

**57th CONFERENCE OF
DIRECTORS GENERAL OF CIVIL AVIATION
ASIA AND PACIFIC REGIONS**

*Incheon, Republic of Korea
4 – 8 July 2022*

AGENDA ITEM 4: AIR NAVIGATION

STATES' PBN IMPLEMENTATION PROGRESS

Presented by the Islamic Republic of Pakistan

INFORMATION PAPER

SUMMARY

This paper presents current status and future plans for implementation of Performance Based Navigation (PBN) in Pakistan.

STATES' PBN IMPLEMENTATION PROGRESS

1. INTRODUCTION

- 1.1 Pakistan Civil Aviation Authority has taken required steps towards PBN implementation recognizing its benefits and considering highest priority in air navigation. Pakistan developed First National PBN Implementation Plan in May 2009 and currently the fourth version (2020 to 2024) is in place. The plan was implemented in phases and currently Phase II is in process with Standard Instrument Departures (SIDs) / Standard Terminal Arrival Routes (STARs).
- 1.2 At present all operational airports have Required Navigation Performance Approach (RNP APCH) procedures in place at all instrument runways supported by STARs, where feasible. All major international airports having jet aircraft operations are being served with RNP-1 Standard Instrument Departures (SIDs). In order to have maximum benefits of PBN, integration of PBN / ILS has also been provided for runways equipped with ILS. Pakistan is now looking forward to use advanced capabilities of aircraft in the context of PBN.

2. DISCUSSION

En-route Implementation

- 2.1 Pakistan is at the boundary of the ICAO Asia/Pacific Region interfacing with ICAO MID Region. It has adjoining airspace with Oman and Iran towards west where Area Navigation (RNAV 5) is being used. In APAC region including Afghan airspace, RNP10 has been implemented.
- 2.2 In order to support regional harmonization, Pakistan in the year 2015 transformed a number of ATS Routes serving major traffic flows (from Tehran, Muscat and Kabul FIR to Delhi & Mumbai FIR) into PBN ATS routes with navigation specification of RNP10 and RNAV5 for enroute phase.
- 2.3 Pakistan is also working towards APAC seamless ATM Plan implementation. The review of PBN navigation specification as RNP 2 for enroute phase of flight is under study to enable implementation in harmony with the adjacent states as and when required to achieve PBN goals. However, due to airspace limitations, the real benefits of parallel route spacing for RNP 2 are not likely to be achieved till the neighboring states plan to implement the same.

Terminal / Approach Implementation

- 2.4 Pakistan had completed target implementation of RNP APCH and associated STARs at all instrument runway ends in 2018. Pakistan has been really benefitted in terms of saving fuel and time during critical approach phases by the implementation of RNP APCH procedures at all instrument & non-instrument runways where the provisions of conventional procedures were not practicable due to airspace limitations. A Statistical Analysis of RNP APCH implementation at all airports (excluding Gilgit, Chitral & Skardu. is given below:

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

- 2.5 As the provision of RNP APCH based on Lateral/Vertical Navigation (LNAV) or LNAV/VNAV is being used in Pakistan, ILS remains the primary approach, where available. Pakistan has therefore initiated the process for PBN / ILS integration to gain PBN implementation benefits. RNP1 initial segments followed by ILS precision segment are presently available at airports where ILS facility is available.
- 2.6 RNP Standard Instrument Departures (SIDs) are also important aspect of PBN implementation. Pakistan has implemented PBN departures at all major airports. The process of implementing PBN departures at other airports is ongoing which is likely to be completed by 31st December 2022.
- 2.7 Implementation of Continuous Climb Operation /Continuous Descent Operation (CCO / CDO) procedures is also one of the priority tasks. However, limited aircraft operations and availability of ATS surveillance facility had enabled to optimize operations at major airports. In this context, efforts were also made to incorporate the PBN airspace design principles to possible extent in trajectories at major airports of Faisalabad, Islamabad, Karachi and Lahore.

PBN Operational Approvals

- 2.8 Percentage of Fleet having PBN OPS approval for En-route operations = 67% (8 out of 12 airline operators)
Percentage of Fleet having PBN OPS approval for Terminal operations (SID/STAR) and Approach operations (RNP APCH) =75% (9 out of 12 airline operators)

Future Developments

- 2.9 The northern parts of Pakistan have high mountainous terrain environment. A number of airports are operational in those areas but limited to Visual Flight Rule (VFR) operation during day only. Pakistan CAA is planning to explore the possibility to implement RNP AR operations at these airports. The phased plan is based on the study of feasibility in the first phase, which has already started. Subject to feasibility, further steps for implementation of RNP AR provisions will be undertaken.
- 2.10 Pakistan is also in the process of exploring the possibility of Satellite Based Augmentation System (SBAS) implementation for better use of RNP APCH operations.

3. ACTION REQUIRED BY THE MEETING

- 3.1 The Conference is invited to note the information contained in this Paper.

— END —