



International Civil Aviation Organization

**The Eighth Meeting of the Performance Based Navigation Task Force
(PBN/TF/8)**

New Delhi, India, 12 – 13 May 2011

Agenda Item 4: PBN Implementation Issues

FPP/COSCAP PBN UPDATE

(Presented by FPP/COSCAPs)

SUMMARY

This paper provides an update on the activities and progress of the ICAO Asia-Pacific Flight Procedure Programme (FPP) and Cooperative Development of Operational Safety and Continuing Airworthiness Programmes (COSCAPs) for consideration by the meeting.

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)
- GPI-7 Dynamic and flexible ATS route management
- GPI-10 Terminal area design and management
- GPI-11 RNP and RNAV SIDs and STARs
- GPI-21 Navigation systems

1. **INTRODUCTION**

1.1 The purpose of this Information Paper is to provide an update on the activities and progress of the ICAO Flight Procedure Programme (FPP) and COSCAPs in the support being provided to Member Administrations related to PBN Implementation.

2. DISCUSSION

APAC FPP Background

2.1 The FPP officially came into existence on January 26, 2010, with the FPP Office in Beijing starting operations shortly thereafter, in March 2010. To date, twenty-three States have joined the FPP, eleven as Active Participating States/Administrations, including the host State China, and twelve as User Participating States. It should be emphasized that any State in the region can still join the FPP at any time either as an Active Participating State or a User Participating State, and all States are encouraged to do so.

2.2 **FPP Phase 2.** The FPP Steering Committee in its second meeting, held 15-16 December 2010 in Bangkok, agreed on the necessity to continue the FPP past the initial three years for which it was established. It was agreed that Phase 2 for the FPP will start January 1, 2013 and run until December 31, 2017. In connection with the establishment of Phase 2, it was agreed that preparations must be made to ensure there is a host State for the FPP during Phase 2. China has declined to commit to hosting the FPP in Phase 2. The FPP Steering Committee decided to hold a FPP Phase 2 Planning Meeting, 31 May – 1 June, in Bangkok, open to all States in the Region. The purpose of this meeting will be to decide, for Phase 2, on the scope of activities of the FPP, possible funding arrangements and criteria and process for deciding on a host State. A request for proposals from States to host the FPP for the five years of Phase 2 will be sent out after the Planning Meeting. The final decision on a host State for FPP Phase 2 will be made at the 3rd Meeting of the FPP Steering Committee, tentatively planned for December 2011 in Thailand.

FPP PBN Update

2.3 **PANS OPS Initial Course.** The second FPP PANS OPS Initial Course was very successfully conducted from 3-28 January 2011. Joe Lam, the FPP Chief of Training and Arif Mumtaz from Pakistan, were the instructors. The next Initial Course is scheduled for 4-29 July 2011 in Beijing. The FPP is planning to offer two courses per year, as long as demand warrants it.

2.4 **PBN Procedure Design Course.** The second of these courses, which teach PBN procedure design criteria, except for RNP AR, was held 15-31 March in Beijing. The FPP is planning to offer two PBN Procedure Design Courses per year, as long as demand warrants it.

2.5 **RNP AR Procedure Design Course.** The FPP is holding an RNP AR Procedure Design Course 18-21 April 2011, in Beijing. The FPP will plan to offer the RNP AR Procedure Design Course as needed, but probably not to exceed once per year.

2.6 **PBN Airspace Concept Workshops.** In February 2011, the FPP held a PBN Airspace Concept Instructors Workshop in Singapore to develop a pool of instructors/facilitators to assist the FPP. CAA Singapore kindly hosted the workshop at the Singapore Aviation Academy and provided financial assistance to make the Workshop possible. As a result of this instructor workshop, the FPP is now able to offer PBN Airspace Concept Workshops in the region on request. The FPP anticipates that this workshop can be used by a State to bring all the stakeholder members of their Airspace Design Team up to a common level of understanding regarding PBN and PBN airspace design, before they begin the PBN airspace design process in a terminal area in their State. The FPP will hold an Airspace Concept Workshop in Hong Kong, hosted by the Hong Kong CAD, 22-25 November 2011. This workshop will be open to all States in the region, and will accommodate up to 45 participants. There are two other workshops being planned for specific States for 2011. If there are States that would be interested in having a PBN Airspace Concept Workshop in their State, they should contact the FPP Manager.

2.7 **Procedure Design On-the-Job Training (OJT).** Many States do not have the expertise available, once their procedure designers are trained, to conduct OJT. The FPP offers OJT in 3-week blocks, based on instructor resource availability. Trained procedure designers are expected to come to Beijing with all the required data, maps, etc. for a project in their country, to work on that project under supervision of an instructor. Maximum OJT trainees will be 3 at one time. States should contact the FPP Manager to request and schedule this type of training. The FPP conducted OJT for two trainees in November 2010. Three States have tentatively scheduled FPP OJT so far for 2011.

APAC COSCAP Background

2.8 The COSCAPs are dedicated forums for cooperation and coordination in matters related to flight safety, bringing together well-developed and smaller participating civil aviation administrations. Each COSCAP operates independently under the direction of a steering committee comprised of the Directors General of participating Civil Aviation Authorities, ICAO and other organizations and companies interested in supporting aviation safety.

2.9 There are three COSCAPs in the Asia-Pacific Region. COSCAP South Asia, with members India, Bangladesh, Pakistan, Bhutan, Nepal, Maldives and Sri Lanka, is the senior member of the Asia-Pacific COSCAPs, currently operating under its third five-year phase. COSCAP South East Asia is comprised of Cambodia, Hong Kong (China), Macao (China), Indonesia, Lao PDR, Malaysia, Myanmar, Philippines, Singapore, Thailand, Viet Nam, Brunei Darussalam and Timor-Leste was established in 2001 and, finally, COSCAP North Asia serving China, the Republic of Korea, the People's Democratic Republic of Korea and Mongolia was established in 2003 and is in its second five-year phase.

COSCAP PBN Update

2.10 The APAC COSCAP programmes have been very active with respect to providing support to Member Administrations related to PBN Operational Approval. A PBN Model Regulation and PBN Operational Approval Handbook have been developed by the COSCAP programmes and complements/supplements the material contained in the ICAO PBN Manual (DOC 9613). These Model documents were forwarded to States in August 2010 and can be readily adapted (if required) to enable States and air operators to move forward with PBN Operational Approvals.

2.11 The APAC COSCAP programmes have also developed PBN Operational Approval Courses which have been conducted in Singapore (26 – 30 April 2010 – regional programme); Brisbane, Australia (7 – 11 June 2010 – regional programme); Bangkok, Thailand (30 – 31 August 2010 – regional programme); China (6 – 17 September 2010); Bangkok, Thailand (1 – 10 November 2010 – regional programme); and New Delhi, India (22 November – 3 December 2010). Additional courses will be conducted in Ho Chi Minh, Vietnam (16 – 20 May 2011); Manila, Philippines (6 – 10 June 2011); and Bangkok, Thailand (15 – 19 August 2011 – regional course). Boeing has provided funding support for all the COSCAP costs associated with these programmes.

FPP/COSCAP PBN Implementation Workshops

2.12 At the 37th Assembly, in resolution A37-11, ICAO urged all States to develop and implement a PBN Implementation Plan with certain milestones established for implementation. While many States have developed PBN Implementation Plans, difficulties have been encountered related to the execution of these plans.

2.13 The FPP/COSCAP programmes have already provided considerable training and the focus now is on supporting States' implementation of PBN through the provision of in-State PBN Implementation Workshops. While the first day of the Workshop includes presentations as a review of PBN Requirements and Implementation, the remainder of the Workshop focuses on exchange of information and discussions to support implementation of PBN in that particular State. All stakeholders (CAAs, ANSPs, air operators, etc.) are invited to participate.

2.14 The goal of the PBN Implementation Workshop is to facilitate development of procedures and approval of operations; provide technical advice to stakeholders in order that they can meet their obligations and, develop an action plan and timelines for initial implementation. Outcomes from the many Workshops will be tracked by the ICAO FPP programme and additional support provided by FPP/COSCAP as required.

2.15 PBN Implementation Workshops have been conducted to date in Indonesia (7 – 11 February 2011); Brunei Darussalam (7 – 10 March 2011); Sri Lanka (24 – 29 March 2011); Nepal (31 March – 1 April 2011) and Mongolia (4 – 7 April 2011). Additional PBN Workshops are scheduled for Myanmar (13 – 16 June 2011), Lao PDR (20 -22 June 2011), Bangladesh (22 – 24 August 2011) and Republic of Korea (24-28 October 2011).

2.16 In addition to COSCAP and FPP support, Boeing, IATA, and/or Airbus have provided financial and/or technical support associated with these Workshops and subsequently towards some of the expenses related to the implementation of the outcomes.

2.17 Attachment I provides an example of the Recommendations/Outcomes from a very targeted PBN Implementation Workshop, in this case the one conducted in Kathmandu, Nepal, 31 March – 1 April 2011. Kathmandu is a terrain challenged airport and requires the development of an RNP AR APCH in order to effectively implement PBN requirements. Of particular note, there were about 65 participants at the Workshop and almost all of the 29 air operators flying to/from Kathmandu participated. A survey was conducted during the workshop, which revealed that 15 of these air operators have RNP AR APCH capable aircraft, and are operating into Kathmandu on 161 flights per week (67%). Another 7 air operators are operating into Kathmandu on aircraft that can be readily upgraded to be capable of RNP AR approaches (45 flights, 19%). In essence, within 2 years, following the timeline decided during the workshop, 86% of the international flights into Kathmandu could be utilizing the RNP AR APCH. This could easily result in Kathmandu becoming the most widely flown RNP AR APCH at a terrain challenged airport in the world.

2.18 Attachment II provides an example of the Recommendations/Outcomes from a more typical PBN Implementation Workshop, in this case the one conducted by the FPP and COSCAP North Asia, with the assistance of AEROTHAI, in Ulaan Baatar, Mongolia, 4 – 7 April 2011.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information in this IP as States develop PBN implementation plans; and
- b) note that States are encouraged to seek the support of the FPP and Asia COSCAPs as required to support the development, amendment, or implementation of their PBN Plan.

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Attachment I

**PBN Implementation Workshop
Kathmandu, Nepal
31 March – 1 April 2011**

Outcomes and Recommendations

The workshop identified the following tasks that need to be accomplished in order to meet the short term goals of implementing the RNP AR Approach to Runway 02 at Kathmandu. For each organization that has some responsibility, the tasks are listed in order of priority.

Civil Aviation Authority of Nepal (CAAN):

- 1) Incorporate enabling PBN regulations in the Nepal Civil Aviation Regulations, based on the COSCAP PBN Model Regulation, by 30 April 2011. COSCAP to provide support if requested.
- 2) Adopt COSCAP PBN Operational Approval Manual as Nepal guidance by 30 April 2011.
- 3) Implementation of RNAV (RNP) Rwy 02 approach by 15 December 2011:
 - a. Provide written notice to Qatar Airways that CAAN will approve an ICAO-compliant Data survey provided by a combined CAAN/Department of Survey representative/Quo Vadis team for the purpose of developing the VNKT RNAV (RNP) Rwy 02 approach procedure
 - b. Consent from CAAN to Qatar Airways to proceed with RNP AR APCH procedure design to KTM by 30 April 2011. CAAN will also agree to not unreasonably withhold the approval of the RNP AR Approach procedure design.
 - c. CAAN to install and authorize real-time altimeter setting reporting at KTM airport by 31 May 2011 for use by both tower and approach controllers
 - d. Target time periods for CAAN approvals: Data Survey- TBD, Conceptual Design – Design Decision meeting but not to exceed 10 days, Final Procedure – 3 weeks, but not to exceed 2 months
 - e. Procedure Design Decision (Stakeholder) meeting to be arranged by CAAN before 31 July 2011
 - f. CAAN to develop amendment to Manual of ATS Standards to address any changes needed as a result of implementation of the RNP AR APCH.
 - g. CAAN to arrange small aircraft with at least TSO C129 GPS installed, for flight validation purposes, as necessary.
- 4) CAAN to send Flight Operations Inspector to COSCAP PBN Operational Approval Course, 15-19 Aug 2011, in Bangkok
- 5) CAAN to send procedure designers to FPP RNP AR Procedure Design Course, 18-21 April 2011, in Beijing (If unable, move to Phase 2 actions).
- 6) CAAN to provide update to all stakeholders by email, including international operators, at conclusion of the Design Decision meeting, and on final approval of the procedure by the CAAN

ICAO FPP and COSCAP:

- 1) COSCAP/FPP will provide support to the CAAN for procedure validation, including ground and flight validation, and approval of the procedure.

OPERATORS:

- 1) Qatar Airways or Airbus will provide their simulator for flight validation at no cost
- 2) Fly Dubai will provide their simulator for flight validation in Boeing 737-NG at no cost. Simulator awaiting RNP AR modifications.
- 3) KAL may provide their 777 simulator for flight validation
- 4) Qatar, Air Arabia, Fly Dubai, Etihad Airlines, Jet Airways will begin preparations immediately, and submit their application to their authority for RNP AR APCH operational approval by 31 August 2011
- 5) KAL, Gulf Air, Druk Air, Bahrain Air and Thai will consult with management on time line for RNP AR APCH operational approval application.

AIRBUS/QUO VADIS:

- 1) Airbus/Quo Vadis will provide free of charge to the CAAN and all operators a procedure design, including chart and coding for an RNP AR APCH to Runway 02 at KTM, compliant with ICAO Doc 9905, with any deviations identified and justified.
- 2) Airbus/Quo Vadis to provide a letter as soon as possible but no later than 14 April 2011 to CAAN confirming the “free of charge” aspects of their offer as detailed in 1) above.
- 3) Airbus/Quo Vadis will evaluate the ATC training needs of the CAAN, in coordination with the CAAN, and in the context of implementation of the RNP AR APCH in the KTM terminal area and provide the training (one 3-day session) to ATC Managers and trainers. To be completed no later than 15 November.

*Design Decision Meeting: Meeting to agree to the conceptual design and sign off on that decision by all parties

Attachment II

**PBN Implementation Workshop
Ulaanbaatar, Mongolia
4 – 6 April 2011**

OUTCOMES AND RECOMMENDATIONS

The workshop identified the following tasks that need to be accomplished in order to meet the short term goals of implementing PBN in Mongolia. For each organization that has some responsibility, the tasks are listed in order of priority.

Civil Aviation Authority of Mongolia (MCAA):

REGULATION AND FLIGHT STANDARDS

- 7) MCAA to adapt COSCAP PBN Operational Approval Manual to MCAA requirements and adopt as Mongolia guidance by June 30, 2011.
- 8) Incorporate enabling PBN regulations in the Mongolia Civil Aviation Regulations, based on the COSCAP PBN Model Regulation, by December 31, 2011. DG, MCAA to issue interim order or regulation by June 30, 2011 pending approval of the final regulation. COSCAP to provide support if requested.
- 9) MCAA to act on MIAT Operational Approval application by 30 September 2011.

INSTRUMENT FLIGHT PROCEDURES

- 1) Implement RNP approach (LNAV and LNAV/VNAV) and RNP 1 STAR(s) to ZMUB Rwy 14 and RNP 1 SID(s) from Rwy 32, by 12 January 2012:
 - a. Target dates for procedure design actions: Data Survey- 30 June 2011, Conceptual (draft) Design – 31 August 2011, Final Procedure – 30 September 2011, Validation – 31 October 2011
 - b. MCAA to develop amendment to Manual of ATS Standards to address any changes needed as a result of implementation of the SIDs, STARs and RNP APCH, along with development of associated training for air traffic controllers, by 31 October 2011.
- 2) MCAA PBN Implementation Team requests MCAA provide electronic terrain and obstacle data and maps of sufficient scale (more accurate than 1:50,000) in electronic or paper format that can be used as necessary for PBN procedure design purposes. This is considered a critical safety issue for the approach procedure design.
- 3) MCAA to evaluate whether the existing navaid infrastructure will support RNAV 5 on the A575 route, by June 30, 2011.
- 4) If feasible, and MIAT agrees to obtain approval and use the procedure, the MCAA will start process for implementation of an RNP AR APCH to ZMUB Rwy 32. Decision by 1 September 2011.

TRAINING

- 1) MCAA to send flight operations inspector personnel to COSCAP PBN Operational Approval Course in Bangkok, 15-19 August 2011.
- 2) MCAA to send four procedure designers, two at a time, to FPP Procedure Design OJT. First pair tentatively scheduled for August 2011.
- 3) MCAA to send four personnel to FPP PANS OPS Procedure Design Initial (July 2011) Course in Beijing.
- 4) MCAA to send procedure designers to FPP PBN Procedure Design Course, October 2011, in Beijing.
- 5) MCAA to send personnel to training for flight validation, when available.

INFRASTRUCTURE

- 1) MCAA should join the regional RAIM prediction system being developed by AEROTHAI.
- 2) MCAA should establish 3 GNSS ground monitoring stations by June 2012 and procure one mobile GNSS ground monitoring station.

ICAO FPP AND COSCAP:

- 6) FPP will conduct initial feasibility study for RNP AR APCH to ZMUB Rwy 32, using available data to be provided by MCAA, by 31 July 2011.
- 7) FPP will provide support to the MCAA for procedure validation, including ground and flight validation, on request.

OPERATORS:

- 1) MIAT will provide aircraft RNP AR capability for their 737-800's, and if any modifications will be necessary for approval, by 30 April 2011.
- 2) MIAT requests MCAA provide electronic terrain and obstacle data and maps of sufficient scale (more accurate than 1:50,000) in electronic or paper format that can be used for detailed engine out missed approach and SID development. This is considered a critical safety issue by the airline.
- 3) MIAT to consider sending one person to COSCAP PBN Operational Approval Course in Bangkok, 15-19 August 2011 and one qualified person to FPP PBN Procedure Design Course (October 2011).
- 4) MIAT to apply for RNP 1 and RNP APCH (LNAV and LNAV/VNAV) operational approval by 31 August 2011.
- 5) Blue Sky to consider applying for RNP 1 and RNP APCH (LNAV) operational approval by 31 December 2011.