



**12<sup>th</sup> Meeting of Arabian Sea-Indian Ocean ATS Coordination Group ASIOACG/12) & 8<sup>th</sup> Meeting  
of Indian Ocean Strategic Partnership to Reduce Emissions (INSPIRE/8)  
New Delhi, India, 20 - 21 September 2017**

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**AGENDA ITEM 6: Communication/Navigation/Surveillance Issues including Performance Based Navigation (PBN), Data Link Services, FIT/CRA and Surveillance Data Sharing Amongst ANSPs**

**PBN IMPLEMENTATION IN TERMINAL AIRSPACE IN INDIA**

(Presented by India)

**SUMMARY**

This paper presents the current PBN Implementation status in India in Terminal Airspace 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 PBN Road Map was further revised in 2011 and a revised road map was submitted in 2011 in accordance with ICAO Assembly resolution A37-11 regarding Performance Based Navigation global goals.

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**

1.1 Airports Authority of India (AAI) had already developed PBN Road Map, which was assessed by ICAO-APAC as Robust plan. As all high density airports have surveillance based approach control and most of the runway ends have been provided with ILS and VOR procedures, the initial priority was Terminal and En-route, accordingly terminal and en-route procedures were developed. As per the plan RNAV -1 SID and STAR had been developed and implemented in the ten busiest terminal areas at Delhi, Mumbai, Kolkata, Chennai, Hyderabad, Bangalore, Trivandrum, Ahmadabad, Cochin including joint use airfield Goa operated by Indian Navy. RNAV 1/RNP 1 SID and STAR procedures are under development for other terminal areas also.

1.2 Since the time lines proposed in PBN Road Map of 2009 and 2011 were not met due to non-availability of Software tool and WGS-84 surveyed data, the revised timeline of the PBN implementation in India along with the current status was submitted to PBN ICG Meeting held in Bangkok in February 2016.

## 2. DISCUSSION

2.1 In 2011, **RNP APCH** were designed for Delhi and Shamshabad Airports, but due to data accuracy and integrity requirements as pointed out by DGCA India, the procedures were not pursued.

2.2 In 2013, based on the survey data of 2010, **RNP AR Procedure** RWY 32 Mumbai was designed and submitted to DGCA along with Simulator trial reports and ICAO DOC 9905 Compliance Checklist. The procedure has been cleared by DGCA for flight validation and the same has been intimated to Jet Airways, which was the lead Airlines for this project. A meeting of stakeholders, including representative of Boeing, to chalk out the modalities to proceed on the project was held in AAI, response is awaited.

2.3 In August 2015, **RNP APCH procedure RWY 23 and RWY 05 for Ahmadabad Airport**, based on the latest WGS-84 survey data, were designed and submitted to DGCA. After receiving the clearance, flight trial could be conducted for **LNAV & LNAV/VNAV** Procedures only for want of suitably equipped and approved aircraft for **LPV (SBAS)** procedures. The flight trial report was submitted to DGCA for approval for promulgation in Dec 2016. The approval was received in Feb 2017 and the **RNAV (GNSS)** procedure RWY 23 and RWY 05 along-with LNAV and LNAV/VNAV minima have been published effective 27<sup>th</sup> April 2017 AIRAC.

2.4 As per the availability of current WGS 84 survey data, the RNP APCH RWY 27 Procedure of Lucknow Airport was designed and submitted to DGCA for clearance for flight trial. This procedure has been validated on Simulator as directed by DGCA. The reports will be submitted to DGCA. Also the following 8 RNP APCH Procedures are designed and being reviewed before submission to DGCA-

- a) Rwy 28/10 Calicut Airport
- b) RWY 09 Lucknow Airport
- c) RWY 26 Belgaum Airport
- d) RWY 09 & RWY 27 Jaipur Airport
- e) RWY 09, RWY 14 and RWY 27 Mumbai Airport

2.5 India has developed in house capability to develop, validate and implement PBN procedures. There is a plan to develop 48 LNAV, LNAV/VNAV and LPV procedures by Dec'2018.

## 3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a. note the PBN Implementation status in India, and
- b. discuss any relevant matter as appropriate.

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