



International Civil Aviation Organization

MIDANPIRG/21 and RASG-MID/11

(Abu Dhabi, United Arab Emirates, 4 - 6 March 2024)

**Agenda Item 5.3: PBN**

**OUTCOME OF THE PBN SG/8 MEETING**

*(Presented by the Secretariat)*

<b>SUMMARY</b>
This paper presents the outcome of the PBN SG/8 meeting.  Action by the meeting is at paragraph 3.
<b>REFERENCES</b>
– PBN SG/8 Report

**1. INTRODUCTION**

1.1 The Eighth meeting of the Performance Based Navigation Sub-Group (PBN SG/8) was successfully held in Doha, Qatar, from 10 to 11 December 2023. The meeting was attended by a total of thirty-four (34) participants from ten (10) States (Egypt, Iran, Iraq, Jordan, Libya, Oman, Qatar, Saudi Arabia, UAE and Yemen).

**2. DISCUSSION**

***Performance Based Aerodrome Operating Minima (PB-AOM)***

2.1 The PBN SG/8 meeting was apprised of the PBAOM CONOPS. The meeting noted that in the PBAOM concept, the minima is predicated upon the combined capabilities of the ground and airborne facilities, i.e. the resulting performance for providing guidance during the instrument and visual segments of the approach and landing, hence the concept “Performance Based Aerodrome Operating Minima” (PBAOM).

2.2 The meeting noted also that the CONOPS is aiming primarily to provide information on the proposed concepts of Performance Based Aerodrome Operating Minima. The purpose is also to describe the expected impact for other domains such as aerodromes, air traffic management and navigation systems providers. Thereby, CONOPS is intended as a coordination instrument between the domains affected by attempting to describe all aspects of PBAOM. Such coordination is intended to be the first step, after which a fully coordinated CONOPS PBAOM can be developed. The CONOPS, notably with its Appendix provide practical examples how PBAOM will influence the interaction between operators, ATC and aerodromes.

2.3 In order to provide a deep understanding of the concept, the implications of PBAOM on the aerodrome design and operation, including the challenges of operating in very low visibility and the

need to consider how to accommodate advanced aircraft operating at the aerodrome to expand aerodrome availability in restrictive weather conditions, the meeting agreed to the following Draft Conclusion:

<b>Why</b>	To provide a deep understanding of the PBAOM and its concept of operations.
<b>What</b>	Conduct a Webinar on PBAOM CONOPS
<b>Who</b>	ICAO
<b>When</b>	2024

***DRAFT CONCLUSION 8/1: WEBINAR ON PERFORMANCE-BASED AERODROME OPERATING MINIMA (PB-AOM)***

*That, a Webinar on the Performance-Based Aerodrome Operating Minima (PB-AOM) be organized in 2024.*

***DOC 9849, GNSS Manual Update Summary***

2.4 The PBN SG/8 meeting was apprised of the latest updates introduced with the release of Doc 9849, 4<sup>th</sup> Ed 2023, in particular:

- The potential changes with respect to the new DFMC SBAS standards. Guidance material on GNSS performance reporting for GNSS service providers.
- The inclusion of new operational core constellations and new signal for existing constellations.
- The DFMC SBAS SARPs changes and new SBAS SARPs amendment.
- GNSS Vulnerability – the significant material to address recent developments and thinking with respect to jamming and spoofing.
- GNSS Evolutions and the operational state of GALILEO and BDS providing information on their planned future evolutions.
- Chapter 7: GNSS Implementation – interference monitoring, interference anomaly reporting, and space weather advisory.

2.5 Based on the above, and to provide an opportunity for detailed discussions on the implementation of different GNSS elements/options and associated challenges, the meeting agreed to the following Draft Conclusion:

<b>Why</b>	To provide a forum for sharing the current developments and future evolutions related to GNSS along with implementation of different GNSS elements/options and associated challenges.
<b>What</b>	Conduct a Workshop on GNSS
<b>Who</b>	ACAO/ICAO
<b>When</b>	2024

***DRAFT CONCLUSION 8/2: WORKSHOP ON GNSS***

*That, ICAO, jointly with ACAO organize a Workshop on GNSS in 2024.*

2.6 The PBN SG/8 meeting recalled that MIDANPIRG/20 through Decision 20/12, established the RANP/NANP Task Force to ensure alignment of the MID Region Air Navigation Strategy and MID ANP Vol III with the latest edition of the GANP and assist States developing NANPs and agreed to bring the proposed changes to the attention of the RANP/NANP Task Force for further consideration.

***Status of PBN Implementation in the MID Region***

2.7 The PBN SG/8 meeting reviewed and updated the status of PBN Implementation in the MID Region. The MID Region PBN implementation status by ASBU APTA element is presented below:

<b>APTA Elements</b>	<b>B0/1 PBN Approaches (basic)</b>	<b>B0/2 PBN SID and STAR Procedures (basic)</b>	<b>B0/4 CDO (Basic)</b>	<b>B0/5 CCO (Basic)</b>	<b>B0/7 PB-AOM</b>
<b>Average per Element</b>	53.3%	53%	65.2%	65.2%	73.3%

2.8 The following was highlighted:

- The status of implementation of the APTA B0/1 related to PBN Approaches (with basic capabilities) reached 53.3% far behind the regional target of 100% by Dec. 2017.
- The status of implementation of the APTA B0/2 related to PBN SID and STAR procedures (with basic capabilities) is 53% behind the regional target of 70% by Dec.2022.
- The status of implementation of the APTA B0/4 and B0/5 which reached 65.2%; each element is far behind the regional target of 100% by Dec. 2021.
- The status of implementation of the APTA B0/7 related to Performance based aerodrome operating minima – Advanced aircraft which reached 73.3% above the regional target of 50% by Dec. 2021.

2.9 The PBN SG/8 meeting urged States that have not yet done so, to develop and submit PBN implementation plans as soon as possible and States with existing plans to ensure that their plans are robust and are aligned with the ICAO MID Region plan and PBN requirements.

2.10 The PBN SG/8 meeting urged also those States behind Global and Regional targets to expedite implementation of PBN to achieve the global targets of the Assembly Resolution A37-11 and the regional targets of the MID Air Navigation Strategy.

2.11 The meeting recalled MIDANPIRG Conclusion 20/26 related to the PBN Capacity-Building And Assistance Activities and encouraged States to inform the ICAO MID Office of their needs in terms of PBN capacity-building and required assistance activities, and guidance related to PBN planning, implementation, including improvement of practices in PBN Design, operational approval, and continuous oversight.

***GNSS disruption in MID Region***

2.12 Further to the increasing number of GNSS disruption events around the globe and in particular in the MID Region, the PBN SG/8 meeting recognized the safety of flight risks related to the GNSS spoofing and jamming activities reported by various AOs and international organizations and was apprised of a number of mitigation measures for ANSPs and CAAs.

2.13 The PBN SG/8 meeting recalled that the SARPs of Annex 10 Volume 1 have been recently updated to add requirements for DFMC SBAS, new core constellations and additional core constellation signal. In addition, the latest updates on the DOC 9849, GNSS Manual, in particular Chapter 5 GNSS Vulnerability with the significant material added to address recent developments with respect to jamming and spoofing.

2.14 The PBN SG/8 meeting agreed that the RASG-MID Safety Advisory (RSA-14) should be updated to reflect recent developments and changes to maintain its effectiveness and reliability.

2.15 Furthermore, the PBN SG/8 meeting recalled that the MIDANPIRG/20 endorsed through MIDANPIRG Conclusion 20/18 a NOTAM TEMPLATE FOR GNSS INTERFERENCE. Based on the recent new entry of GNSS Spoofing, the meeting expressed the need that the NOTAM Template should be updated to reflect the spoofing activities and its effect on safety of flight operations.

2.16 The PBN SG/8 meeting recalled that a number of Action Groups were established to work on the subject and for an improved efficiency, agreed on the need to have one multi-disciplinary Action Group to coordinate and propose measures to mitigate this risk. The AG should be composed of the Chairpersons of the AIM SG, ATM SG, CNS SG and PBN SG as well as from experts with different technical background/expertise from States and stakeholders, including ICAO and IATA. In addition, and in order to avoid proliferation and unnecessary duplication of efforts, the meeting agreed to raise the subject to the MIDANPIRG/21 meeting for consideration and direction.

***PBN Charting: SID/STAR***

2.17 The PBN SG/8 meeting noted discrepancies in PBN SID/STAR charts published in MID States' AIPs, including issues related to chart title, chart identification and PBN Box.

2.18 The meeting noted that ICAO State Letter 2023/07 provided requirements in Annex 4 and PANS OPS (Doc 8168) concerning PBN box and charting of PBN SIDs and STARs, however specimen charts were not included. It was noted also that it may still take considerable time until a chart specimen is published in the ICAO Charting Manual (Doc 8967).

2.19 The absence of harmonization in SID/STAR charts poses significant challenges for Aviation Users (AUs), introducing potential confusion for both pilots and Air Traffic Control (ATC). Common issues stemming from this lack of standardization include variations in the publication of Performance-Based Navigation (PBN) information, charts that are difficult to interpret and challenges in finding critical information. Recognizing the imperative role of harmonization in enhancing safety, efficiency, and standardization, ongoing efforts are crucial. The meeting therefore agreed to the following Draft Decision :

<b>Why</b>	To develop guidance/Specimen of PBN SID and STAR Charts to promote harmonization and consistency in the publication of PBN charts
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<b>What</b>	Establishment of PBN SID and STAR Charting Ad Hoc Working Group
<b>Who</b>	MIDANPIRG/21
<b>When</b>	March 2024

***DRAFT DECISION 8/4: PBN SID AND STAR CHARTING AD HOC WORKING GROUP***

*That a PBN SID and STAR Charting Ad Hoc Working Group ,*

*a) be established to develop guidance/Specimen of PBN SID and STAR Charts, in coordination with the AIM Sub Group.*

*b) be composed of:*

*— Chairpersons of the PBN SG and the AIM SG*

*— Mrs. Pamela Erice (Qatar)*

*— Mr. Saqr Obaid Al Marashda (UAE)*

*— Mr. Kedari Manthanwar (UAE)*

*— Mr. Muhammad Aljuhani (KSA)*

*— Mr. Ayed Murfat (KSA)*

*— Mr. Raed Ghazawi (Jordan)*

*— Mr. Sulaiman Selmi (Oman)*

*— Mr. Suwarn Raj Upadhyay (Oman)*

*— Mr. Taha Mohamed Taha (Egypt)*

*— ICAO Secretariat*

*c) presents its outcome to the PBN SG/9 and AIM SG/11 meetings.*

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

a) note the outcomes of the PBN SG/8 meeting;

b) endorse the proposed Draft Conclusions.

c) provide guidance and direction to the relevant Action Group to update current GNSS materials and priorities.