



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**SIXTH MEETING OF THE PERFORMANCE BASED NAVIGATION
TASK FORCE (PBN/TF/6)**

Hong Kong, China, 3 – 5 February 2010

Agenda Item 2: Global PBN Implementation – Update

PBN UPDATE

(Presented by the Secretariat)

SUMMARY

The purpose of this Working Paper is to provide an update on PBN initiatives being worked or coordinated by the ICAO PBN Programme Office in Montreal.

Updates are provided on the Global PBN Task Force (GPBNTF) and Panel and Study Group activity.

Reference:

This Working Paper relates to Strategic Objectives:

Strategic Objective A: *Safety*

Strategic Objective C: *Environmental Protection*

Strategic Objective D: *Efficiency*

1. INTRODUCTION

1.1 The purpose of this Working Paper is to provide an update on PBN initiatives being worked or coordinated by the ICAO PBN Programme Office in Montreal. This concerns the Global PBN Task Force, recent outcomes of Panels, Study groups and taskforces on work related to PBN and new manuals or changes that are published or about to be published.

2. DISCUSSION

2.1 Global PBN Task Force

2.1.1 At the invitation of ICAO and IATA, representatives of States, industry and international organizations have worked together as the Global PBN Task Force (GPBNTF). The objectives are to build upon the global and regional structures, which have already been put in place for PBN implementation, and to produce tools and enablers to facilitate and expedite

the work. The TF is divided into Teams to work on specific plans and deliverables. Several activities are currently underway and this paper provides some insight into those activities.

2.1.2 **Promotion Team.** The Promotion Team has been producing and sending out the PBN Newsletter, *Waypoints* every quarter. Issues of *Waypoints* are available on the PBN web site at, <http://www2.icao.int/en/pbn/Pages/default.aspx>.

2.1.3 **Implementation Support Team (IST).** The IST produced a consolidated model action plan and several model action plans directed at the enroute, terminal, and approach phases of implementation. These model action plans are available on the PBN web site, <http://www2.icao.int/en/pbn/Pages/default.aspx>. The IST had revised the plans based on several inputs and a new version will be presented at this meeting. The Implementation Support team is also in the process of developing guidance for States on the implementation of GNSS.

2.1.4 **PBN Airspace design workshops.** Four workshops are planned for 2010, the first one to be held in Bangkok, 19-22 April, 2010. The objective of these workshops is to familiarize participants with airspace design as it relates to implementation of Performance Based navigation.

2.1.5 **Operational Approval Manual.** In a cooperative effort with ICAO COSCAP-SEA and the Australian CASA, and with input from operational approval experts in the region and from FAA, the initial draft of an Operational approval manual has been completed. The draft operational approval guidance manual will be reviewed during this TF meeting. The next step will be to develop a training course for ops approval based on the manual. The first of these operational approval training courses is tentatively planned for the APAC region sometime shortly after the Airspace Design Workshop.

2.1.6 **Implementation Management (GO) Team.** The GO Team is preparing implementation activities that would develop regional pockets of knowledge and expertise in various States, and could serve as an example of successful implementation to other States in the region. The Implementation Management Team is presently working on a trial GO Team visit to South Africa. After getting The GO Team ready they will follow the Airspace and Ops Approval Workshops in four other regions of the world throughout 2010.

2.2 **Panels and Study Groups**

2.2.1 **Instrument Flight Procedures Panel (IFPP).** The next IFPP amendments to PANS OPS and annexes will be reviewed by the ANC on 18 February 2010. The PANS OPS amendments should be applicable in November 2010. A summary of these amendments follows.

2.2.1.1 **Helicopter flight procedures.** The amendment proposals regarding helicopter procedures provide for Point-in-Space (PinS) helicopter “Proceed visual flight rules (VFR)” and “Proceed Visually” approach procedures as well as heliport route departures with direct visual segments based on RNAV 1 and Basic-RNP 1 navigation specifications. The amendment proposals include pilot, procedure design and charting requirements and affect Annex 4 and PANS-OPS, Volumes I and II. As a result of preliminary review by the ANC it is expected that this material will most likely have to be sent back to the Panel for some additional review. Consequently the helicopter portions of the PANS-OPS and Annex 4 amendments will likely not be applicable until November 2011.

2.2.1.2 **Quality assurance.** The amendment proposal to PANS-OPS, Volume II regarding quality assurance explains the instrument flight procedure process and documentation requirements in more detail. It also clarifies the provisions for qualifications of flight validation pilots by providing more defined minimum qualifications.

2.2.1.3 **Alignment of RNAV Holding criteria with PBN.** The proposed amendment to PANS-OPS, Volume I pertains to RNAV holding requirements and is consequential to existing PANS-OPS, Volume II design criteria, and seeks alignment with the PBN concept. It furthermore removes some impracticable requirements, incorporated before the PBN concept materialized, that cannot be coded into the navigation database.

2.2.1.4 **Use of SBAS equipment for flying APV/Baro-VNAV procedures.** The amendment proposals to PANS-OPS, Volume I concerning the use of SBAS equipment to fly APV/Baro-VNAV procedures are consequential to existing PANS-OPS, Volume II design criteria. In addition, in the process of developing these proposals, a need was found for a correction to the PANS-OPS, Volume II criteria related to this subject.

2.2.1.5 **Aeronautical database and procedure design interface issues.** The amendment proposals relate to PANS-OPS, Volume II design criteria which include instructions to the procedure designer to allow for better interpretation of the design criteria by navigation database encoders. It affects both conventional criteria as well as RNAV criteria. These types of amendments are part of an ongoing review by the panel to ensure complete alignment of the criteria with the navigation database capabilities. To ensure close coordination with industry, and this topic in particular, ARINC has agreed to participate as a member of the IFPP.

2.2.1.6 **Flight Validation.** The International Committee on Airspace Safety and Calibration (ICASC) developed initial drafts of a new volume or volumes to be incorporated in the Quality Assurance Manual for Flight Procedure Design, Doc 9906, with Flight Validation guidance and Flight Validation Pilot Training requirements. The IFPP reviewed this work at its meeting in September and it is expected that a final draft of this material will be available for review by the IFPP at its March 2010 meeting. If approved, the new guidance will be available as an advance copy from ICAO shortly thereafter. To ensure close coordination with industry and experts in this field, and this topic in particular, ICASC has agreed to participate as a member of the IFPP.

2.2.1.7 **IFPP/6 Meeting.** The sixth meeting of the IFPP will be hosted by AEROTHAI 15-26 March 2010, in Bangkok, Thailand.

Separation and Airspace Safety Panel (SASP). The Separation and Airspace Safety Panel Working Group of the Whole during its 16th meeting held last November completed or advanced work on the following topics.

- Finalized details of separation minima to be used between PBN-approved aircraft in terminal operations. Barring unforeseen circumstances these minima will be published in the PANS ATM this coming November.
- Completed additional work on a PANS ATM amendment proposal that will allow use of 3 miles separation between aircraft under surveillance with ADS-B or MLAT systems. Planned effective date of November 2012
- Finalized work on an Annex 2 amendment proposal to fine tune SARPS related to variations in airspeed in controlled airspace. Planned effective date of November 2012.
- Completed initial work on a PANS ATM amendment proposal to allow the use of the In-Trail Procedure (ITP) between aircraft wishing to climb/descend using ADS B to identify relevant aircraft. Planned effective date of November 2012.
- Published Circular 319 “A Unified Framework for Collision Risk Modelling in Support of the Manual on Airspace Planning Methodology for the determination of Separation Minima (Doc 9689)”.

Future work will continue to focus on expanding the application of new technologies in the cockpit and space to separation minima.

2.2.2 **Performance Based Navigation Study Group (PBN SG).** The PBN SG met in late September and worked on the next phase of PBN. Decisions were made on the direction to take with respect to new navigation specifications. Included in those decisions were:

- Development of a navigation specification for SBAS and its inclusion in the PBN Manual;
- Development of an RNP 2 nav spec for enroute continental application, including remote continental;
- Application of RF turns outside final approach in RNP APCH, advanced RNP and Basic-RNP 1 nav specs; and
- Development of an Advanced RNP navigation specification

An amendment to the PBN Manual is expected to be ready by Fall 2010, incorporating all or most of the work shown above.

2.2.3 **AIS/AIM Study Group.** The ANC approved an amendment to Annex 15 relating to Electronic Terrain and Obstacle Data (ETOD) on 28 January 2010. It was agreed that ETOD for Area 1 and 4 is required, ETOD for Area 2, with exceptions will be a recommended practice. Subcomponents of Area 2 will become a Standard, to be required where obstacles and/or terrain are a hazard for air navigation or penetrate specified identification surfaces.

2.3 **Documents**

2.3.1 **RNP AR Procedure Design Manual (Doc 9905)**

2.3.1.1 The Required Navigation Performance Authorization Required (RNP AR) Procedure Design Manual and accompanying spreadsheets has been completed and published.

2.3.2 **Quality Assurance manual (Doc 9906)**

2.3.2.1 The Quality Assurance manual for the procedure design process has been completed. A new volume for ground and flight validation is currently under development. Coordination between IFPP and NSP is under way to move material related to validation from Doc 8071 to the new manual.

2.3.3 **Continuous Descent Operations (CDO) manual.** The purpose of this Manual is to standardize and harmonize the development and implementation of Continuous descent operations (CDO). To achieve this, airspace and instrument flight procedure design and air traffic control techniques should all be employed in a cohesive manner. This will then facilitate the ability of flight crews to use in-flight techniques to reduce the overall environmental footprint and increase the efficiency of aircraft operations.

2.4 **Flight Procedure Programme (FPP).**

2.4.1 **APAC FPP Update.** In response to the State Letter inviting States to express their intent to participate in the FPP, sent in June 2009, and subsequent follow-up sent in July, Australia made a proposal that a “Core group” of States fund the programme budget and allow all States to use the “Free Services” of the FPP. This Core Group of States would be members of the Steering Committee, setting priorities, working with the FPP manager on the work programme and decide on budget issues. This proposal was discussed at a side meeting at APANPIRG/20 and based on positive

feedback from the group the decision was made to adopt the proposal. In November 2009 the State Letter was sent out inviting States to participate in the FPP as either an Active Participating State (Core Group) or User State. The contribution by each Active Participating State was set at \$16,000 to facilitate budgeting and approval of States' participation. To date, thirteen States have joined the FPP, eight as Active Participating States/Administrations, including the host State China, and five as User States. ICAO received the key State signature needed to proceed with opening of the FPP office in Beijing on 26 January 2010. As a result, it is expected that the FPP office will now be able to open in March 2010. 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 State, and all States are encouraged to do so.

2.4.2 **Contributions to the FPP.** The FPP as it has developed would not have been possible without the generous contributions of a number of States and organizations. In addition to the CAAC, which has offered to host the FPP office and provide substantial resources and personnel, the following have contributed to fill a critical need in the programme:

- FAA is funding the FPP manager position
- French DGAC/ENAC is providing their GeoTITAN procedure design software
- Airbus is providing the funding for the substantial start-up installation and middleware costs associated with introduction of the GeoTITAN software
- Hong Kong, China is providing a procedure design instructor
- Jeppesen will provide aeronautical data to populate the FPP database
- Other States and organizations have offered or are considering offering additional support to the FPP in the future

2.4.3 **Immediate plans.** The initial few months after the APAC FPP starts will be devoted to developing the FPP processes, training and development of FPP staff and developing and conducting a PANS OPS initial course (tentatively April 2010) and PBN Procedure Design Course (tentatively June 2010).

2.4.4 **Future FPP.** Plans should get underway this quarter for establishment of an FPP for Africa.

3. ACTION BY THE MEETING

3.1 The meeting is invited to review and consider the information in this WP as they develop plans for implementation of PBN in their State.

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