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)

CENTRAL SECTOR SPLIT IN MUSCAT ACC

(Presented by Sultanate of Oman)

SUMMARY

This paper presents the operational context, safety rationale, implementation activities, and technical evaluations conducted for the Central Sector Vertical Split in Muscat ACC, with a view to mitigating frequency congestion, improving controller workload distribution, and enhancing ATC service delivery. It outlines the operational justification, simulation results, technical challenges, and readiness measures being adopted to ensure a safe and effective transition.

Action by the meeting is at paragraph 3.

REFERENCE

- ICAO Annex 10, Vol. II, Aeronautical Telecommunications – Communication Procedures including those with PANS status, 7th Edition, Jul 2016
- ICAO Annex 11, Air Traffic Services, 15th Edition, Jul 2018
- ICAO Doc 9426, Air Traffic Services Planning Manual, 1st Edition, 1984
- ICAO Doc 4444, Procedures for Air Navigation Services- Air Traffic Management (PANS-ATM), 16th Edition, 2016
- ICAO MID Air Navigation Plan, Volume II, Feb 2016

1. INTRODUCTION

1.1 The Central Sector of Muscat ACC has experienced increasing levels of air traffic, resulting in significant congestion. Detailed assessments indicate that the primary contributor to this congestion is high frequency occupancy. This leads to delayed communications, reduced situational awareness, and an increased likelihood of airspace occurrences and safety events, particularly during peak periods.

1.2 To address these challenges, the Central Sector Vertical Split has been initiated as a strategic solution to redistribute air traffic across two defined Upper and Lower sectors aiming to reduce frequency occupancy, enhance communication clarity, and optimize controller workload, ultimately improving both safety and efficiency of overall ATC and airspace operations.

1.3 The implementation is expected to significantly enhance ATC efficiency and safety for traffic operating between The Sultanate of Oman, Kingdom of Saudi Arabia and the United Arab Emirates, as well as for overflying traffic transiting the Central Sector, in alignment with the provisions of the ICAO MID eANP, Volume II.

2. DISCUSSION

2.1 The proposed vertical split of the Central Sector is in accordance with the provisions outlined in ICAO Doc 9426, which provides guidance on sectorization based on traffic demand, airspace complexity, and controller workload. This reconfiguration aims to enhance sector efficiency, optimize workload distribution, and ensure safe and seamless service within Muscat ACC.

2.2 To assess the technical and operational viability of the vertical split, a series of foundational studies were conducted. These included the Sector Division Study, a comprehensive Traffic Analysis, and the development of a CONOPS tailored to the proposed sector split.

2.3 These studies proposed FL 315 or FL 335 as the preferred Division Flight Level (DFL)- the altitude that would serve as the boundary between the proposed upper and lower sectors. The suitability of the selected DFL is currently being assessed through dedicated Real-Time Simulation (RTS) evaluation exercises, in which the simulation scenarios have been configured to enable dynamic testing and determination of optimum sector split level.

2.4 The proposed vertical split results in the creation of two sub-sectors:

- CENTRAL LOWER: at or below FL 315 or FL 335
- CENTRAL UPPER: above FL 315 or FL 335

Ongoing and Planned Activities

2.5 The following activities have been planned to support the implementation of the Central Sector Vertical Split, several of which have already been completed under the ongoing phased approach, with full implementation targeted for completion by July 2025.

Scope of activities	Activities		Status of activities
1. Project initiation	1.1.	Arranging Kick-off meeting and initiate the project	Completed
2. CNS	2.1.	Frequency provision: 1- Central Upper and Central Lower 2- Back up 3- Emergency	Completed
	2.2.	VCCS configuration.	
	2.3.	Prepare latest DBM version compatible to both ACC/MCC	Completed
	2.4.	Ensuring that the database includes the sector split provisions	
3. ATM System	3.1.	ATM System Adaptation for the split	Completed
	3.2.	Verification	
	3.3.	Test	
	3.4.	Validation	
4. Technical Control	4.1.	Verifying the data provided for the SIM testing.	Completed
	4.2.	Develop the SIM exercises.	
	4.3.	Coordinate the required HR for the SIM.	
	4.4.	Conduct the SIM testing and evaluation.	
	4.5.	Submit the SIM evaluation report	In progress
5. SOP and other documentation	5.1.	SOP of Implementation of Vertical Split of Central Sector, HDI and other documentation	In progress

Scope of activities	Activities		Status of activities
6. Safety Activities	6.1.	Conduct Hazard analysis and safety risk assessment exercises	In progress
	6.2.	Submit the safety risk assessment report	Not initiated
7. ATC SIM Training	7.1.	ACC ATCO Vertical Sector Split Theoretical Briefing	Not initiated
	7.2.	SIM training	Not initiated
8. Publication	8.1.	Issuance of NOTAM/Trigger NOTAM	Not initiated
	8.2.	AIRAC AIP AMDT/SUPP	Not initiated
9. Implementation	9.1.	Implementation of Central Sector Vertical Split	Not initiated
10. Post Implementation Monitoring	10.1.	On-going monitoring of Split and ATCOs' workload for 30 days.	Not initiated
	10.2.	Collect ACC ATCO feedback through feedback form	Not initiated
	10.3.	Submit Post-Implementation Monitoring Report	Not initiated

Implementation Challenges

2.6 While the implementation is progressing, certain limitations have been identified. These include the constrained availability of ATCO manpower for simulator evaluation and technical restrictions in silent coordination, which is currently limited to three sectors.

2.7 Both issues are being actively addressed: human resource planning is underway to ensure adequate staffing for ongoing simulation sessions as well as for implementation phase, and technical discussions have been initiated with the system vendor to explore solutions for enhancing silent coordination capabilities.

Regulatory Compliance

2.8 Regulatory compliance will be ensured by meeting the provisions of ICAO Annex 10, Annex 11, and other applicable ICAO documents, prior to the submission of the implementation package for regulatory approval.

2.9 An initial SIM (Simulation) evaluation has indicated that the transition to a Vertical Split is feasible, meeting the regulatory requirements. However, certain operational issues were identified, which are considered manageable and will be addressed through the incorporation of appropriate procedures in the Muscat ACC Operations Manual (MATSOP).

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) agree to share lessons learned and best practices with other States in the region, and

c) discuss any relevant matters as appropriate.

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