



International Civil Aviation Organization

**THE TENTH MEETING OF PERFORMANCE BASED NAVIGATION
IMPLEMENTATION COORDINATION GROUP (PBNICG/10)**

Bangkok, 19 - 21 April 2023

Agenda Item 4: States' PBN Implementation Progress and the challenges faced by the States and lessons learnt

PBN IMPLEMENTATION PROGRESS

(Presented by Islamic Republic of Pakistan)

SUMMARY

This paper presents current status and plans for PBN implementation in Pakistan

1. INTRODUCTION

1.1 Performance Based Navigation (PBN) has promising potential for efficient, reliable air navigation and utilization of airspace. Recognizing the benefits of PBN and considering highest priority for PBN in air navigation, Pakistan has shown significant progress in PBN implementation. Pakistan has developed its Performance Based Navigation implementation plan, to ensure progressive implementation of Performance Based Navigation in line with ICAO Global and Regional (APAC) Air Navigation Planning framework. The planned work on RNP APCH Procedures at all instrument runways has been completed. PBN departures based on RNP-1 navigation specification have been implemented to all IFR runway ends, where practicable. In the context of en-route phase, almost all major air traffic flow routes supporting air traffic flow between Europe and Asia have been transformed to PBN routes based on RNP10 and RNAV5 PBN specifications. According to the APAC Regional plan, Pakistan had completed the transition of RNAV to RNP charts in August 2020. Pakistan is now looking forward to use advanced capabilities of aircraft in the context of PBN.

2. DISCUSSION

En-route Implementation

2.1 Pakistan based on its geography has lot of limitations and complexities in traffic flow. Pakistan is at the western boundary of the ICAO Asia/Pacific Region interfacing with ICAO MID Region. It has adjoining airspace of Oman and Iran towards west where RNAV 5 is being used. RNP10 has been implemented in APAC region including Afghan airspace to support regional harmonization. Pakistan is trying to work cooperatively bilaterally, multilaterally to ensure ATS route structure optimization and regional and sub regional harmonization of en-route PBN implementation.

- 2.2 Pakistan is ready to introduce the more accurate navigation specification of RNP2 on the basis of ICAO APAC seamless ANS Plan in coordination with stakeholders and adjacent States subject to readiness of every stakeholder.

Terminal / Approach Implementation

- 2.3 Pakistan is already on the roadmap for PBN implementation since 2009 and has completed target implementation of RNP APCH procedures and associated STARs (where applicable) at all instrument runway ends in 2018, which constitute 100% of the required work. Now the Periodic review of all implemented procedures are being carried out with the study to look into the possibilities of further improvement. Statistical Analysis of RNP APCH implementation is given below:

International			Domestic			Overall		
Target	Published	%age	Target	Published	%age	Target	Published	%age
25	25	100	21	21	100	46	46	100

- 2.4 Development of RNP Standard Instrument Departure (SIDs) was also one of the priority tasks. In this regard, Pakistan has implemented RNP-1 navigation specification PBN departures to all IFR runway ends, where practicable.
- 2.5 CCO / CDO procedure is one of the important aspect of PBN implementation. In this context, Pakistan has incorporated the PBN airspace design concept to possible extent with separation between arrival and departure trajectories at major airports like Faisalabad, Islamabad, Karachi and Lahore, to improve traffic flow which will support CCO / CDO operations.

Future Developments

- 2.6 Pakistan is already in the process to look into RNP AR APCH implementation at some airports in the northern part having typical surrounding terrain not allowing normal IFR aircraft operation.
- 2.7 Pakistan is also in the process of exploring the possibility of SBAS implementation for better use of RNP APCH operations with vertical guidance.

3. ACTION REQUIRED BY THE MEETING

- 3.1 The meeting is invited to:
- a) note the information contained in this papers; and
 - b) discuss any relevant matter as appropriate.



Presentation on
**THE TENTH MEETING OF
PBN IMPLEMENTATION COORDINATION GROUP (PBNICG/10)**
PBN Implementation Progress Pakistan

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- **INTRODUCTION**
- **EN-ROUTE IMPLEMENTATION**
- **TERMINAL / APPROACH IMPLEMENTATION**
- **FUTURE DEVELOPMENTS**
- **SUMMARY**

- **Recognizing the benefits of PBN**
- **Significant progress in PBN implementation**
- **Performance Based Navigation implementation plan:**
 - to ensure progressive implementation of PBN;
 - in line with ICAO Global and Regional (APAC) ANP.
- **RNP APCH Procedures target completed.**
- **PBN departures RNP1 NAV Spec. implemented.**
- **Transition of RNAV to RNP charts (in August, 2020).**
- **PBN routes based on RNP10 and RNAV5 PBN specifications.**

- **Western boundary of the ICAO Asia/Pacific Region.**
- **Oman and Iran towards West.**
 - RNAV 5
- **APAC region, to support regional harmonization.**
 - RNP 10
- **Ready to introduce RNP2 on the basis of:**
 - ICAO APAC seamless ANS Plan
 - coordination with adjacent States
 - readiness of every stakeholder.

TERMINAL / APPROACH IMPLEMENTATION

- PBN implementation roadmap since 2009.
- RNP APCH and associated STARs implemented in 2018.
- Constituted **100%** of the required work.

INTERNATIONAL			DOMESTIC			OVER ALL		
Target	Published	%age	Target	Published	%age	Target	Published	%age
25	25	100	21	21	100	46	46	100

- **Periodic review**
 - possibilities of further improvement.

Contd....

- **RNP SIDs, one of the priority task.**
- **Implemented RNP1 Nav Spec. SIDs, where practicable.**
- **CCO / CDO for PBN implementation.**
- **PBN airspace design principles.**
- **Karachi, Islamabad, Lahore and Faisalabad:**
 - Support CCO / CDO operations.

- **RNP AR APCH implementation in Northern part of Pakistan:**
 - typical surrounding terrain;
 - normal IFR aircraft operation.

- **Exploring the possibility of SBAS for better RNP APCH ops.**

- **Roadmap for PBN implementation.**
- **Completed target implementation of:**
 - RNP APCH procedures;
 - PBN SIDs procedures.
- **RNP STARs based on RNP1 Navigation Specification:**
 - implemented at all major Airports;
 - CCO & CDO technique.

Thank you