



International Civil Aviation Organization

**The Second Meeting of ICAO Asia/Pacific Performance based Navigation Implementation Coordination Group (PBNICG/2)**

Bangkok, Thailand, 11-12 June 2015

Agenda Item 3: Global and Regional PBN Updates and States' PBN Implementation Progress

**UPDATES ON PBN IMPLEMENTATION IN CHINA**

(Presented by China)

**SUMMARY**

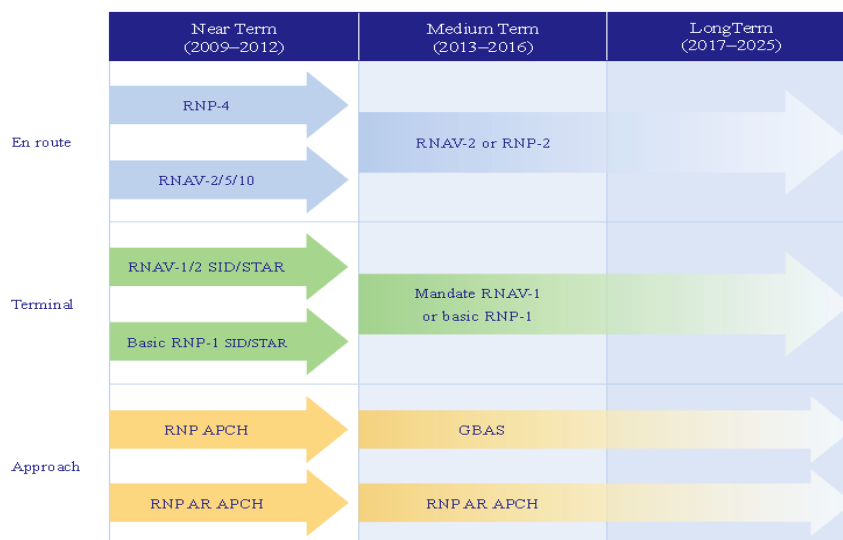
This paper provides information on the progress of PBN implementation following the PBN Implementation Roadmap of China, and proposes to share the useful suggestions for the PBN implementation.

**1. INTRODUCTION**

1.1 The ICAO 36<sup>th</sup> Assembly urged its Member States to develop national Performance Based Navigation (PBN) implementation plan by 2009 and to implement RNAV and RNP air traffic services (ATS) routes and terminal/approach procedures in accordance with the ICAO PBN concept laid down in the Performance Based Navigation Manual(Doc 9613).

1.2 In recent years, the total turnover of air transport in China maintains a double-digit annual growth, however, the available airspace resources of civil aviation is largely constrained, which poses huge pressure to the safety and efficiency of the entire system. Thus PBN technology becomes the common awareness, urgent request, and essential approach for China's civil aviation to explore the potentials of existing airspace resources, and improve flight operation safety and efficiency. Bearing this in mind, CAAC issued the "*PBN Implementation Roadmap*", which pinpointed the mid-term goal of fully adopting PBN operation by the end of 2016, the long-term goal of system integration between PBN and CNS/ATM by 2025, and their specific courses of action.

1.3 For the medium term of the PBN implementation plan 2013-2016, the CAAC plans to selectively apply RNP-10 and RNP-4 navigation specifications to certain oceanic operations and continental operations in western China. For certain busy routes, RNAV-2 or RNAV-5 navigation specifications are selectively applied, based on coverage of communication and surveillance signals, for reduced route spacing and higher utilization of airspace. The CAAC plans to implement RNAV 1 and RNP 1 for all airport terminal area operations within China by 2016 and, depending on operational requirements, to mandate the application of RNAV 1 or RNP 1 at certain airports. The CAAC plans to expand implementation of RNP APCH with Baro-VNAV in approach operations. By 2016, RNP approach capability will be available to all instrument runway ends. RNP AR approach procedures will be implemented at airports with operational requirements.



**Figure:** China PBN implementation phase

## 2. DISCUSSION

### PBN Implementation Status

2.1 Progress in Terminal. During past years, China has made a steady progress in terminal PBN implementation. By far, among 202 airports 145 airports have PBN procedure design (included RNP APCH/RNP AR procedures, accounts for over 71% of the total number of airports), and 66 airports have fully implemented PBN procedures. CAAC is speeding up the PBN implementation process in terminal area with the target of accomplishing 85% of airports PBN flight procedures and at least 50% of airports fully implemented by end of this year.

2.2 Progress in En-route. For en-route application, there are 61 PBN routes with the mileage of over 38,800km, accounting for 20% of the total mileage of air route in China by the end of May 2015, According to statistics, the current PBN routes contain 15 RNAV 2、4 RNAV 5、39 RNP 4 and 3 RNP 10 routes, which is approaching the medium term target of PBN en-route implementation. Among them, 47 air routes are permitting mixed navigational operations including PBN and conventional navigation, and the route designators have not been changed. It is for the purpose of stimulating aircraft operators to get operational approval from CAAC on one hand, and help flight crews and ATC getting familiar with en-route PBN practice on the other hand. It has been planned that North, Southwest and Northwest part of China will finish launch PBN operation by end of this year while Northeast, East and South part will accomplish PBN operation by August 2016.

### Advantages of PBN

2.3 Application and implementation of RNP AR flight procedures at 17 high plateau airports such as Lhasa have made it possible for civil flights to safely enter and exit airport with complex geography in Southwest part of China. Application of RNAV and RNP APCH technologies at large busy terminal areas in Beijing, Shanghai, and Guangzhou made it possible for more routes designed in limited airspace, effectively reducing conflicts of arrival and departure traffics and workload of Air Traffic controllers. Application of navigation specification like RNP 4 and RNAV 2 routes made it possible for flexible design of much more better flight paths, shortening flight distance while releasing more flight levels and improving flight economy. The advantages of PBN technologies are fully demonstrated and taken under complex airspace operation environment and special geographical conditions in China.

**3. ACTION BY THE MEETING**

3.1 The meeting is invited to:

- a) note the information contained in this paper; and
- b) discuss any relevant matters as appropriate.

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