International Civil Aviation Organization

The First Meeting of ICAO Asia/Pacific Performance based Navigation Implementation Coordination Group (PBNICG/1)

Beijing, China, 10-12 March 2015

Agenda Item 3: Global and Regional PBN Updates

Agenda Item 5: Implementations of PBN in Terminal Area

Agenda Item 7: Regional and Sub-regional Implementations of PBN in En-route Airspace

Agenda Item 9: Working Arrangements for PBN Region-wide implementations

PBN IMPLEMENTATION IN VIET NAM

(Presented by Viet Nam)

SUMMARY

This paper presents the current status and plans for PBN implementation in Vietnam

1. INTRODUCTION

ICAO Assembly resolution A36/23 urged all States 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). The new aviation challenges can be met by establishing new navigation system that enhances airspace capacity in line with the projected aviation demand, ensuring fuel saving and reduced environmental impact. The future demand on aviation operations in Asia and Pacific is also expected to vastly increase due to economic expansion as compared to other regions. PBN is now still the highest priority of aviation industry and has been included in ICAO ASBU concept. Block Module on "Optimization of approach procedures including vertical guidance"(B0-APTA), "Continuous Descent Operations" (B0-CDO) and "Continuous Climb Operations" (B0-CCO) are integral part of PBN implementation. Besides the terminal application, PBN has important role in Regional and International en-route operations by providing harmonized traffic flows across the globe.

2. DISCUSSION

Benefits of PBN

2.1 PBN offers a number of benefits over the sensor-specific navigation routes and procedures. Some of the benefits are being listed below:

- Reduced need to maintain sensor-specific routes and procedures, and their associated costs

- Avoids need for development of sensor-specific operations with each new evolution of navigation system. The present requirement of developing procedures with each new introduction is often very costly.
- Allows more efficient use of airspace in true harmony with the way in which RNAV systems are used
- Facilitates the operational approval process for operators by providing a limited set of navigation specifications intended for global use.
- For the pilots, the main advantage of using this system is that the navigation function is performed by highly accurate and sophisticated on-board equipment and thus allowing reduction in cock-pit workload and also increase in safety.
- For Air Traffic Controllers, the main advantage of aircraft using a RNAV system is that ATS routes can be straightened as it is not necessary for the routes to pass over locations marked by conventional navigation aids.
- RNAV based arrival and departure routes can complement and even replace radar vectoring, thereby reducing Approach and Departure Controllers' workload.

PBN Implementation Status in Viet nam

2.2 Viet nam cooperated with JICA – Japan to run the Project for the New CNS/ATM implementation in Vietnam and PBN is a key element of the Project.

2.3 Recognizing the benefits of PBN, Vietnam has established a national PBN Task Force to study of PBN technology, requirements for implementation and foster a cooperative approach among country aviation stakeholders in the implementation of PBN.

2.4 The national PBN Task Force is responsible for developing policy, implementation plans, and implementation standards for the deployment of PBN procedures and operations in Vietnam.

2.5 WGS-84 coordinates will have been surveyed by surveyors assigned by CAAV or provided by ACV, VATM at Phu Bai, Phu Quoc, Cam Ranh, Da Nang and Tan Son Nhat Airports, and been published in the AIP in accordance with the provisions of Annex 15.

2.6 There will be 65 PBN flight procedures in terminal airspace as below (in accordance with Vietnam PBN Roadmap), design of which is completed:

1. Phu Bai International Airport: 4 RNP1 SIDs/4 RNP1 STARs/1 RNAV (GNSS) Approach.
2. Phu Quoc Airport: 8 RNAV1 STARs/8 RNP1 SIDs/2 RNAV approaches.
3. Cam Ranh, Lien Khuong, Con Son Airports: 6 RNAV1/RNP1 SIDs (radar/non-radar) /6 RNAV1/RNP1 STARs (radar/non-radar) / 2 RNP approaches and/or RNP AR approaches if required, for each airport.

2.7 All aircraft operators registered in Vietnam will have received PBN operational certificate/approval whenever they apply.

2.8 CAAV will have 4 PBN flight procedure designers, who will also be capable to conduct oversight of flight procedure designs up to advanced level design, such as APV/Baro-VNAV and RNP AR approach.

1. VATM will have 10 PBN flight procedure designers up to advanced level design, such as APV/Baro-VNAV and RNP AR approach.

2. ACV and Vietnam Airlines will have 3 PBN flight procedure designers up to advanced level design, such as APV/Baro-VNAV and RNP AR approach.

3. Therefore, there will be 17 qualified PBN flight procedure designers in total in Vietnam C/P.

2.9 CAAV will have two flight validation officers capable of conducting PBN flight validation as well as inspection (calibration), including advanced level designs, such as APV/Baro-VNAV and RNP AR approach.

Vietnam may establish a regional cooperation mechanism with Cambodia and Lao PDR to use a newly established team of flight inspection services of VATM (ATTECH).

Challenges/Solutions

2.10 During the transition to a PBN environment, the typical challenges to be confronted are as follows:

a. Adoption of supporting Civil Aviation Regulations
b. PBN capability register and aircraft minimum equipment lists (MEL)
c. Integration of PBN capability into the ATM system
d. Safety monitoring of ATM system
e. Design and Implementation of PBN routes and procedure
f. Navigation database integrity and control
g. GNSS system performance and prediction of availability service
h. Continued involvement in CNS/ATM and PBN development
i. Adoption of Electronic Terrain and Obstacle Data
j. Aerodrome obstacle survey (WGS84)
k. Prediction of availability for a particular operation and aircraft
l. Decommissioning of existing aids
m. Education and training of personnel concerned

2.11 The avionics equipage, development of airspace concept, controllers training and other arrangements for airworthiness and operational approvals is a complex and time consuming process which will be undertaken Step-by-Step during transition to PBN. Therefore close liaison within all stake holders necessary to develop transition strategy would be required from service provider and operators perspective. To make transition from conventional navigation environment to Performance Based Navigation smooth and to support mixed operation during transition to accommodate non compliant aircraft, existing ground based navigation system will be retained. These navigation aids will also serve as reversionary mode in case of any failure. It is also required for low level general aviation aircraft operations. The possibility of withdrawal of existing ground based navaids infrastructure will only be considered in the long term period on the basis of on-board equipage, reliance on PBN implementation during first two terms, safety assessment and after consultation with all stake holders. Also conventional procedures will be used at the same time with PBN application until ICAO stipulates any mandatory requirements to suspend the conventional procedures.

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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