INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE SEVENTH MEETING OF THE PERFORMANCE BASED NAVIGATION TASK FORCE (PBN/TF/7)

BANGKOK, THAILAND
1 – 3 SEPTEMBER 2010

The views expressed in this Report should be taken as those of the PBN/TF and not of the Organization.

Adopted by the PBN/TF
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PART I - HISTORY OF THE MEETING

1. Introduction

1.1 The Seventh Meeting of the Performance Based Navigation Task Force (PBN/TF/7) was held in Bangkok, Thailand from 1 to 3 September 2010 at the ICAO Asia and Pacific Office.

2. Attendance

2.1 The PBN/TF/7 Meeting was attended by 58 participants from Australia, Cambodia, Hong Kong China, Indonesia, Japan, Lao PDR, Maldives, Mongolia, Myanmar, New Zealand, Republic of Korea, Pakistan, Singapore, Thailand, IATA, IBAC, IFALPA, Flight Procedure Programme, COSCAP-SEA, ICAO and the Industry.

2.2 List of participants is at **Appendix A** to this Report.

3. Opening of the Meeting

3.1 On behalf of the ICAO Asia Pacific Office, the Secretary PBN Task Force, welcomed the participants to the Seventh Meeting of the Asia Pacific Performance Based Navigation Task Force.

3.1.1 He was encouraged to see the tremendous response not only from the member States and Administrations but also from International Organizations and the industry.

3.1.2 The Secretary thanked all the participants for their continued support and contribution, and acknowledged the direction provided by Mr. Ian Mallett, Chairman PBN Task Force and Mr. Noppadol Pringvanich, Rapporteur Regional PBN Implementation Plan Sub-group in guiding the work of the Task Force. He also thanked Mr. Erwin Lassooij, ATM TO, PBN Programme and ICAO Headquarters for their support and involvement in the Asia Pacific PBN Task Force activities.

3.1.3 The Secretary expressed concern that of the 40 States/Administrations in the Asia Pacific region only 28 States/Administrations had nominated their Focal Points despite repeated reminders. In addition, not all States had submitted their PBN Implementation Plan. Highlighting the resource limitations in some of the Asia Pacific States, the Secretary stated that these States may require assistance and guidance to ensure a harmonized and coordinated transition to PBN at the regional level. The Secretary urged the Task Force to address this issue and look for workable solutions.

3.2 The PBN Task Force Chair, Ian Mallett, welcomed the attendees to the Seventh Meeting of the PBN Task Force.

3.2.1 He noted the considerable amount of work was being done across the world on PBN and acknowledged that PBN would be a work in progress for quite some time to come. The Chair informed the participants that the APANPIRG CNS/MET meeting had recommended that the Task Force continue for 3-5 years with its principle focus on implementation, education and training. He reminded the Task Force members of the forthcoming Assembly and DGCA meetings, the various material on PBN that would be presented at these meetings and the need for State representatives to support the various PBN papers including the proposed amendment to the PBN Resolution A36-23.

3.2.2 The Chair appreciated the efforts of the ICAO Secretariat in setting up the meeting and providing continued support.

4. Officers and Regional Office

4.1 Mr. Ian Mallett, Head of Aerodromes and CNS/ATM Section, Civil Aviation Safety Authority of Australia, chaired the meeting.

4.2 Mr. Noppadol Pringvanich, Engineering Manager, AEROTHAI served as Rapporteur for the PBN Task Force Meeting.

4.3 Mr. Erwin Lassooij, ATM TO, PBN Programme, ICAO Headquarters Montreal provided technical guidance to the meeting.

4.4 Capt. Fareed Ali Shah, Regional Officer Flight Safety, served as Secretary to the meeting.

4.5 Mr. Li Peng, Dr. Sujan K. Saraswati and Mr. Syed Yousuf Abbas supported the meeting.

5. Documentation and Working Language

5.1 The working language of the meeting as well as all documentation was in English.

5.2 Twelve (12) Working Papers and Five (5) Information Papers were presented at the meeting. A list of papers is included at **Appendix B** to this Report.

PART II - REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of Agenda

1.1 The following Agenda was proposed for adoption by the meeting:

Agenda Item 1:	Adoption of Agenda
Agenda Item 2:	Global PBN Implementation – Update
Agenda Item 3:	APAC Region PBN Implementation
Agenda Item 4:	PBN Implementation Issues
Agenda Item 5:	State / Industry Presentations
Agenda Item 6:	Tasks List Review
Agenda Item 7:	Feasibility of Establishing a regional RAIM Prediction System
Agenda Item 8:	Update of Task Lists
Agenda Item 9:	Any Other Business 9.1 Hosting of ICAO Asia Pacific PBN Implementation Seminar in 2011.
Agenda Item 10:	Date and Venue for Next Meeting

1.2 The Provisional Agenda was adopted. The Final Agenda is placed at **Appendix C.**

Agenda Item 2: Global PBN Implementation – Update

2.1 **Presentation of Working Paper 2 (WP/2): PBN UPDATE**. WP/2 a global PBN Update was presented by Mr. Erwin Lassooij, the PBN Programme Mmanager from ICAO HQs. Main highlights of the paper included the following:

a) The PBN Airspace design workshops have started and appear to be very successful; and the interactive nature of the workshop ensure a very good comprehension of the tasks and principles required for implementing PBN into an airspace. As technical reference, a PBN airspace design manual is being developed;

b) Operational approval appears to be one of the main elements for which guidance is still missing on a global level. Without aircraft being approved for PBN, the PBN routes cannot be flown. COSCAP has developed a handbook and is providing training courses for Asia. On a global level, the PBN manual will be amended to include Operational approval. A training course is under development as well;

c) The CDO manual is completed in draft and the final document can be expected in one month;

d) A State letter was circulated, providing States guidance on an updated RNP APCH navspec that include SBAS approach requirements; and

e) The PBN SG is in the process of finalizing amendments to the PBN manual that will include RNP0.3, advanced RNP, and the RF legs for RNP as well as changes to the RNP AR navspec to include departures.

2.1.1 The meeting noted with appreciation the work being done by ICAO and the industry in educating personnel and creating greater awareness at the global level on PBN matters. The meeting thanked ICAO for providing a global update to the PBN Task Force on a regular basis.

2.2 **Presentation of Working Paper 7 (WP/7): Performance-Based Navigation – The Implementation Challenge.** This paper, which was also presented by Mr. Erwin Lassooij, provides the essence/body of the upcoming Assembly paper on PBN. The paper includes an update on the achievements on PBN. It also indicates that the progress of PBN is slow, both due to a lack of expertise in many States as well as lack of resources in ICAO. The paper also highlights the need for implementing RNP APCH LNAV approaches if Approaches with vertical guidance (APV) cannot be implemented. Every approach chart for APV should also have a minima line for LNAV to accommodate aircraft that cannot fly APV.

2.2.1 The meeting noted the developments in the implementation of PBN and supported the proposed action items.

Action Item 7/1: The meeting:

a) urged States to provide annual updates on implementation issues and progress made; and

b) encouraged States to complete the development of national plans and ensure compliance with the dates indicated in the plan.

Agenda Item 3: APAC Region PBN Implementation

3.1 **Presentation of Working Paper 3 (WP/3): FPP Update**. The FPP Manager, Capt. Dave VanNess, presented WP/3 to provide an update on the activities and progress of the ICAO Asia-Pacific Flight Procedure Programme (FPP) and propose a draft APANPIRG Conclusion for consideration by the meeting.

3.1.1 The FPP Manager informed that to date, seventeen States have joined the FPP, nine as *Active Participating States/Administrations*, including the host State China, and eight as *User Participating 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, the FPP office opened in March 2010. The 1st Steering Committee Meeting was held 11-12 May 2010 in Beijing. The outcomes of that meeting included endorsement of the budget and work programme and concluded that PBN Airspace Design, Procedure Design Quality Assurance and PBN Safety Assessment should be included in the training offered by the FPP.

3.1.2 The first FPP PANS OPS Initial Course was very successfully conducted from June 21 to July 16. Mike Tam, the FPP Chief of Training and Sridhar Ramamurthy from India, were the instructors. There were fifteen participants from eight States. There were more than 25 nominations for the course; however class size was limited due to the size of the classroom. The next Initial Course is scheduled for 3-28 January 2011 in Beijing. The FPP is tentatively planning to offer two courses per year in 2011 and 2012, as long as demand warrants it. The first PBN Procedure Design Course, which teaches PBN procedure design criteria, except for RNP AR, is being conducted from

1-17 September in Beijing. The FPP will have a newly renovated, bigger classroom available starting with this course, and consequently the class size has been raised to 24. There are 24 attendees from ten States in this first class. The FPP has been negotiating for some time to bring an RNP AR Procedure Design Course from outside to Beijing in order to train the FPP staff and the regional pool of procedure design instructors. Any remaining slots in this class will be offered to the FPP Members. Unfortunately, that course is not going to be ready to conduct in October of this year as planned and the new target date will now be some time in the second quarter of 2011. The FPP will plan to offer the RNP AR Procedure Design Course as needed, but probably not to exceed once per year. Many States do not have the expertise available. Once their procedure designers are trained to conduct OJT, the FPP will offer OJT in 3-week blocks, based on instructor resource availability. Trained procedure designers would be 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 schedule this type of training. Presently two trainees are tentatively scheduled for OJT in November 2010.

3.1.3 The FPP activities outside of preparation for these training courses, has been focused on setting up the office and training the FPP Staff. The FPP is presently preparing to provide its first procedure design services on a fee basis to one of the States in the region that has requested PBN procedures for its international airport. States were requested to consult the FPP website **http://www.fpp-icao.org** for the latest information. The site is still a work in progress; however it should continue to improve.

3.1.4 **Participation in the FPP.** The meeting was informed that any State in the region can join the FPP at any time by signing the programme document previously transmitted by State Letter from the ICAO Regional Office in Bangkok. There are many reasons to join, and with the FPP now in operation, few reasons not to join. The FPP encourages States, that can afford to do so, to join as Active Participating States, as the current number of Active Participating States is still less than was envisioned when it was agreed to go forward with this concept of Active Participating States and User States. Also, some States that signed on as User States may wish to consider changing their status to Active Participating State, now that the FPP is operational and they can see the benefits they can receive. What is most important however is that States join in this regional programme, regardless of which status, in order to make it a truly regional cooperative effort to achieve the many safety, access, capacity, efficiency and environmental benefits that are possible with PBN implementation.

3.1.5 The meeting noted with appreciation the establishment of FPP in Beijing, China and looked forward to a continued communication between FPP and the PBN/TF. To encourage participation in the FPP the following draft APANPIRG Conclusion was agreed to by the meeting and proposed for consideration by the APANPIRG meeting:

> **Draft Conclusion 7/2: Participation in the Asia-Pacific Flight Procedure Programme**
>
> States in the Asia-Pacific Region are encouraged to take part in the regional cooperative effort to achieve the safety, access, capacity, efficiency and environmental benefits that are possible with PBN implementation, by joining the Asia-Pacific Flight Procedure Programme (FPP).

3.2 **Presentation of Working Paper 4 (WP/4): Review Outcome of CNS/MET SG/14 Meeting.** Outcome of the Fourteenth Meeting of CNS/MET Sub Group of APANPIRG, held from 19 to 22 July 2010 in Jakarta, Indonesia was presented by the Secretariat. Meeting was informed that the integrated Task List proposed by PBN TF was recommended by CNS/MET SG/14 for acceptance by APANPIRG. The meeting noted actions taken by the CNS/MET SG on the recommendations made by PBN TF/6. In respect of draft Conclusion 14/15, on the limitation of older generation FMS, the meeting after discussing another relevant paper presented by Japan (WP/8), formulated the following draft Conclusion (Proposed amendment):

Draft Conclusion 14/15: that, ICAO (IFPP, PBNSG) be invited to note, once again, the importance of the limitation of older generation FMS in storing multiple procedures for the same type of navigation system for a runway. This limitation occurs when pilots attempt to select a specific approach that is not stored in the FMS navigation database. ICAO is requested to consider establishing additional guidance, supplementing existing PANS provisions, and to explore solution(s).

3.2.1 The Meeting also invited IATA to provide further information on the subject, from the perspective of avionics engineering.

3.2.2 CNS/MET SG went through a brief on the report of PBN State Plan Harmonization assessment carried out by a volunteer group of States and IATA. CNS/MET SG was of the opinion that non submission of plan should not be viewed as a deficiency, but efforts should be made to find out the reasons for non submission of plan by the States. While discussing issues related to the revision of GNSS Manual (Doc 9849), CNS/MET SG expressed its concern about unsatisfactory implementation of GNSS in the region. It was informed that the list of identified hurdles had already been circulated to the designated focal contact points for PBN implementation in the States for comments and it has been requested that additional impediments, if any, should be informed so that the revision of GNSS manual can adequately address those issues. CNS/MET Sub-group also noted the proposal for establishment of PBN Regional Development and Implementation (REDI) Team including its need and proposed ToR.

3.2.3 The meeting was informed about the efforts being made in the development of a standard ionospheric model for the region and the outcome of the International Flight Inspection Symposium held in Beijing, China.

3.2.4 The meeting reviewed the outcome of CNS/MET SG/14 meeting in respect of navigation issues and noted further progress on the issues identified in the Report

3.3 **Presentation of Working Paper 5 (WP/5): PBN State Plan Harmonization Analysis Report**. IATA presented this Paper. At the PBN/TF/6 meeting held in February 2010, IATA and a group of volunteering States were tasked to conduct a review and provide a harmonization report of State PBN implementation plans. IATA served as coordinator and Australia, Hong Kong China, New Zealand and Thailand formed the review team.

3.3.1 The goal of the review was to assess the quality of State plans, and to identify regional implementation challenges and harmonization issues.

3.3.2 Of the 40 States within APAC Region, 21 State plans have been submitted. Of those plans, 8 were rated Robust (with only minimal improvements needed), 4 were rated Marginal (needing significant improvement) and 9 were rated Incomplete (no viable plan documented).

3.3.3 The implications of these results are that many States have not committed the resources and/or lack the proper knowledge and expertise required to plan and successfully implement PBN.

3.3.4 Two of the most significant areas of challenge appear to be conducting safety assessments and including international data in PBN fleet readiness assessments. These will require regional and/or global solutions to provide States with the required methodologies and data.

3.3.5 Plans submitted appear to be fairly well harmonized in all areas. However, the potential exists for States that are further advanced in PBN development, to implement in a manner that doesn't fully account for operational need and/or capability and at a pace that exceeds the evolution of ICAO PBN specifications, specifically in Instrument Approach implementation.

3.3.6 The meeting was informed that States will be advised of the review results through a confidential letter issued by the ICAO APAC Office.

3.3.7 **Discussion**: In the ensuing discussion, the meeting was apprised that the criteria for review of State plans were derived from the Regional plan. It was informed that none of the States in APAC region had addressed BPE 3 (Assessment of PBN Fleet Readiness) and that BPE 9 (Safety Assessment) and BPE 10 (Description of Tangible Benefits) were addressed by very few states. The need for guidance material on safety assessment was highlighted by most States. The meeting was informed that ICAO was developing /preparing guidance material on Safety Assessment and a data base on the capabilities/readiness of aircraft with regard to PBN. It was generally felt that the benefits of PBN needed to be appreciated and understood at the appropriate State level so that adequate resources are made available to facilitate efficient implementation of PBN.

3.3.8 The meeting thanked the review team (Australia, Hong Kong China, New Zealand, Thailand and IATA) for the excellent effort in highlighting the deficiencies in the State Plans. The meeting noted the results of the State plan review and harmonization report, and recognized that greater effort was required in meeting the ICAO implementation targets. The following Action Items/ Conclusions were endorsed by the meeting:

Action Item 7/3: All States with existing PBN implementation plans are requested to review and revise plans as necessary to ensure they are in alignment with the APAC Regional plan and ICAO PBN requirements.

Action Item 7/4: States that are yet to develop their PBN implementation plan are requested to do so in an expeditious manner and submit the same to ICAO APAC Office at the earliest.

Action Item 7/5: Developing States are encouraged to identify shortfalls and challenges to implementation and inform the APAC PBN Task Force accordingly.

Action Item 7/6: The Secretariat is requested to provide information to ICAO HQs on the review mechanism adopted by the review team, for use in other regions.

Action Item 7/7: The Secretariat is requested to forward Appendix D [APAC Short Term Implementation Target for Continental, Oceanic and Remote Continental Airspace(s)] to PBN/TF/7 – WP/5 PBN State Plan Harmonization Analysis Report to ICAO HQs for information.

Conclusion 7/8: States that are further advanced in PBN implementation are encouraged to contribute to regional efforts to accelerate implementation.

3.4 **Presentation of Working Paper 6 (WP/6): Regional Support Strategy for PBN Implementation**. IATA presented this Paper. The paper highlights that the Thirty-sixth Session of the ICAO Assembly adopted Resolution A36-23, resolving that States and PIRGs complete a regional PBN implementation plan by 31st Dec 2009 in order to achieve established timelines for en-route, terminal area and instrument approach implementation. The paper addresses the need for a Regional Support Strategy to provide direct support to States in an effort to accelerate PBN implementation within the Asia Pacific Region.

3.4.1 While elaborating on the proposed strategy, IATA stated that:

a) Prompt action by the Region and by States is required to accelerate PBN planning, development and implementation.

b) A comprehensive Regional Support Strategy is required and should include (but not be limited to) the following objectives:

i. Establishing a regional working-level team or forum to identify implementation needs;
ii. Formulation of cooperative arrangements with volunteering States;
iii. Development of additional support mechanisms;
iv. Further promotion of PBN to decision makers.

c) The creation of PBN Regional Development and Implementation (REDI) Teams is proposed to provide working level support in areas such as:

i. completion and improvement of PBN implementation plans;
ii. conducting safety assessments;
iii. collection of required data and practices to maintain data integrity;
iv. guidance to establish the regulatory framework, approvals process and other mechanisms necessary for implementation and sustainment of PBN capabilities.

d) States that are further advanced in PBN implementation would be encouraged to participate on the PBN REDI Teams.

e) IATA volunteers to work as an industry partner to provide support to this effort.

f) The Regional Support Strategy also needs to address providing guidance to States in PBN en-route implementation, airspace route design and harmonization across FIRs.

g) An effective Regional Support Strategy will also need continued coordination, progress monitoring and reporting. The PBN TF appears to be best suited for this role.

3.4.2 **Discussion**: Hong Kong China was of the view that creation of REDI teams would lead to replicating of tasks in the presence of PBNTF. It suggested that some Task Force Team(s) can pick up the work of the proposed strategy (REDI) with little additional resources. It was generally accepted that the proposed strategy would entail additional resources and may result in duplication of effort. New Zealand stated that there was a need to ask States as to what assistance they needed and highlighted that the States which apparently need/require assistance are not present in the meeting(s). The Chair pointed out that the PBN TF was focusing on States' terminal areas/approaches and not enough attention is being given to en-route PBN requirements (State to State) as it cannot be undertaken by the existing PBN Task Force. Similarly GO teams are responsible for GAP analysis only. It was suggested that the FPP or a similar office could/should be utilized to support States with the en-route PBN issues. IATA stressed that there was a need to have a mechanism to enable working level assistance to States who are struggling with PBN implementation. While it was generally agreed that there was a need to support such efforts but it was felt the proposed strategy (REDI) needed further review/refinement to address management and resource issues.

3.4.3 A potential resource risk was identified in ICAO and an offer was done to have the regional management to be performed through the COSCAPs which currently fall under the ICAO Regional office management.

3.4.4 After extensive discussion, the meeting formulated the following Conclusion:

Conclusion 7/9: The meeting agreed that the principles of the proposed activities of the REDI teams are very beneficial and are in line with ICAO HQ concepts of the GO-TEAM visits that are executed in partnership with IATA and industry partners. It was however the opinion of the meeting that the work of the REDI teams may overlap the work of the Go-teams and it was decided that although in agreement with the principles, further work needs to be done on the management structure, and the relation to the Go-team efforts.

3.5 **Presentation of Working Paper 9 (WP/9): Report on ATM/AIS/SAR/20**. This paper was presented by the Secretariat. The Working Paper presents an overview of the outcome of the twentieth meeting of the Air Traffic Management/Aeronautical Information Service/Search and Rescue Sub Group of APANPIRG (ATM/AIS/SAR SG/20) held from 05-09 July 2010 at Singapore. The paper highlights some of the important issues relating to PBN.

3.5.1 At the PBN TF/6 meeting held in February 2010, a group of volunteering States (Australia, Hong Kong China, New Zealand and Thailand) and IATA were tasked to conduct a review and provide a harmonization report of State PBN implementation plans. Due to rescheduling of PBN/TF/7 meeting, the report was therefore directly presented to the ATM/AIS/SAR/20 Sub-Group.

3.5.2 The twentieth meeting considered it necessary to encourage States who had not submitted their Performance Based Navigation (PBN) implementation plan, to do so as soon as possible. The meeting reviewed the Working Paper submitted by IATA on PBN State Plan Harmonization Report.

3.5.3 A specific area of the Regional Plan that needs attention is implementation in the en-route phase with regards to airspace design and harmonization across FIR boundaries. IATA reinforced the need for increased support and proposed items that should be included within the Regional Support Strategy. It was suggested that the creation of PBN Regional Development and Implementation (REDI) teams may be considered to help fulfill several of these objectives and engage at a working level to coordinate and provide assistance to States.

3.5.4 **Discussion:** The paper generated further discussion on the REDI concept. While most participants agreed with the requirement to support States in need of assistance/guidance, the general consensus was that the proposed strategy needed further review/refinement. The content of the discussion was similar to that recorded under WP 4.

Agenda Item 4: PBN Implementation Issues

4.1 **Presentation of Working Paper 8 (WP/8): FMS Coding Issue Encountered during the Development of RNP APCH Procedures.** Japan presented this Paper. This WP, in response to WP12 at PBN/TF/6, intends to explain the contents of ARINC424 specification, design of existing FMS, and related PANS-OPS statements. It is emphasized that the issue exists, not in the length of the procedure identification, but in the fact that some older FMS can accommodate only one approach procedure per type of navigation system per runway. The WP proposes possible solutions minimizing the existing problem, in accordance with existing PANS-OPS statement.

4.1.1 **Discussion:** Hong Kong China informed the meeting that it had submitted the referred WP at the PBN/TF/6 meeting and the problem as they see still exists. It was generally felt that this was a supply and design issue and the manufacturers are generally aware of the problem. There was a need for creating better awareness through education. Japan stated that the matter had been discussed in the IFPP meeting and felt that there was no solution. Japan suggested that Conclusion 14/15 as reflected in WP 4 (Outcome of APANPIRG CNS/MET SG/14 meeting be

modified. The proposed re-drafted Conclusion 14/15 is reflected under paragraph 3.2 above. The meeting recognized the issue raised by Japan and the only plausible solution seemed was that aircraft are upgraded with new FMS.

4.1.2 The meeting requested:

Action Item 7/10: IATA to take the matter to the Airlines Electronics Engineering Committee (AEEC) to see if it can provide an answer/solution.

4.2 **Presentation of Working Paper 10 (WP/10): Proposals to Facilitate PBN Implementation.** This paper was presented by the Republic of Korea. The paper provides information on the PBN implementation status and difficulties encountered while proceeding with PBN Implementation Project, especially PBN safety assessment issues, in the Republic of Korea. In line with PBN safety assessment, the paper suggests developing PBN safety assessment validation procedure, providing States in the region with PBN safety assessment assistance including experts and providing contracting States with PBN safety assessment guidance material.

4.2.1 Considering the difficulties mentioned in the paper and current practices that PBN safety assessment procedures based on SMM (Doc 9859) are used by some States, the Republic of Korea suggests that the meeting consider developing PBN safety assessment validation procedure by ICAO to ensure the harmonized application for PBN safety assessment. In addition, it suggests that the meeting considers providing States in the region with PBN safety assessment assistance including the experts in this area. Republic of Korea feels that Asia and Pacific Flight Procedure Program (FPP) has the wherewithal to assist States in the region. Finally, the paper suggests that the meeting requests ICAO to provide contracting States with PBN safety assessment guidance material to facilitate PBN implementation and to meet the timeline set by ICAO as soon as possible.

4.2.2 **Discussion:** The Republic of Korea paper prompted a lot of discussion on safety assessment. The meeting was informed that the matter of safety assessment had been taken up with ICAO HQs under two APANPIRG Conclusions (C.20/37 and C.20/42). The ANC has noted the request and directed that the matter related to PBN issues be addressed through the appropriate ANC Panel and Study Groups.

4.2.3 The meeting was also informed that ICAO was looking at the Airspace Guidance Manual to provide guidance. COSCAP informed the meeting that safety assessment was addressed in the PBN Operational Approval Handbook.

4.3 **Presentation of Working Paper 12 (WP/12): PBN Operational Approval Handbook.** COSCAP-SEA presented this Paper. The Performance Based Navigation (PBN) Operational Approval Handbook has been developed by CASA Australia in coordination with ICAO and the COSCAP programmes of Asia Pacific. This Handbook has been developed in conformance with the ICAO PBN Manual DOC 9613 and provides additional guidance on PBN Operational Approval requirements.

4.3.1 The purpose of this Handbook is to provide guidance to personnel responsible for the assessment of applications for operational approval to conduct PBN operations. Over the years, a number of regions have established local RNAV and RNP standards which led to complexity in international operations and operational approvals. ICAO has developed the concept of PBN and harmonized the concepts and requirements which are now contained in the ICAO PBN Manual (DOC 9613). The Handbook supplements the information contained in the PBN Manual related to operational approval of PBN.

4.3.2 Additionally, PBN Model Regulations have also been developed by COSCAPs, which would provide the regulatory basis for approval of PBN operations.

4.3.3 COSCAP also informed the meeting of the training conducted on PBN Operational approval and the future training plan which includes: 1 – 5 November 2010 (Thailand) PBN Operational Approval Course; 8 – 10 November 2010 (Thailand) PBN Operational Approval RNP AR Course; and November 2010 (India) PBN Operational Approval Course (yet to be confirmed).

4.3.4 The meeting was informed that ICAO was in the process of developing further guidance material and training.

Agenda Item 5: State / Industry Presentations

State Presentations

5.1 **State PBN Plan and Status of PBN Implementation Progress**. Six (6) States made presentations on the status of implementation of their respective PBN Plans.

5.2 **Cambodia**: In March 2010 a PBN expertise from Aerothai has been invited to conduct a PBN Seminar in Cambodia. PBN training and seminar have been conducted for SSCA'officials, ATC, AIS, Engineer and other relevant staff. Two conventional flight procedure designers will be sent for comprehensive PBN procedure designs courses in Singapore and in France in September this Year. WGS 84 coordinates for all international airports have already resurveyed and published in Cambodia AIP since 15 January, 2010. STAR an SID at two international airports have been discussed, Some ATS Routes have been selected to upgrade to be RNAV Route, will be implemented in the short term period to get in line with State PBN Plan.

5.3 **Hong Kong, China:** Hong Kong, China reported the progress of PBN implementation in Hong Kong. Hong Kong has implemented RNP AR APCH procedure to 2 runway ends on 3 June 2010. After the implementation of the RNP AR APCH, Hong Kong has achieved 50% implementation of short term target for Approach Airspace as stated in the PBN Implementation Plan. As the procedure requires RNP 0.3 performance in the intermediate and missed approach segments, RNP AR APCH is the only choice at the moment. Hopefully, when new Navigation Specification likes Advance RNP APCH is available, Hong Kong would be able to covert the RNP AR APCH to Advance RNP APCH to avoid the requirements of special approval for operators.

5.3.1 Hard copies of Hong Kong PBN Implementation Plan are provided to the TF members.

5.3.2 Presently, Hong Kong plans to develop more RNP APCH procedures to enhance the operating efficiency and to minimize noise impact of flight procedure. However, due to the limitation of the FMS, implementation of second RNP APCH for airport with multiple runways likes Hong Kong is not possible at the moment (the issue was presented in form of working paper in PBN TF 6 by Hong Kong).

5.4 **Lao PDR**: To recognize the benefits of PBN and GNSS implementation prescribed in the Asia Pacific PBN Implementation Plan, the Department of Civil Aviation of Lao PDR has set up a Working Team to support the project of New CNS/ATM Development Plan, which includes PBN implementation. The Working Team is responsible for coordination, cooperation and assistance to the Japan International Cooperation Agency (JICA) experts for the Master Plan Study and the development of the New CNS/ATM Systems. The Draft CNS/ATM master Plan has been finalized and will be adopted by the Department of Civil Aviation soon. Lao PDR has developed a PBN Roadmap with timelines for PBN application between the year 2010 and 2015. The Road Map includes Continental Rotes, TMA and Approach.

5.5 **Maldives:** PBN implementation in the Maldives includes implementation of RNAV10 in the en-route sector, RNAV1 in the terminal sector and RNAV (GNSS) approach procedures.

5.5.1 As part of regional PBN implementation program, selected routes have been re-designated RNAV 10 since Nov 2009.

5.5.2 PBN SIDs and STARs and Approaches have been introduced at Male International airport effective 29 July, 2010. For RNAV **(GNSS)** SIDs and STARs operations, aircraft shall be GNSS equipped and the navigation systems shall meet ICAO RNAV1 standard of accuracy or equivalent. For RNAV **(GNSS)** Approaches, aircraft shall be GNSS equipped and the navigation systems shall meet ICAO RNP 0.3 standard of accuracy or equivalent. Operators/pilots who are not approved to fly the RNAV **(GNSS)** SIDs and STARs are to fly the existing VOR/DME SIDs and STARs or expect radar vectors. Operators/pilots who are not approved to fly the RNAV **(GNSS)** approach procedures are to fly the existing VOR/DME, ILS/DME approaches.

5.5.3 The first prototype charts of RNAV Visual Flight Procedure (RVFP) for Male International Airport have been developed. General guideline are found in FAA Order 8260.55 RVFP is a procedure that capitalizes on RNAV system technology to promote stabilized visual approaches to a designated runway. Male' RVFP are only for RNAV approved aircraft using global positioning system (GPS) and will be available under radar. The lead operator, Emirates, will demonstrate the flyability of the procedures in the simulator and in real-time flight trial in October

5.6 **Singapore:** Singapore in collaboration with Indonesia, implemented a new RNAV route M774 in April 2010 in Singapore FIR. This new route M774 (RNAV 10) runs above an existing conventional route A464 where the vertical limit of A464 is reduced to FL250. Using the same principle as M774, another new RNAV route M635 will be implemented above an existing conventional route A576 later this year.

5.6.1 Singapore conducted three Optimised Profile Descent (OPD) trials with Singapore Airlines from September 2009 to June 2010. The data collected from the trial showed positive results with fuel savings, reduction in CO2 emissions and time savings for the flights that participated in the trial. The operating procedures used for the trial will be fine-tuned in accordance with the recommendation of ICAO CDO (Continuous Descent Operations) Manual Doc 9931. Singapore intends to implement CDO in the Singapore FIR within the next 6 months.

5.6.2 Singapore is currently an Active Participating State in the APAC FPP and will be setting up a local internal Flight Procedure Design Office (FPDO) next year to design procedures in accordance to the Singapore PBN implementation plan. More local officers will be trained and two officers have attended the flight procedure design training in the APAC FPP Office in Beijing this year. To support the work, software will be procured to aid flight procedure designing and airspace/air traffic analysis.

5.7 **Thailand:** In June 2009, the Thailand National Working Group for PBN & GNSS approved the Thailand PBN Implementation Plan. This Plan aims to provide aviation stakeholders with appropriate guidance and timelines to allow proper preparation and equipage for PBN implementations within Bangkok Flight Information Region (FIR). The Plan is aligned with the Asia/Pacific Regional PBN Implementation Plan developed by ICAO Asia/Pacific PBN Task Force and the 2007 ICAO Assembly Resolutions. It also provides assessments of fleet readiness status and CNS infrastructure, which results in selection of appropriate PBN navigation specifications and implementation strategies for En-route and Terminal Area operations. For short-term implementation, RNAV 10, RNAV 5 and RNP 4 are being considered as appropriate navigation specifications for en-route applications. Moreover, RNAV 1 is considered the appropriate navigation specification for

terminal area procedures, such as SIDs and STARs. For approach operations, RNP APCH with Baro-VNAV is the preferred navigation specification.

5.7.1 Since February 2009, the Department of Civil Aviation has approved full operation of RNP Approach Procedures for Phuket International Airport. These procedures enhance safety and efficiency in the approach operation and resolve the offset problems caused by the limitation of installation sites of conventional navigation aids. RNP APCH Procedures for Hat Yai have been available for commercial operations since December 2009. These RNP APCH Procedures help enhance the level of safety and efficiency in approach and landing operations to Hat Yai International Airport, especially to Runway 08, of which no instrument approach procedure with conventional navigation aids was feasible. Moreover, RNP APCH Procedures for RWY 26 also provides back-up approach procedures for existing ILS procedures. Two RNP APCH Procedures for Samui airports have designed and successfully flight validated by AEROTHAI. The procedures have been authorized to be used in commercial operations by the Thai DCA since May 2010. These RNP APCH Procedures help enhance the level of safety and efficiency in approach and landing operations to Samui Airport, especially to Runway 17, since their flexible flight path can navigate the aircrafts around mountainous areas while still providing runway-aligned final segment.

5.7.2 AEROTHAI in coordination with Thailand's National Working Group for PBN and GNSS Implementation has completed the design for additional RNP APCH procedures for Chiang Mai and Krabi airports. All of which are being reviewed by DCA Thailand prior final flight validation. The procedures are expected to be in operation by early 2011. AEROTHAI is now also re-designing Standard Instrument Arrivals (STARs) and Standard Instrument Departures (SIDs) for Suvarnabhumi and Don Mueang airports based on RNAV-1 navigation specification using DME/DME/IRU and GNSS. The new design is expected to provide more efficient terminal area operations, while reducing needs for radar vectoring and supporting continuous descent and unimpeded climb operations. Moreover, the company is designing RNP APCH with Baro-VNAV to provide back-ups to ILS to both Suvarnabhumi and Don Mueang airports.

Industry Presentations

5.8 **DAC International:** DAC International has provides avionics solutions for the world's airlines, military and corporate aircraft operators. DAC is a leading edge aerospace engineering, manufacturing and marketing firm with key alliance partnerships to include provision of flight management systems, TAWS, aircraft communication and display systems for military, commercial and general/business aviation aircraft. DAC manufactures the Genesys Electronic Flight Bag Solution in use on many different aircraft types. DAC International Inc. is an operating subsidiary of The Greenwich Aero Group.

5.8.1 The presentation covers a description of DAC and Universal Avionics Systems. The presentation covers the following topics with respect to WAAS/TSO C146 Systems

i. Overview of the technology including what an FMS System components are

ii. Enhancements to the FMS technology with respect to processing capability, features and capabilities

iii. Target Markets and issues relating to up take of the technology into APAC/India Customers including APAC/India OEM Aircraft Platforms

iv. Examples of cockpit upgrades

5.9 **Thailand PBN GO Team Visit**: On 25-27 August 2010, the first ICAO/IATA PBN Go-Team was successfully conducted in Thailand. Four specific work areas which were discussed during the Go-Team Visit are:

i. PBN Operational Approvals;
ii. PBN Implementation for Bangkok TMA with Specific Emphasis on Continuous Descent Operations;
iii. Suitability of RNP AR approaches to Mae Hong Sorn Aerodrome; and
iv. Physical Limitations of Aerodrome for Instrument Flight Procedures.

5.9.1 Seven members of ICAO/IATA PBN Go-Team, including representatives from ICAO, IATA, IFALPA and the industry, has conducted three-day seminar/workshop on the four work areas. Approximately twenty participants from Thai DCA, AEROTHAI, and airlines operators participated in the active discussions. Participants range from active pilots, air traffic controllers, regulators, engineers, and airspace/procedure design specialists. The meeting participants are in view that the Go-Team Visit is an excellent opportunity for exchanging ideas and knowledge with ICAO, IATA and experts from the industry. The meeting also addresses specific concerns related to PBN implementation in Thailand. An ICAO visit report along with implementation recommendations are planned to be submitted to the Thai Government by the end of September 2010. Follow-up activities will be followed.

Agenda Item 6: Task List Review

6.1 PBN/TF/7 meeting reviewed the Task List. The Secretariat provided the status of implementation of various Action Items/ Decisions/Conclusions arising from the PBN/TF/6 meeting. The Task List is placed at **Appendix 'D'.**

6.1.1 The Meeting noted the status of implementation.

Agenda Item 7: Feasibility of Establishing a regional RAIM Prediction System

7.1 **Presentation of Working Paper 11 (WP/11) - Technical and Operational Requirements for APAC Regional RAIM Prediction System**. Thailand presented the Paper on Regional RAIM Prediction System.

7.1.1 GNSS is considered a main navigation infrastructure supporting PBN operations. It is now also becoming a critical component of surveillance system, such as ADS-B. Unpredicted outage of GNSS services can cause undesired interruptions on aircraft operations. ICAO Annex 10 and ICAO PBN manual require States and ANSPs to provide timely warnings of GNSS RAIM outages. RAIM prediction results are needed daily by pilots, flight dispatchers, air traffic controllers and airspace planners.

7.1.2 Thailand introduced a working paper discussing a proposal to establish regional RAIM Prediction System. A common, regional RAIM prediction services can prove to be an effective solution that will enhance seamless air traffic operation, while providing cost-effective investment solution. By harmonizing RAIM prediction information among States, the regional RAIM prediction service will enhance seamless air traffic operation, while providing a cost-effective investment solution. A regional RAIM project will also provide a forum for States to share their knowledge and experiences.

7.1.3 The PBN TF noted that this proposal is also in line with ICAO APANPIRG Decisions 20/38 and 20/39 which task the ICAO PBN Task Force to examine the feasibility of establishing a regional RAIM prediction system and invite ICAO to develop guidance materials on establishing common implementation rules and technical standards for GNSS reporting and prediction requirements. The PBNTF also noted that the 46th DGCA Conference encourages States to support and place priority on the ICAO Task Forces and work programmes for the Asia-Pacific. Proposals on specific mechanisms, such as a regional RAIM prediction service, could also be looked into.

7.1.4 The PBN TF was informed that The APEC GNSS Implementation Team (GIT), a team established under the Asia-Pacific Economic Cooperation (APEC) Transportation Working Group, during its thirteenth meeting in 2009, has expressed its willingness to work cooperatively with ICAO PBN Task Force to support the establishment of a regional RAIM prediction service. The PBNTF also noted with appreciation that Thailand through AEROTHAI is willing to serve as a project coordinator for this important regional activity.

7.1.5 The PBNTF agrees in principle the establishment of a regional RAIM prediction system and cooperation between the ICAO PBN TF and the APEC GIT. The PBNTF also endorses the **Minimal Technical and Operational Requirements for a Regional RAIM Prediction System** as followings:

7.1.6 *Basic Common Denominator* - Noting the differences among different RAIM algorithms on-board different aircraft, a regional RAIM prediction system provided by a service provider, such as an ANSP, should provide a "basic common denominator" RAIM prediction service for "basic" GNSS receivers, such TSO-129 (Fault Detection) and TSO-145/146 (Fault Detection and Exclusion).

7.1.7 *Prediction Period* – A regional RAIM prediction system shall provide prediction for RAIM outage and number of GNSS-satellite availability for a 72 hour period using the latest available GPS NANU.

7.1.8 *Approach Operation*s - A regional RAIM prediction system shall support aircraft approach operations based on RNP APCH (with/without Baro-VNAV) navigation specification. The system shall calculate the predicted RAIM availability for a 72 hour period for specific Aerodromes. The algorithms shall address the RAIM requirements for GNSS receivers operating in Approach operations (±0.3NM). Both the Fault Detection (FD) and Fault Detection and Exclusion (FDE) algorithms shall be provided. The system shall calculate the predicted RAIM availability at the Aerodrome Reference Point (ARP) for baro (pressure altitude) aided and non-baro aided GNSS user equipment at 1 minute intervals or better.

7.1.9 To encourage States' participation on the regional RAIM prediction service and to harmonize the operational and technical requirements, the PBN TF proposed the followings Draft Conclusion to be considered by the APANPIRG:

> **Draft Conclusion 7/11:** Endorsement of Minimum Technical and Operational Requirements for a Regional RAIM Prediction System
>
> That, the Minimum Technical and Operational Requirements for a Regional RAIM Prediction System for the APAC Region as shown in **Appendix 'E'** is endorsed.
>
> **Draft Conclusion 7/12:** Participation on the Regional RAIM Prediction Service for Asia/Pacific Region
>
> States in the Asia-Pacific Region are encouraged to take part in the Regional RAIM Prediction System for the APAC Region.

Agenda Item 8: Update of Task Lists

8.1 The PBN/TF/7 meeting updates the Task List – PBN Task Force. The updated Task List is placed at **Appendix 'F'.**

Agenda Item 9: Any Other Business

9.1 **Hosting of ICAO Asia Pacific PBN Implementation Seminar in 2011.**

9.1.1 The PBN/TF/7 meeting agreed to hold a PBN Seminar during the first quarter (January – March) of 2011. It was decided that the two-day Seminar will be followed by the three-day PBN/TF/8 meeting.

9.1.2 As more than one State indicated an interest in holding the next PBN Seminar the meeting requested the interested States to formally advise the ICAO Secretariat by 5 October 2010 of its intent.

Agenda Item 10: Date and Venue for Next Meeting

10.1 PBN/TF/8 meeting will be held during the first quarter (January-March) of 2011. The date and venue will be advised when confirmed.

11. Closing of the Meeting

11.1 Review of Draft Report. The meeting reviewed the Draft Report and gave it concurrence after incorporating changes.

11.2 Closing Remarks

11.2.1 The Chair thanked the ICAO Secretariat for once again their excellent support to the Task Force and wished the Task Force meeting participants a safe trip home.

11.2.1.1. At the conclusion of the meeting the Chair noted that Mr. Fareed Ali Shah would be taking retirement from ICAO in November 2010. Mr. Shah had provided exemplary secretarial and functional support to the PBN Task over its operation along with very practical advice and assistance to all members of the group. His excellent work was fundamental to the achievements of the Task Force. The Chair again thanked him for his untiring contribution to the implementation of PBN and wished him well in his retirement.

11.2.2 The Secretary, PBN Task Force thanked the Chairman and all participants for the continued support and cooperation extended to him over the last three years. He wished the APAC PBN Task Force all success in the years ahead and was optimistic that the goals set by the PBN Task Force would be achieved in an efficient and expeditious manner.

11.3 The Chair declared the meeting closed.

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Seventh Meeting of the Performance Based Navigation Task Force (PBN/TF/7)
(Bangkok, Thailand, 1 – 3 September 2010)

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LIST OF WORKING PAPERS (WPs) AND INFORMATION PAPERS (IPs)

WORKING PAPERS

Number	Agenda	Title	Presented by
WP/1	1	Adoption of Agenda	Secretariat
WP/2	2	PBN Update	Secretariat
WP/3	3	FPP Update	FPP
WP/4	3	Outcome of APANPIRG CNS/MET SG/14 Meeting on Issues Related to Navigation	Secretariat
WP/5	3	PBN State Plan Harmonization Analysis Report	IATA
WP/6	3	Regional Support Strategy for PBN Implementation	IATA
WP/7	2	Performance-Based Navigation – The Implementation Challenge	Secretariat
WP/8	4	FMS Coding Issue Encountered during the Development of RNP APCH Procedures	Japan
WP/9	3	Report on ATM/AIS/SAR/20	Secretariat
WP/10	4	Proposals to Facilitate PBN Implementation	Republic of Korea
WP/11	7	Technical and Operational Requirements for APAC Regional RAIM Prediction System	Thailand
WP/12	4	PBN Operational Approval Handbook	COSCAPs

INFORMATION PAPERS

Number	Agenda	Title	Presented by
IP/1	-	List of Working Papers (WPs) and Information Papers (IPs)	Secretariat
IP/2	5	PBN Manual Update	Australia
IP/3	5	Thailand PBN Implementation in 2010	Thailand
IP/4	5	Progress on PBN Implementation in the Maldives	Maldives
IP/5	4	ICAO Assembly – 37th Session Working Paper A37-WP/13 Performance Based Navigation – The Implementation Challenge	Australia

PRESENTATIONS

Number	Agenda	Title	Presented by
	5	PBN Avionics Upgrades for existing aircraft – A Suppliers Perspective	DAC International
	4	COSCAP Update	COSCAPs

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AGENDA

Agenda Item 1:	Adoption of Agenda
Agenda Item 2:	Global PBN Implementation – Update
Agenda Item 3:	APAC Region PBN Implementation
Agenda Item 4:	PBN Implementation Issues
Agenda Item 5:	State / Industry Presentations
Agenda Item 6:	Tasks List Review
Agenda Item 7:	Feasibility of Establishing a regional RAIM Prediction System
Agenda Item 8:	Update of Task Lists
Agenda Item 9:	Any Other Business
	9.1 Hosting of ICAO Asia Pacific PBN Implementation Seminar in 2011.
Agenda Item 10:	Date and Venue for Next Meeting

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STATUS OF IMPLEMENTATION
TASKS LIST – PBN Task Force

No.	Tasks/Strategy	Category	Status
C4/1	The APAC PBN TF encourages States to consider the GO Team visit.	Implementation	**On-going.** States are encouraged to consider the GO Team visit as required. **Status** **From 25-27 August 2010, the first ICAO/IATA PBN Go-Team was successfully conducted in Thailand.** **PBN/TF/7–IP/6 provides the details of the visit.**
C4/2	The APAC PBN TF requests the Global PBN Task Force to consider providing assistance to States which currently are at the early stage of PBN implementation.	-	**Closed.**
C4/3	The APAC PBN TF agrees to provide progress report of PBN implementation in the Asia-Pacific to the Global PBN Task Force	-	**Closed.** The PBN TF has provided progress report to the Global PBN Task Force.
C4/4	The APAC PBN Task Force requested that the Interim Edition (V '0.2') of the Regional PBN Implementation Plan be presented at theATM/AIS/SAR/SG/19 Meeting (June 22-26, 2009) for review as required by APANPIRG/19.	-	**Closed.**

No.	Tasks/Strategy	Category	Status
C4/5	The APAC PBN TF agrees to continue an annual review of the Asia-Pacific Regional PBN Implementation Plan	Reporting	**Routine** **<u>Status</u>** **PBN/TF/6 reviewed APAC Regional Implementation Plan.** **CNS/MET/SAR SG/14 recommended adoption of V. 2 by APANPIRG/21**
A4/6	Develop an up-to-date archive of all relevant guidance materials for each PBN implementation step as outlined in the PBN manual	-	**Closed.** Information on relevant guidance materials is currently available and can be downloaded from ICAO PBN web site. (http://www.icao.int/pbn) The Secretariat also provided a CD containing important PBN guidance and resource materials.
A4/7	Arrange future annual PBN implementation seminars to serve as a forum for exchanging expertise and implementation experiences and invite interested States who would like to host future seminar to make a formal proposal at the next PBN TF meeting and to invite industry representatives to attend the seminar	Education	**On-going.** The PBN TF/5 accepted Hong Kong's offer to host the second PBN Seminar, planned for Feb 2010, subjected to APANPIRG approval. **<u>Status:</u>** **Vietnam and Thailand have offered to host future PBN seminars.**
C4/8	In respect to the request by COSCAPs regarding the development of guidance material for APV, the APAC PBN TF recognized the work currently being conducted by the Global PBN TF to develop and review materials on the issues of APV and Non-Precision Approach as related to PBN	-	**Closed.**

No.	Tasks/Strategy	Category	Status
C4/9	The ICAO APAC PBN TF recommends that the PBNSG continue to review and revise the PBN Manual to achieve a more hierarchical and easily used structure to minimize the number and complexity of the airworthiness approvals required for PBN operations. The GPBNTF is considered to be an organization well placed to advise ICAO Regions on harmonization and the development of common standards	-	**Closed.** PBNSG noted the request from the APAC PBN TF. Materials and suggestions on structure of the PBN manual have been forwarded to PBN SG. Updated version of the PBN manual would be available in the second quarter of 2010.
C4/10	The APAC PBN TF agrees to continue coordination with other regional PBN task forces and the Global PBN Task Force to ensure harmonization of PBN implementation	Planning	**On-going.** Report on Global PBN Task Force activities are presented and noted by PBN TF/5.
A4/11	States are requested to provide progress report regarding PBN implementation at each Task Force meeting	-	**Closed.** Transferred to Action Item 5/08
A4/12	Mandate States to present their PBN Implementation Plan and to provide progress reports on the development of the State Plan at the each PBN TF meeting	Planning	**Routine.** States are requested to provide report on the developments of State PBN Implementation Plans. **Status:** **As of 31 August 2010** **21 State Plans received.** **Plans reviewed and comments being provided.** **After PBN/TF/6 Progress Reports provided by 9 States**
A4/13	Request the Task Force Chairperson and Rapporteurs to develop a common template for State PBN Implementation Progress Report to be reviewed by the next PBN TF meeting	-	**Closed**. The TF/5 agreed on the report template.

No.	Tasks/Strategy	Category	Status
C4/14	The APAC PBN TF agreed to develop a regional PBN progress report to be reported annually to CNS/MET and APANPIRG and to be posted on ICAO APAC and ICAO Global PBN web site	Reporting	**Routine.**
A4/15	Request ICAO Headquarter to provide a presentation on the requirement for safety assessment for PBN implementation and overview of how to conduct proper safety assessment at future PBN TF meetings	Education	**On-going**. The TF referred to the PBN SG for the development of safety assessment criteria. **Status**: **Issue Form sent to HQs** **ANC Action:** **To address this PBN issue through appropriate ANC Panels and Study Groups**
C4/16	The APAC PBN Task Force considers itself a suitable forum to facilitate and harmonize terminal and en-route PBN implementation in the Asia Pacific Region. Therefore, the Task Force requests APANPIRG to consider adding the following task into the Task Force's TOR. "*Facilitate and coordinate the harmonized implementation of PBN for terminal and en-route applications in the Asia Pacific Region*"	-	**Closed.** APANPIRG/20 has a decision to establish a Route Review Task Force.
A4/17	Recognizing that the PBN planning activities for the Asia-Pacific are nearing completion and acknowledging the Task Force's willingness to support actual PBN implementation, the APAC PBN Task Force request working papers regarding revision of the Task Force's work structure to be submitted for consideration at PBN TF/5. Members of the PBN TF are encouraged to coordinate intersessionally to prepare the working papers.	Implementation	**On-going.**
A4/18	Request ICAO to provide status report of the work by PBNSG, SASP and IFPP	-	**Closed.**
C5/01	Confirmed the likely inability of many APAC states to meet the APV implementation goals of Assembly Resolution A 36-23 within the required timeframe. The PBN/TF/5 meeting requested that, APANPIRG while taking note of the limitation of many of the APAC States, consider conveying the same to ICAO with the recommendation that the Resolution be reviewed.	Planning	**On-going.**

No.	Tasks/Strategy	Category	Status
C5/02	As the authorized GNSS Service Areas, in which SBAS based APVs may be implemented are very limited in coverage, the PBN/TF/5 meeting requests that APANPIRG consider the feasibility of establishing a regional SBAS capability to support all aircraft types.	-	**Closed.** CNS/MET will consider the feasibility of establishing a regional SBAS capability.
C5/03	That, the concern raised by the US GAO report was noted; and this concern be forwarded to APANPIRG and ICAO HQs.	-	**Closed**. US Government has guaranteed availability of minimum GPS constellation in writing to ICAO HQ.
C5/04	The PBN/TF/5 meeting recommends that the PBN Study Group review the current PBN GNSS reporting and prediction requirements with a view to establishing common implementation rules and technical standards for such requirements.	Implementation	**On-going.** APANPIRG Conclusion 20/37invites ICAO to develop the guidance materials. **Status:** **Issue Form raised** **ANC Action:** **To address these PBN issues through appropriate ANC Panels and Study Groups.**
C5/05	That, APANPIRG consider tasking the PBN TF with examining the feasibility of establishing a regional RAIM prediction system.	-	**Closed.** APANPIRG Conclusion 20/38 tasks the PBN TF with examining the feasibility of establishing a regional RAIM prediction system.
C5/06	That, the PBNSG consider the proposal to develop Guidance Material that provides a means to assign PBN capability to GPS IFR aircraft in the first instance without the need for recertification.	Education	**On-going.** APANPIRG Conclusion 20/37invites ICAO to develop the guidance materials. **Status:** **Issue Form raised**. **Same as C5/04**

No.	Tasks/Strategy	Category	Status
C5/07	That, States distribute the RNAV safety message and emphasize on all operators involved in RNAV to apply the lessons learnt on Human Factor issues, as discussed in the paper presented by New Zealand on RNAV Human Factors and System Safety.	-	**Closed.** APANPIRG Conclusion20/39 distributes the Report to the States for further distribution to all operators.
C5/08	That, States / Administrations be requested to use the PBN Implementation Progress Report Template for all future reporting on their status of PBN implementation. The Report should be submitted at each of the future PBN Task Force Meeting.	Reporting	**Routine.**
C5/09	That, States / Administrations be requested to submit their PBN Implementation Progress Report by 15 August 2009 for onward submission to APANPIRG/20 Meeting scheduled to be held from 7 – 11 September 2009.	-	**Closed.**
C5/10	That, the APAC Regional PBN Implementation Plan (Interim Edition Version 0.3) be presented at the APANPIRG/20 for approval.	-	**Closed.** APANPIRG Conclusion 20/41 adopted the APAC Regional PBN Implementation Plan (Interim Edition Version 0.3) as Version 1.0
C5/11	That, APANPIRG consider in conjunction with the proposal to establish a SEA RR/TF, acquiring the necessary resources to establish a Regional PBN Office or a dedicated Project to design PBN based regional air routes and facilitate their adoption by the States in the APAC region.	-	**Closed.**
C5/12	That, the PBNSG be requested to provide guidance on any PBN-specific aspects of en route safety assessment.	Education	**On-going.** **Status:** **Issue Form raised.** **Same as C5/04**
C5/13	That, presentation(s) on Safety Assessment be included in the Agenda for the PBN Implementation Seminar to be held in Hong Kong in February 2010.	-	**Closed.**

No.	Tasks/Strategy	Category	Status
C5/14	That, ICAO kindly assist with addressing the PBN safety assessment training needs in the region.	Education	**On-going** **Issue Form raised.** **ANC Action:** **To address this PBN issue through appropriate ANC Panels and Study Groups**
C5/15	Urged States to give detailed considerations to the operational need, safety and cost benefits prior to deciding on RNP AR Approach implementation.	-	**Closed.**
C5/16	That, APANPIRG agree to the PBN Task Force activities continuing for two additional meetings in the first half of 2010 using the Task Force's current TORs.	-	**Closed.**
C5/17	That, ICAO be requested to consider providing an annual summary of panel and working group activities to allow proper coordination amongst different groups (PBN/TF/4 Action Item 4/18)	Reporting	**Routine.**
A6/1	States are encouraged to consider implementing CDO in accordance with ICAO CDO Manual Doc 9331 on as many STARs as practicable to enhance fuel efficiency, ease pilot and ATC workloads, and reduce emission and noise.	Implementation	**States.** **On-going**
A6/2	States are encouraged to attend to ICAO PBN Airspace Design Workshop in 19-22 April 2010 to enhance their expertise with airspace design relating to implementation of PBN	Education	**Workshop conducted at SAA, Singapore, 28 June - 1 July 2010** **38 Participants from 15 States and 3 Int'l org.** **CLOSED.**

No.	Tasks/Strategy	Category	Status
A6/3	States are encouraged to attend CDO workshop to be hold in Bangkok on the week of March 15 in conjunction with IFPP meeting.	Education	**ICAO Continuous Descent Operations Briefing at Bangkok, 22 Mar 2010** **59 participants** **11 States** **CLOSED**
A6/4	IATA is requested to provide the progress on the development of global database for PBN approval at the PBN TF/7 Meeting.	Implementation	**IATA to provide details** **On-going**
A6/5	States are requested to list the challenges and impediments for PBN implementations to be reported at the PBN TF/7 Meeting.	Implementation	**Routine** **States.** **ROK Paper** **HK Paper** **Safety Assessment**
A6/6	A harmonization analysis report on State PBN Implementation Plans to be developed by IATA and volunteering States (Australia, Hong Kong, New Zealand and Thailand) and reported to the PBN TF/7 Meeting.	Planning	**21 State Plans reviewed** **8 Robust** **4 Marginal** **9 Incomplete** **CLOSED**
A6/7	States are requested to review the draft PBN Operational Approval Handbook and provide feedback at future PBN TF meetings. States are also invited to contribute relevant material to be integrated into the Handbook.	Implementation	**Nil comments received** **Handbook finalized.** **Presented by COSCAP at PBN/TF/7** **CLOSED**

No.	Tasks/Strategy	Category	Status
A6/8	States are encouraged to participate in the PBN Operational Approval Training to be conducted under the auspices of COSCAPs in Singapore on during 26-30 April 2010. Invitation will be issued to select States by COSCAPs.	Education	**Singapore 26 - 30 April** **29 Participants** **11 States** **Brisbane 7 – 11 June** **16 Participants 5 States** **PBN Operational Approval Familiarization Workshop Bangkok, 30-31 August** **23 Participants** **8 States** **CLOSED**
A6/9	ICAO Regional Office to inform IFPP, PBNSG and APANPIRG limitation of older FMS in inputting procedure identification within 6-digit alphanumeric. This limitation occurs when pilots attempt to select specific approach for an airport that has multiple runways and each of runways has multiple approach procedures of the same type of navigation system. ICAO is requested to provide guidance and standardized solution to the issue.	Implementation	**ICAO: The limitation of older FMS only capable of putting 6 digits alpha numeric should be addressed by education and training of pilots.** **It is therefore recommended that PBN ops approval documentation in ICAO is amended to emphasize this issue.** **CNS/MET Draft Conclusion 14/15** **CLOSED**

No.	Tasks/Strategy	Category	Status
DC6/10	The proposed revision to the APAC Regional PBN Implementation Plan as shown in Appendix 'F' of the PBN TF/6 Meeting report be adopted.	Planning	**CNS/MET SG/14 recommended V. 2 be adopted by APANPIRG/21** **CNS/MET Draft Conclusion 14/14** **CLOSED**
DC6/11	ICAO provides guidance on aircraft that do not have a lateral and vertical readout on the navigation display, but do display the lateral and vertical profile on the navigation equipment, could be considered as alternate means of compliance if supplemented by appropriate flight crew training for RNP value of 0.3 RNP or greater.	Implementation	**ICAO: It is agreed that for older aircraft that do not have lateral and vertical readout for RNP 0.3 or greater on the navigation display (ND), alternative means of compliance should be available.** **This will need to be addressed in the PBN manual, and more in detail for the upcoming ICAO guidance material on OPS approval.** **For the Asia-Pacific Region, the PBN Ops Approval Handbook needs to emphasize this aspect as well** **CLOSED** **CNS/Met Draft Conclusion 14/18**

No.	Tasks/Strategy	Category	Status
DC6/12	Request CNS/MET SG, ATM/AIS/SAR SG, and APANPIRG to review and consider amending the APAC Performance Monitoring and Measurement Metrics 2 and 3 for PBN to include specific measurements that capture operational benefits in terms of PBN's ability to help fulfill strategic objectives (safety, efficiency, capacity, access, and the environment).	Planning	**CNS/MET Draft Conclusion 14/19** **CLOSED**
A6/13	ICAO Secretariat to identify the appropriate office or forum that would be best suited to develop a standardized calculation and reporting method for States. This would include a mathematical model to ensure environmental benefit calculations are standardized.	Reporting	**ICAO: ICAO HQ is currently in the process of developing standardized metrics for Environmental benefits obtained from ATM operational improvements including PBN.** **See CNS/MET SG/14 Report. Paras 3.4.83 to 3.4.87** **CLOSED**
D6/14	The PBN TF agrees to integrate its Implementation Task List into the PBN Task Force Task List and updates the PBN Task Force Task List as shown in an Appendix of the Meeting Report.	-	**Closed.** **TASK LIST recommended for adoption by CNS/Met SG/ 14.** **Draft Conclusion 14/14** **CLOSED**
A6/15	ICAO Secretariat to provide an update report on PBN TF activities to ICAO Route Review TF. The PBN TF also requested that activities of the RR TF to be reported to the PBN TF.	Coordination	**On-going**
A6/16	States / Administrations to submit their PBN Implementation Progress Report by 20 February 2010 for onward submission to APANPIRG/21 Meeting.	Reporting	**CLOSED**

No.	Tasks/Strategy	Category	Status
D6/17	The PBNTF agrees in principle to the establishment of a regional RAIM prediction system and cooperation between the ICAO PBN TF and the APEC GIT. Australia, India, Japan and USA also agreed to be part of the project team.	Implementation	**ICAO: The establishment of a regional RAIM prediction system is encouraged, however such a system would only provide conservative predictions based on GNSS stand-alone systems.** **RAIM is namely one of the several methods of integrity monitoring, and aircraft on commercial operations generally are fitted with more advanced predictions systems.** **Although these type of operations could benefit from this relative conservative prediction system, Operators are encouraged to have a service that will address the more advanced GNSS installations so as to improve the dispatch rate.** **Ref. CNS/MET SG/14 Report Para 3.4.69** **CLOSED.**
A6/18	The PBN TF requests AEROTHAI in conjunction with the project team to develop more detailed technical architecture, operational concepts, and administrative arrangements to be reviewed by the Task Force at the PBN TF/7.	Implementation	**On-going** **Working Paper 11** **Report PBN/TF/7**
A6/19	States are requested to develop Working Papers on back up requirements for PBN to be discussed at the PBN TF/7 Meeting.	Planning	**States.** **On-going**

No.	Tasks/Strategy	Category	Status
A6/20	Working Paper PBN/TF/6 – W/7 be forwarded to the Flight Plan and ATS Messages Implementation Task Force (meeting now to be held in July 2010).	Coordination	**Forwarded** **CLOSED**
A6/21	States be requested to review the requirements of the State Letter on the implementation of the interim 2012 flight plan format in the context of PBN implementation and report to the PBN TF 7 meeting issues noted.	Implementation	**States** **CLOSED**

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Appendix: The Minimum Technical and Operational Requirements for a Regional RAIM Prediction System

Basic Common Denominator - Noting the differences among different RAIM algorithms on-board different aircraft, a regional RAIM prediction system provided by a service provider, such as an ANSP, should provide a "basic common denominator" RAIM prediction service for "basic" GNSS receivers, such TSO-129 (Fault Detection) and TSO-145/146 (Fault Detection and Exclusion).

Prediction Period – A regional RAIM prediction system shall provide prediction for RAIM outage and number of GNSS-satellite availability for a 72 hour period using the latest available GPS NANU.

*Approach Operation*s - A regional RAIM prediction system shall support aircraft approach operations based on RNP APCH (with/without Baro-VNAV) navigation specification. The system shall calculate the predicted RAIM availability for a 72 hour period for specific Aerodromes. The algorithms shall address the RAIM requirements for GNSS receivers operating in Approach operations (±0.3NM). Both the Fault Detection (FD) and Fault Detection and Exclusion (FDE) algorithms shall be provided. The system shall calculate the predicted RAIM availability at the Aerodrome Reference Point (ARP) for baro (pressure altitude) aided and non-baro aided GNSS user equipment at 1 minute intervals or better.

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UPDATE TASKS LIST – PBN Task Force

No.	Tasks/Strategy	Category	Status
C4/1	The APAC PBN TF encourages States to consider the GO Team visit.	Implementation	**On-going.** States are encouraged to consider the GO Team visit as required. **Status:** **From 25-27 August 2010, the first ICAO/IATA PBN Go-Team was successfully conducted in Thailand.** **PBN/TF/7–IP/6 provides the details of the visit.**
C4/2	The APAC PBN TF requests the Global PBN Task Force to consider providing assistance to States which currently are at the early stage of PBN implementation.	-	**Closed.**
C4/3	The APAC PBN TF agrees to provide progress report of PBN implementation in the Asia-Pacific to the Global PBN Task Force	-	**Closed.** The PBN TF has provided progress report to the Global PBN Task Force.
C4/4	The APAC PBN Task Force requested that the Interim Edition (V '0.2') of the Regional PBN Implementation Plan be presented at theATM/AIS/SAR/SG/19 Meeting (June 22-26, 2009) for review as required by APANPIRG/19.	-	**Closed.**

No.	Tasks/Strategy	Category	Status
C4/5	The APAC PBN TF agrees to continue an annual review of the Asia-Pacific Regional PBN Implementation Plan	Reporting	**Routine** **<u>Status</u>** **PBN/TF/6 reviewed APAC Regional Implementation Plan.** **CNS/MET/SAR SG/14 recommended adoption of V. 2 by APANPIRG/21**
A4/6	Develop an up-to-date archive of all relevant guidance materials for each PBN implementation step as outlined in the PBN manual	-	**Closed.** Information on relevant guidance materials is currently available and can be downloaded from ICAO PBN web site. (http://www.icao.int/pbn) The Secretariat also provided a CD containing important PBN guidance and resource materials.
A4/7	Arrange future annual PBN implementation seminars to serve as a forum for exchanging expertise and implementation experiences and invite interested States who would like to host future seminar to make a formal proposal at the next PBN TF meeting and to invite industry representatives to attend the seminar	Education	**On-going.** The PBN TF/5 accepted Hong Kong's offer to host the second PBN Seminar, planned for Feb 2010, subjected to APANPIRG approval. **<u>Status:</u>** **Vietnam and Thailand have offered to host future PBN seminars.**
C4/8	In respect to the request by COSCAPs regarding the development of guidance material for APV, the APAC PBN TF recognized the work currently being conducted by the Global PBN TF to develop and review materials on the issues of APV and Non-Precision Approach as related to PBN	-	**Closed.**

No.	Tasks/Strategy	Category	Status
C4/9	The ICAO APAC PBN TF recommends that the PBNSG continue to review and revise the PBN Manual to achieve a more hierarchical and easily used structure to minimize the number and complexity of the airworthiness approvals required for PBN operations. The GPBNTF is considered to be an organization well placed to advise ICAO Regions on harmonization and the development of common standards	-	**Closed.** PBNSG noted the request from the APAC PBN TF. Materials and suggestions on structure of the PBN manual have been forwarded to PBN SG. Updated version of the PBN manual would be available in the second quarter of 2010.
C4/10	The APAC PBN TF agrees to continue coordination with other regional PBN task forces and the Global PBN Task Force to ensure harmonization of PBN implementation	Planning	**On-going.** Report on Global PBN Task Force activities are presented and noted by PBN TF/5.
A4/11	States are requested to provide progress report regarding PBN implementation at each Task Force meeting	-	**Closed.** Transferred to Action Item 5/08
A4/12	Mandate States to present their PBN Implementation Plan and to provide progress reports on the development of the State Plan at the each PBN TF meeting	Planning	**Routine.** States are requested to provide report on the developments of State PBN Implementation Plans. **Status:** **As of 31 August 2010** **21 State Plans received.** **Plans reviewed and comments being provided.** **After PBN/TF/6 Progress Reports provided by 9 States**
A4/13	Request the Task Force Chairperson and Rapporteurs to develop a common template for State PBN Implementation Progress Report to be reviewed by the next PBN TF meeting	-	**Closed**. The TF/5 agreed on the report template.

No.	Tasks/Strategy	Category	Status
C4/14	The APAC PBN TF agreed to develop a regional PBN progress report to be reported annually to CNS/MET and APANPIRG and to be posted on ICAO APAC and ICAO Global PBN web site	Reporting	**Routine.**
A4/15	Request ICAO Headquarter to provide a presentation on the requirement for safety assessment for PBN implementation and overview of how to conduct proper safety assessment at future PBN TF meetings	Education	**On-going**. The TF referred to the PBN SG for the development of safety assessment criteria. **Status**: **Issue Form sent to HQs** **ANC Action:** **To address this PBN issue through appropriate ANC Panels and Study Groups**
C4/16	The APAC PBN Task Force considers itself a suitable forum to facilitate and harmonize terminal and en-route PBN implementation in the Asia Pacific Region. Therefore, the Task Force requests APANPIRG to consider adding the following task into the Task Force's TOR. "*Facilitate and coordinate the harmonized implementation of PBN for terminal and en-route applications in the Asia Pacific Region*"	-	**Closed.** APANPIRG/20 has a decision to establish a Route Review Task Force.
A4/17	Recognizing that the PBN planning activities for the Asia-Pacific are nearing completion and acknowledging the Task Force's willingness to support actual PBN implementation, the APAC PBN Task Force request working papers regarding revision of the Task Force's work structure to be submitted for consideration at PBN TF/5. Members of the PBN TF are encouraged to coordinate intersessionally to prepare the working papers.	Implementation	**On-going.**
A4/18	Request ICAO to provide status report of the work by PBNSG, SASP and IFPP	-	**Closed.**
C5/01	Confirmed the likely inability of many APAC states to meet the APV implementation goals of Assembly Resolution A 36-23 within the required timeframe. The PBN/TF/5 meeting requested that, APANPIRG while taking note of the limitation of many of the APAC States, consider conveying the same to ICAO with the recommendation that the Resolution be reviewed.	Planning	**On-going.**

No.	Tasks/Strategy	Category	Status
C5/02	As the authorized GNSS Service Areas, in which SBAS based APVs may be implemented are very limited in coverage, the PBN/TF/5 meeting requests that APANPIRG consider the feasibility of establishing a regional SBAS capability to support all aircraft types.	-	**Closed.** CNS/MET will consider the feasibility of establishing a regional SBAS capability.
C5/03	That, the concern raised by the US GAO report was noted; and this concern be forwarded to APANPIRG and ICAO HQs.	-	**Closed**. US Government has guaranteed availability of minimum GPS constellation in writing to ICAO HQ.
C5/04	The PBN/TF/5 meeting recommends that the PBN Study Group review the current PBN GNSS reporting and prediction requirements with a view to establishing common implementation rules and technical standards for such requirements.	Implementation	**On-going.** APANPIRG Conclusion 20/37invites ICAO to develop the guidance materials. **Status:** **Issue Form raised** **ANC Action:** **To address these PBN issues through appropriate ANC Panels and Study Groups.**
C5/05	That, APANPIRG consider tasking the PBN TF with examining the feasibility of establishing a regional RAIM prediction system.	-	**Closed.** APANPIRG Conclusion 20/38 tasks the PBN TF with examining the feasibility of establishing a regional RAIM prediction system.
C5/06	That, the PBNSG consider the proposal to develop Guidance Material that provides a means to assign PBN capability to GPS IFR aircraft in the first instance without the need for recertification.	Education	**On-going.** APANPIRG Conclusion 20/37invites ICAO to develop the guidance materials. **Status:** **Issue Form raised**. **Same as C5/04**

No.	Tasks/Strategy	Category	Status
C5/07	That, States distribute the RNAV safety message and emphasize on all operators involved in RNAV to apply the lessons learnt on Human Factor issues, as discussed in the paper presented by New Zealand on RNAV Human Factors and System Safety.	-	**Closed.** APANPIRD Conclusion20/39 distributes the Report to the States for further distribution to all operators.
C5/08	That, States / Administrations be requested to use the PBN Implementation Progress Report Template for all future reporting on their status of PBN implementation. The Report should be submitted at each of the future PBN Task Force Meeting.	Reporting	**Routine.**
C5/09	That, States / Administrations be requested to submit their PBN Implementation Progress Report by 15 August 2009 for onward submission to APANPIRG/20 Meeting scheduled to be held from 7 – 11 September 2009.	-	**Closed.**
C5/10	That, the APAC Regional PBN Implementation Plan (Interim Edition Version 0.3) be presented at the APANPIRG/20 for approval.	-	**Closed.** APANPIRG Conclusion 20/41 adopted the APAC Regional PBN Implementation Plan (Interim Edition Version 0.3) as Version 1.0
C5/11	That, APANPIRG consider in conjunction with the proposal to establish a SEA RR/TF, acquiring the necessary resources to establish a Regional PBN Office or a dedicated Project to design PBN based regional air routes and facilitate their adoption by the States in the APAC region.	-	**Closed.**
C5/12	That, the PBNSG be requested to provide guidance on any PBN-specific aspects of en route safety assessment.	Education	**On-going.** **Status:** **Issue Form raised.** **Same as C5/04**
C5/13	That, presentation(s) on Safety Assessment be included in the Agenda for the PBN Implementation Seminar to be held in Hong Kong in February 2010.	-	**Closed.**

No.	Tasks/Strategy	Category	Status
C5/14	That, ICAO kindly assist with addressing the PBN safety assessment training needs in the region.	Education	**On-going** **Issue Form raised.** **ANC Action:** **To address this PBN issue through appropriate ANC Panels and Study Groups**
C5/15	Urged States to give detailed considerations to the operational need, safety and cost benefits prior to deciding on RNP AR Approach implementation.	-	**Closed.**
C5/16	That, APANPIRG agree to the PBN Task Force activities continuing for two additional meetings in the first half of 2010 using the Task Force's current TORs.	-	**Closed.**
C5/17	That, ICAO be requested to consider providing an annual summary of panel and working group activities to allow proper coordination amongst different groups (PBN/TF/4 Action Item 4/18)	Reporting	**Routine.**
A6/1	States are encouraged to consider implementing CDO in accordance with ICAO CDO Manual Doc 9331 on as many STARs as practicable to enhance fuel efficiency, ease pilot and ATC workloads, and reduce emission and noise.	Implementation	**States.** **On-going**
A6/2	States are encouraged to attend to ICAO PBN Airspace Design Workshop in 19-22 April 2010 to enhance their expertise with airspace design relating to implementation of PBN	Education	**Workshop conducted at SAA, Singapore, 28 June - 1 July 2010** **38 Participants from 15 States and 3 Int'l org.** **CLOSED**

No.	Tasks/Strategy	Category	Status
A6/3	States are encouraged to attend CDO workshop to be hold in Bangkok on the week of March 15 in conjunction with IFPP meeting.	Education	**ICAO Continuous Descent Operations Briefing at Bangkok, 22 Mar 2010** **59 participants** **11 States** **CLOSED**
A6/4	IATA is requested to provide the progress on the development of global database for PBN approval at the PBN TF/7 Meeting.	Implementation	**IATA to provide details** **On-going**
A6/5	States are requested to list the challenges and impediments for PBN implementations to be reported at the PBN TF/7 Meeting.	Implementation	**Routine** **States.** **ROK Paper** **HK Paper** **Safety Assessment**
A6/6	A harmonization analysis report on State PBN Implementation Plans to be developed by IATA and volunteering States (Australia, Hong Kong, New Zealand and Thailand) and reported to the PBN TF/7 Meeting.	Planning	**21 State Plans reviewed** **7 Robust** **5 Marginal** **9 Incomplete** **CLOSED**
A6/7	States are requested to review the draft PBN Operational Approval Handbook and provide feedback at future PBN TF meetings. States are also invited to contribute relevant material to be integrated into the Handbook.	Implementation	**Nil comments received** **Handbook finalized.** **Presented by COSCAP at PBN/TF/7** **CLOSED**

No.	Tasks/Strategy	Category	Status
A6/8	States are encouraged to participate in the PBN Operational Approval Training to be conducted under the auspices of COSCAPs in Singapore on during 26-30 April 2010. Invitation will be issued to select States by COSCAPs.	Education	**Singapore 26 - 30 April** **29 Participants** **11 States** **Brisbane 7 – 11 June** **16 Participants 5 States** **PBN Operational Approval Familiarization Workshop Bangkok, 30-31 August** **23 Participants** **8 States** **CLOSED**
A6/9	ICAO Regional Office to inform IFPP, PBNSG and APANPIRG limitation of older FMS in inputting procedure identification within 6-digit alphanumeric. This limitation occurs when pilots attempt to select specific approach for an airport that has multiple runways and each of runways has multiple approach procedures of the same type of navigation system. ICAO is requested to provide guidance and standardized solution to the issue.	Implementation	**ICAO: The limitation of older FMS only capable of putting 6 digits alpha numeric should be addressed by education and training of pilots.** **It is therefore recommended that PBN ops approval documentation in ICAO is amended to emphasize this issue.** **CNS/MET Draft Conclusion 14/15** **CLOSED**

No.	Tasks/Strategy	Category	Status
DC6/10	The proposed revision to the APAC Regional PBN Implementation Plan as shown in Appendix 'F' of the PBN TF/6 Meeting report be adopted.	Planning	**CNS/MET SG/14 recommended V. 2 be adopted by APANPIRG/21** **CNS/MET Draft Conclusion 14/14** **CLOSED**
DC6/11	ICAO provides guidance on aircraft that do not have a lateral and vertical readout on the navigation display, but do display the lateral and vertical profile on the navigation equipment, could be considered as alternate means of compliance if supplemented by appropriate flight crew training for RNP value of 0.3 RNP or greater.	Implementation	**ICAO: It is agreed that for older aircraft that do not have lateral and vertical readout for RNP 0.3 or greater on the navigation display (ND), alternative means of compliance should be available.** **This will need to be addressed in the PBN manual, and more in detail for the upcoming ICAO guidance material on OPS approval.** **For the Asia-Pacific Region, the PBN Ops Approval Handbook needs to emphasize this aspect as well** **CLOSED** **CNS/Met Draft Conclusion 14/18**

No.	Tasks/Strategy	Category	Status
DC6/12	Request CNS/MET SG, ATM/AIS/SAR SG, and APANPIRG to review and consider amending the APAC Performance Monitoring and Measurement Metrics 2 and 3 for PBN to include specific measurements that capture operational benefits in terms of PBN's ability to help fulfill strategic objectives (safety, efficiency, capacity, access, and the environment).	Planning	**CNS/MET Draft Conclusion 14/19** **CLOSED**
A6/13	ICAO Secretariat to identify the appropriate office or forum that would be best suited to develop a standardized calculation and reporting method for States. This would include a mathematical model to ensure environmental benefit calculations are standardized.	Reporting	**ICAO: ICAO HQ is currently in the process of developing standardized metrics for Environmental benefits obtained from ATM operational improvements including PBN.** **See CNS/MET SG/14 Report. Paras 3.4.83 to 3.4.87** **CLOSED**
D6/14	The PBN TF agrees to integrate its Implementation Task List into the PBN Task Force Task List and updates the PBN Task Force Task List as shown in an Appendix of the Meeting Report.	-	**Closed.** **TASK LIST recommended for adoption by CNS/Met SG/ 14.** **Draft Conclusion 14/14** **CLOSED**
A6/15	ICAO Secretariat to provide an update report on PBN TF activities to ICAO Route Review TF. The PBN TF also requested that activities of the RR TF to be reported to the PBN TF.	Coordination	**On-going**
A6/16	States / Administrations to submit their PBN Implementation Progress Report by 20 February 2010 for onward submission to APANPIRG/21 Meeting.	Reporting	**CLOSED**

No.	Tasks/Strategy	Category	Status
D6/17	The PBNTF agrees in principle to the establishment of a regional RAIM prediction system and cooperation between the ICAO PBN TF and the APEC GIT. Australia, India, Japan and USA also agreed to be part of the project team.	Implementation	**ICAO: The establishment of a regional RAIM prediction system is encouraged, however such a system would only provide conservative predictions based on GNSS stand-alone systems.** **RAIM is namely one of the several methods of integrity monitoring, and aircraft on commercial operations generally are fitted with more advanced predictions systems.** **Although these type of operations could benefit from this relative conservative prediction system, Operators are encouraged to have a service that will address the more advanced GNSS installations so as to improve the dispatch rate.** **CNS/MET SG/14 Report Para 3.4.69** **CLOSED**
A6/18	The PBN TF requests AEROTHAI in conjunction with the project team to develop more detailed technical architecture, operational concepts, and administrative arrangements to be reviewed by the Task Force at the PBN TF/7.	Implementation	**On-going** **Working Paper 11** **Report PBN/TF/7**
A6/19	States are requested to develop Working Papers on back up requirements for PBN to be discussed at the PBN TF/7 Meeting.	Planning	**States** **On-going**

No.	Tasks/Strategy	Category	Status
A6/20	Working Paper PBN/TF/6 – W/7 be forwarded to the Flight Plan and ATS Messages Implementation Task Force (meeting now to be held in July 2010).	Coordination	**Forwarded** **CLOSED**
A6/21	States be requested to review the requirements of the State Letter on the implementation of the interim 2012 flight plan format in the context of PBN implementation and report to the PBN TF 7 meeting issues noted.	Implementation	**States** **CLOSED**
A7/1	The Meeting: a) urged States to provide annual updates on implementation issues and progress made; and b) encouraged States to complete the development of national plans and ensure compliance with the dates indicated in the plan.		
DC7/2	Participation in the Asia-Pacific Flight Procedure Programme States in the Asia-Pacific Region are encouraged to take part in the regional cooperative effort to achieve the safety, access, capacity, efficiency and environmental benefits that are possible with PBN implementation, by joining the Asia-Pacific Flight Procedure Programme (FPP).		
DC14/15	ICAO (IFPP, PBNSG) be invited to note, once again, the importance of the limitation of older generation FMS in storing multiple procedures for the same type of navigation system for a runway. This limitation occurs when pilots attempt to select a specific approach that is not stored in the FMS navigation database. ICAO is requested to consider establishing additional guidance, supplementing existing PANS provisions, and to explore solution(s).		
A7/3	All States with existing PBN implementation plans are requested to review and revise plans as necessary to ensure they are in alignment with the APAC Regional plan and ICAO PBN requirements.		
A7/4	States that are yet to develop their PBN implementation plan are requested to do so in an expeditious manner and submit the same to ICAO APAC Office at the earliest.		

No.	Tasks/Strategy	Category	Status
A7/5	Developing States are encouraged to identify shortfalls and challenges to implementation and inform the APAC PBN Task Force accordingly.		
A7/6	The Secretariat is requested to provide information to ICAO HQs on the review mechanism adopted by the review team, for use in other regions.		
A7/7	The Secretariat is requested to forward Appendix D [APAC Short Term Implementation Target for Continental, Oceanic and Remote Continental Airspace(s)] to PBN/TF/7 – WP/5 PBN State Plan Harmonization Analysis Report to ICAO HQs for information.		
C7/8	States that are further advanced in PBN implementation are encouraged to contribute to regional efforts to accelerate implementation.		
C7/9	The meeting agreed that the principles of the proposed activities of the REDI teams are very beneficial and are in line with ICAO HQ concepts of the GO-TEAM visits that are executed in partnership with IATA and industry partners. It was however the opinion of the meeting that the work of the REDI teams may overlap the work of the Go-teams and it was decided that although in agreement with the principles, further work needs to be done on the management structure, and the relation to the Go-team efforts.		
A7/10	IATA to take the matter to the Airlines Electronics Engineering Committee (AEEC) to see if it can provide an answer/solution.		
DC7/11	Endorsement of Minimum Technical and Operational Requirements for a Regional RAIM Prediction System That, the Minimum Technical and Operational Requirements for a Regional RAIM Prediction System for the APAC Region as shown in Appendix ‘E’ is endorsed.		
DC7/12	Participation on the Regional RAIM Prediction Service for Asia/Pacific Region States in the Asia-Pacific Region are encouraged to take part in the Regional RAIM Prediction System for the APAC Region.		

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