



*International Civil Aviation Organization*

**MIDANPIRG/21 & RASG-MID/11 Meetings**

*(Abu Dhabi, UAE, 4 – 8 March 2024)*

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

**INTRODUCING NEW PBN TERMINAL FLIGHT PROCEDURES AT MUSCAT  
INTERNATIONAL AIRPORT**

*(Presented by Sultanate of Oman)*

**SUMMARY**

This paper outlines key measures and initiatives taken by Oman CAA in implementing the new PBN terminal flight procedures at Muscat International Airport to allow more efficient accessibility to the Airport and to optimize terminal airspace operations in alignment with ICAO strategic objectives.

**REFERENCES**

- Doc 8168, Vol. II, 7<sup>th</sup> Edition, 2020
- Doc 9906, Vol. 1, 1<sup>st</sup> Edition, 2009

**1. INTRODUCTION**

1.1 Muscat International Airport is currently equipped with one instrument runway and is prepared to enhance its operational capacity by introducing a second instrument runway, parallel to the existing one soon.

1.2 New PBN terminal procedures for the upcoming runway (RWY 08R/26L) are being developed, and simultaneously, PBN terminal procedures for the existing runway (RWY 08L/26R) are also being re-designed, taking into consideration simultaneous parallel runway operations in the future.

1.3 With the implementation of these IFPs, it is firmly anticipated that the terminal airspace operations of Muscat International Airport will be capable of meeting ICAO strategic objectives.

**2. DISCUSSION**

2.1 Oman CAA ensures that the design criteria as mentioned in the PAN OPS, Doc 8168 Vol. II and the design process mentioned in the Quality Assurance Manual for Flight Procedure Design, Doc 9906, Vol. 1 have been followed while developing the quality IFPs for Muscat International Airport.

2.2 Given the conceptual design's role as the foundation and starting point for IFP design, in-depth discussions were conducted to develop and finalize it with the active participation of major stakeholders, including Air Traffic Control Officers (ATCOs) and pilots.

2.3 No. of PBN IFPs that are designed and planned for implementation are:

- RNAV 1 STARs: Eight for RWY08L/R and eight RWY26L/R; total = 16
- RNP APCHs (LNAV, LNAV/VNAV): Two for RWY 08L/R and two for RWY 26L/R; total = 4

2.4 Besides, LNAV and LNAV/VNAV approaches, RNAV-onto-ILS approaches are also planned for all runway ends of Muscat International Airport.

2.5 The navigation specification used for the Initial, Intermediate, and Final approach segments is RNP APCH with a navigation accuracy of 1 nm in Initial and Intermediate Approach and 0.3 nm in the Final approach segment. RNAV 1 navigation specification has been used for the Missed Approach and STAR segments with a navigation accuracy of 1 nm.

2.6 All the waypoints for the use of ATC purposes are given 5LNC, available from the ICAO ICARD system.

2.7 Emphasis has been placed on designing flight procedures that accommodate continuous descent operations, taking into consideration future plans for PBN SIDs to facilitate continuous climb operations as well.

2.8 Independent verification and validation activities, along with the safety risk assessment involving relevant stakeholders, are ensured before the flight validation and regulatory approval of the IFPs.

2.9 To address the challenges posed by new PBN IFPs, a phased approach to ATC activities has been devised, encompassing PBN theoretical training along with practical SIM training for ATCOs.

2.10 Being a major change in the terminal procedures, two AIRAC cycles are planned for the implementation of new IFPs, publication date on 21 March 2024, with an effective date of 16 May 2024.

### **3. ACTION BY THE MEETING**

3.1 The Meeting is invited to:

- a) note of the information contained in this paper; and
- b) recognizing the initiative of Oman and its positive impact on terminal airspace safety and efficiency.