



International Civil Aviation Organization

MIDANPIRG/22 & RASG-MID/12 Meetings

(Doha, Qatar, 4 – 8 May 2025)

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

**CROSS-REGIONAL AIRSPACE OPTIMIZATION TO ENHANCE SAFETY,
CAPACITY, AND EFFICIENCY OVER THE HIGH SEAS**

(Presented by United Arab Emirates)

SUMMARY

This paper highlights the need for a comprehensive cross-regional airspace optimization strategy over the high seas to enhance safety, capacity, and efficiency. With growing air traffic demand, inconsistencies in separation standards, and operational constraints at Flight Information Region (FIR) boundaries, there is an urgent need to harmonize airspace structures, enhance coordination, and implement modern Air Traffic Management (ATM) solutions. This paper builds upon previous ICAO PIRG conclusions, national development efforts, and inter-regional discussions, proposing an action plan to address key challenges and improve operational efficiency in oceanic and trans-regional airspace.

Action by the meeting is at paragraph 4.

REFERENCE

- ICAO ASSEMBLY RESOLUTION A41-21 (ENVIRONMENTAL PROTECTION & CLIMATE CHANGE)
- ICAO GLOBAL AIR NAVIGATION PLAN (GANP, Doc 9750)
- PIRG AND RASG REPORTS FROM VARIOUS ICAO REGIONS
- FREE ROUTE AIRSPACE (FRA) AND AIR TRAFFIC FLOW MANAGEMENT (ATFM) DEVELOPMENTS
- RELEVANT FIR COORDINATION MEETINGS

1. INTRODUCTION

1.1 The airspace over the high seas and at the interface between regional FIRs is a critical transit corridor for international flights, requiring seamless ATFM, harmonized separation minima, and efficient routing structures

1.2 While some regional optimization efforts have been undertaken, many airspace volumes remain constrained by capacity limitations, route inefficiencies, and inconsistent ATM procedures across FIR boundaries. These challenges impact operational efficiency, increase fuel consumption, and affect environmental sustainability.

1.3 This paper proposes an integrated strategy to modernize high seas airspace through aligned separation minima, improved ANSP coordination, and cross-regional initiatives. In line with

AN-Conf/14-WP/40 (UAE), and complementing AN-Conf/14-WP/10 and WP/9, it supports establishing a framework for minimum service levels. Reflecting the goals of Project 30/10, it advocates uniform separation application and modern ATM solutions; such as ATFM, FRA, flexible use of airspace, and civil-military cooperation.

2. DISCUSSION

2.1 Challenges in cross-regional airspace management is seen in the growing complexity of air traffic operations over the high seas and across regional FIRs presents challenges related to airspace structures, operational procedures, and coordination. Differences in separation minima, inconsistent ATM practices, and fragmented decision-making processes result in inefficiencies and increased controller workload

2.2 Capacity of environmental considerations with rising air traffic demand, existing airspace structures to face constraints that limit operational flexibility and efficiency. Inefficient route design and procedural discrepancies contribute to increased fuel consumption and emissions, impacting ICAO's Long-Term Aspirational Goal (LTAG) of net-zero carbon emissions by 2050. Addressing these constraints is essential for sustainable airspace management.

2.3 Harmonization of airspace structures and procedures is essential to enhance operational efficiency, FIRs should align separation standards and optimize route structures to facilitate seamless traffic flow. The expansion of FRA will provide greater flexibility for airspace users while ensuring capacity optimization and safety improvements

2.4 Advancing ATM capabilities and coordination to strengthen ATFM and Collaborative Decision-Making (CDM) will improve traffic predictability, balance demand and capacity, and reduce operational delays. Enhanced digitalization and cross-border data sharing will further support situational awareness and improve inter-regional coordination, leading to a more resilient and efficient air navigation system.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) recognize the urgency of cross-regional airspace optimization to enhance safety, efficiency, and capacity over high seas;
- b) explore with ICAO Regional Offices to initiate and coordinate inter-regional initiatives supporting ATM harmonization;
- c) Encourage States and ANSPs to engage in cross-regional collaboration and active data sharing between FIRs to harmonize airspace structures and separation standards, enhance situational awareness, enable data-driven decision-making, and support effective ATFM and optimized cross-regional traffic flow;
- d) Support establishing joint Working Groups to expedite airspace enhancement Projects taking in considerations modern airspace concepts such as FRA and Direct Routing Operations (DRO) and establish the basis of Project 30/10 as means to improve airspace safety, efficiency and sustainability;