitions will require the establishment of dedicated corridors, tactically activated and deactivated, dynamic airspace volumes that accompany aircraft and space vehicles throughout their trajectories. Additionally, supersonic and hypersonic operations will reduce the time available for conflict resolution, requiring the use of new technologies for communication and surveillance.

2.4 Supporting an ICAO vision for the HAO and differentiating HAO operations from space operations, is essential so that States will know how to address issues related to air navigation services and personnel licensing, among others.

2.5 It's also important to highlight the need for countries in the CAR/SAM Region to share experiences related to HAO and space operations conducted in their airspace that interfere with ATM. It´s important to discuss a framework to have harmonized procedures for the entire region in the future.

2.6 Brazil appreciates Chile for the initiative to present AN-Conf/14-WP/110 in 14th Air Navigation Conference and the relevance of the topics covered.

3. Conclusion

3.1 Supporting the work on ICAO vision for High-Altitude Operations (HAO) and clearly differentiating these from space activities is vital for States to efficiently manage air navigation services. Furthermore, it is crucial for countries in the CAR/SAM Region to collaborate and share insights on HAO and space operations that affect Air Traffic Management (ATM). Developing a unified framework for procedures across the region will be key to overcoming these challenges and ensuring effective coordination going forward.

3.2 The Conference is invited to agree on the following recommendation:

That States:

a) Discuss the importance of sharing experiences related to HAO and space operations interfering with international civil aviation.

b) Discuss the importance of developing harmonized procedures for the CAR/SAM Region concerning HAO and space operations interfering with international civil aviation.

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