International Civil Aviation Organization

The Ninth Meeting of the ICAO Asia/Pacific Performance-Based Navigation Task Force (PBN/TF/9)

Bangkok, Thailand, 27-30 March 2012

Agenda Item 5: State/Industry Updates

PBN Implementation status - India

(Presented by India)

SUMMARY

This paper presents the current PBN Implementation status in India as per its PBN implementation Road Map adopted by Director General of Civil Aviation India in 2009 and submitted to PBN/TF/6 in 2010 and reviewed by APAC PBN TF in 2010. This will also highlight the planned PBN implementation in the near future.

This paper relates to –

Strategic Objectives:
> A: **Safety** – *Enhance global civil aviation safety*
> C: **Environmental Protection and Sustainable Development of Air Transport** – *Foster harmonized and economically viable development of international civil aviation that does not unduly harm the environment*

Global Plan Initiatives:
GPI-5   RNAV and RNP (Performance-based navigation)

1. **INTRODUCTION**

Airports Authority of India (AAI) has already developed PBN Road Map, which was assessed by ICAO-APAC as Robust plan, to implement PBN procedures in the approach, terminal and en-route phase of the flight. As per the plan RNAV -1 SIDs and STARs have been developed and implemented in the nine busiest terminal areas at Delhi, Mumbai, Kolkata, Chennai, Hyderabad, Bangalore, Trivandrum, Ahmadabad and Cochin. These procedures are under development for other terminal areas also. RNP-10 routes are already in place in the oceanic area. RNAV-5 routes will be implemented between city pairs, which will result in fuel saving and reduced emission. In the approach, RNAV (GNSS) procedure has been published at Cochin International Airport and the same will be implemented at all major Airports as per the PBN Road Map.

2.   Status:

2.1   Approach Operations

Implementation Targets (#of RWY ends)			Completed (#of RWY ends)		In Progress (# of RWY ends)	
Y2010	Y2014	Y2016	LNAV	LNAV/VNAV	LNAV	LNAV/VNAV
28	42	38	1	1	16	16

2.2   Arrival/Departure Operations

Implementation Targets (# of Intl airport)			Completed (# of Intl airport)		In Progress (# of Intl airport)	
Y2010	Y2014	Y2016	Arrival	Departure	Arrival	Departure
6	15	-	9	8	5	5

2.3   Enroute Operations

Navigation Specification	Completed (# of routes)	In progress (# of routes)
RNAV 10	-	33
RNAV 5	-	6
RNAV 2	-	-
RNP 4	-	-
RNP 2	-	-

2.4   RNP-AR Procedure

RNP-AR procedure has been developed for Rwy 32 at Mumbai Airport for better utilization of the runway. Presently, Rwy 32 has VOR procedure with an OCH of 1414 ft and minima of 5 Km. ILS is not feasible on this runway due to site constraints. With the design of RNP-AR procedure it has been possible to reduce DA from existing 1414 ft to 423 Ft (RNP 0.3) and minima to 2.4 Km. Validation of the procedure in flight simulator is scheduled to be carried out in B737 simulator in Singapore in the month of May'2012.

2.5   RNAV-5 Routes

Apart from the implementation of RNAV-5 routes in the city pairs, we also propose to implement RNAV-5 routes in the cross border areas and continental airspace, if supported by the adjacent states.

2.6   Implementation of GAGAN

GAGAN is scheduled to be commissioned by 2013. The GAGAN signal is available for test purpose in the entire airspace over India. The certification process is underway.

2.7   PBN Procedure Design Training

India has developed in house capability to develop, validate and implement PBN procedures. Further to enhance the strength of PBN procedure designers, PBN procedure design training was conducted in 2011 at Civil Aviation Training College, India for 12 internal participants.

2.8   RAIM prediction information

GPS Visibility Tool has been developed. Every day at 0001UTC NOTAM is issued listing the duration when RAIM Holes are likely to occur in next 24Hr at every airport. The tool is being hosted on AAI website for providing users with online RAIM prediction capability.

2.9   Hosting 8th PBN Task-force

India was given a privilege to host 8th PBN task-force in May'2011 in New Delhi, which further helped our cause in PBN implementation by showcasing our capability to our administration.

2.10   PBN Go-Team

India is willing to host PBN Go team in the month of June'2012 to assist us in identifying areas of PBN improvement by a visiting group of experts (both ICAO and industry), to enable us to act as 'Champion States' for other States in the PBN field.

3.   ACTION BY THE MEETING

3.1   The meeting is invited to:

a.   Note the PBN Implementation status in India and our willingness to share our knowledge in the field with member states, particularly countries across our borders.

b.   To urge the states to encourage the Airlines operators to suitably equip themselves to derive the maximum advantage from these developments.

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