



International Civil Aviation Organization

**Ninth Meeting of the Performance Based Navigation Sub-Group
(PBN SG/9)**

(Doha, Qatar, 9 - 11 December 2024)

Agenda Item 6: PBN Planning and Implementation in the MID Region

PBN CHARTING: SID/STAR

(Presented by Oman)

SUMMARY

This paper offers comprehensive guidance aimed at achieving uniformity in the publication and presentation of PBN SID-STAR charts throughout the Middle East region. By harmonizing charting practices with ICAO requirements and international best practices, States can significantly improve the clarity, usability, and safety of these essential navigation tools.

Action by the meeting is at paragraph 3.

REFERENCES

- Annex 4- Aeronautical Charts, 11th Ed.
- PANS OPS Doc 8168, Vol. II, 7th Ed.
- Doc 8697- Aeronautical Chart Manual, 3rd Ed.
- PBN Manual, Doc 9613, 5th Ed.
- Outcomes of the of the PBN SID and STAR Charting Ad Hoc Working Group
- Eurocontrol Factsheet on PBN SID/STAR charts Harmonised AIP Publication

1. INTRODUCTION

1.1 The harmonization of PBN SID and STAR charts is critical to ensuring safe and efficient air navigation operations. Variations in charting practices across different states can lead to inconsistencies, causing confusion for pilots and ATCs. This guidance document aims to provide a structured approach for the Middle East region to standardize PBN SID-STAR charting, incorporating best practices and meeting the ICAO requirements.

1.2 The primary objective of this guidance document is to achieve uniformity in the publication and presentation of PBN SID-STAR charts across the Middle East region. By aligning charting practices with ICAO requirements and international best practices, States can enhance the clarity, usability, and safety of these critical navigation tools.

2. DISCUSSION

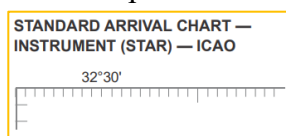
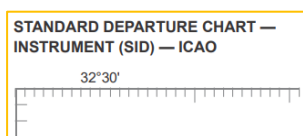
2.1 The following are presented as explanatory guidance for MID States regarding the factsheet on PBN SID/STAR charts in the context of Harmonised AIP Publication. These recommendations aim to assist States in understanding the key elements and best practices necessary for effective implementation, ultimately enhancing the consistency and quality of PBN charting across the region.

ICAO Charting Provisions

1. ICAO Provisions for Chart Titles:

References: ICAO Annex 4, Doc 8697 and Doc 8168 Vol. II

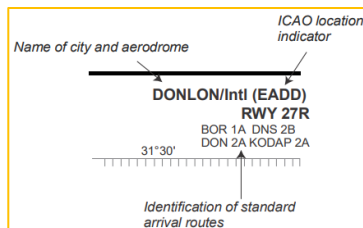
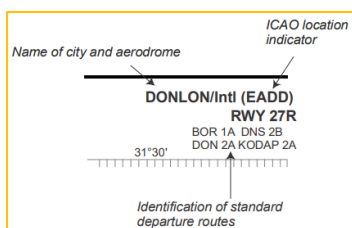
- Chart shall be titled in accordance with Annex 4 specifications.
- The chart title shall not include “ICAO” unless the chart conforms with all ICAO Standards mentioned in the Annex.
- The title must be “Standard Departure Chart — Instrument (SID) — ICAO” for SID and “Standard Arrival Chart — Instrument (STAR) — ICAO” for STAR.
- The chart title is placed at the top left corner of the chart in bold upper-case type.



2. ICAO Provisions for Chart Identifications:

References: ICAO Annex 4, Doc 8697 and Doc 8168 Vol. II

- The chart shall be identified in accordance with Annex 4 requirements and shall include the term RNAV or RNP, depending on the navigation specification.
- The chart should include an identifier which is unique for that aerodrome and which may include reference to either a runway, fix or NAVAID.
- The chart shall be identified by the name of the city or town or area which the aerodrome serves, the name of the aerodrome, and the identification of the SID or STAR.
- The ICAO location indicator may also be included with the name of the aerodrome.
- The chart identification is placed at the top right corner of the chart in bold upper-case type.



3. ICAO Provisions for PBN Requirement Boxes:

Reference: Doc 8168 Vol. II

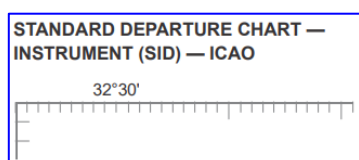
- a. The provision of PBN requirement boxes is missing in Annex 4 and Aeronautical Chart Manual and specification charts except for those in Doc 8168, Vol. II.
- b. PBN items shall be published in a PBN requirements box.
- c. The PBN requirements box shall include:
 - the identification of the navigation specification used in the procedure design, such as RNAV 5, RNAV 2, RNAV 1, A-RNP, RNP AR and RNP 1.
 - any navigation sensor limitations, such as GNSS required, DME/DME required.
 - any required functionalities that are described as options in the navigation specification, such as RF required.

Guidance for Chart Harmonization:

1. Standardizing Chart Titles:

- a. Ensure all SID charts are titled as “Standard Departure Chart - Instrument (SID) - ICAO” and all STARs charts as “Standard Arrival Chart - Instrument (STAR) - ICAO”.
- b. The title should be placed at the top left corner of the chart in bold upper-case type.
- c. Do not use ICAO in the chart title if the chart does not meet the Annex 4 charting criteria.
- d. Do not use any other things, such as PBN, RNAV, RNP or DEP/ARR, in the chart titles.

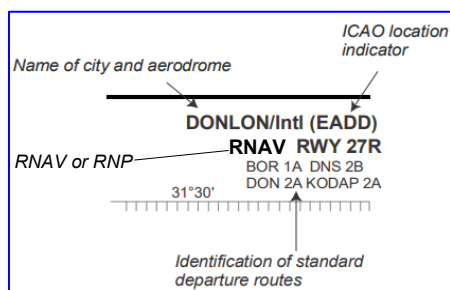
Example:



2. Consistent Chart Identification:

- a. Identify charts by the name of the city or town, the aerodrome name, and the identification of the standard departure/arrival routes.
- b. Include the ICAO location indicator with the name of the aerodrome.
- c. The chart identification should be placed at the top right corner of the chart in bold upper-case type.
- d. Use 'RNAV' or 'RNP' based on the navigation specification used in designing the SIDs or STARs. For example, use 'RNAV' for an RNAV1 SID or STAR, and use 'RNP' for an RNP1 SID or STAR, before the runway designation.

Example:



3. Requirements for PBN Boxes:

- a. Include PBN items in the PBN requirements box, preferably on the plan view of the chart, not obscuring the chart information. Do not use such information in any places other than PBN requirement box.
- b. The PBN box should contain the navigation specification (e.g., RNAV 1, RNP 1 or A-RNP) that is used for the design of PBN SID or STAR.
- c. Clearly specify any sensor limitations (e.g., GNSS required or DME/DME required) within the PBN box, as required.
- d. Include any additional functional requirements (e.g., RF required) in the PBN requirement box, as applicable.

Example 1: With sensor limitations and functional requirement	<div> <div>Navigation Specification</div> <div>Sensor Limitations</div> <div>Functional Requirements</div> </div> <div> <div>> RNP 1</div> <div>> GNSS and DME/DME required</div> <div>> RF required</div> </div>
Example 2: No sensor limitations, but with a functional requirement for RF	<div> <div>A-RNP</div> <div>RF required</div> </div>
Example 3: GNSS or DME/DME/IRU only allowed, with no functional requirements	<div> <div>RNAV 2</div> <div>GNSS or DME/DME/IRU required</div> </div>
Example 4: GNSS only allowed, with no functional requirements	<div> <div>RNAV 1</div> <div>GNSS required</div> </div>
Example 5: No sensor limitations and functional requirements	<div> <div>RNAV 5</div> </div>

2.2 Harmonizing PBN SID-STAR charting practices within the Middle East region is essential for enhancing operational safety and efficiency. By implementing the explanatory guidance as mentioned in para 2.1 above, States can achieve a higher level of standardization, benefiting all stakeholders involved in air navigation.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) review and discuss the content of this Working Paper;
- b) promote awareness of harmonized charting practices to enhance the safety and efficiency of aircraft and ATS operations; and
- c) encourage States to establish a review mechanism to periodically assess and update the PBN SID-STAR charting guidelines based on user feedback and evolving ICAO standards.