



INTERNATIONAL CIVIL AVIATION ORGANIZATION

**TENTH APIRG ATS/AIS/SAR/SG (ATS/AIS/SAR/SG/10) MEETING
(Dakar, 12-14 May 2009)**

Agenda Item 2: Review of the report of the second meeting of the Performance-based Navigation Task Force (PBN/TF/2)

(Presented by Secretariat)

SUMMARY

This Paper presents the status of the development and preparedness of the implementation of the performance-based navigation, following the second meeting of the Task Force held from 4 to 6 December 2008 in Nairobi, Kenya.

Action by the meeting is at paragraph: 3

References:

- Report of the Sixteenth meeting of the APIRG (APIRG/16)
- Report of the Special Africa-Indian Ocean (AFI) Regional Air Navigation (RAN) meeting (SP AFI 08/RAN)
- Report of the First meeting of the Performance-based Navigation Task Force

1. Introduction

1.1. The Second PBN Task Force (PBN/TF/2) was convened pursuant to APIRG/16 meeting Conclusion 16/2 by the ICAO ESAF Office, Nairobi, from 4 to 6 December 2008. It was attended by seventy (70) participants from 23 States and 6 International Organizations namely; ASECNA, EUROCONTROL, IATA, IFALPA, IFATCA and JEPPESEN.

2. Discussion

2.1. The following Agenda was adopted by the meeting:

- Agenda Item 1: Review and follow-up of the conclusions of the first meeting of the Performance Based Navigation Task Force (PBN TF/1) meeting.
- Agenda Item 2: Review of the activities of the AFI Regional PBN Implementation Plan Work Group.
- Agenda Item 3: Review of the activities of the State PBN Plan Work Group.
- Agenda Item 4: Consideration of PBN matters arising from the Special AFI RAN 08 meeting.
- Agenda Item 5: Any other business

Review and follow-up of the conclusions of the first meeting of the Performance Based Navigation Task Force (PBN TF/1) meeting.

2.2. Under this agenda item, the meeting reviewed and noted the action taken on the conclusions/decisions of the First meeting of the PBN Task Force meeting (Appendix A). It reinstated

conclusions that were still in force and proposed the action to be taken before the next Task Force meeting. These conclusions appear in Appendix A to this paper (Conclusions 2/1 through 2/9).

2.3. The terms of reference of National PBN Programme Managers (NPPMs) are provided in **Appendix B** to this paper. The meeting may wish to appeal to States to designate their NPPMs (Conclusion 2/4).

Review of the activities of the AFI Regional PBN Implementation Plan Work Group

2.4. Under this agenda item, the Task Force adopted the draft AFI Regional PBN Plan, which was included in the final report of the meeting for onward distribution to the States in accordance with the established ICAO practices. (Conclusion 2/10 and decision 2/1).

Review of the activities of the State PBN Plan Work Group

2.5. Under this agenda item the Task Force reviewed the draft State PBN Plan Template document prepared by the Rapporteur of the Work group on the subject. The draft State PBN Plan Template was adopted by the Task Force and included in the report of the meeting for onward distribution to the States in accordance with the established ICAO practices. (Conclusion 2/11).

Consideration of PBN matters arising from the AFI Special RAN meeting

2.6. Under this agenda item the Task Force noted the Special RAN Recommendations: Rec. 6/7, Rec. 6/9, Rec. 6/10, Rec. 6/11, Rec. 6/13 and Rec. 6/17 relating to PBN and developed relevant conclusions aimed at their implementation. (Conclusion 2/12). These recommendations are reproduced below for ease of reference:

Recommendation 6/7 – Establishment of a Tactical Action Group (TAG)

That:

- a) *A Tactical Action Group be created in the AFI Region with the Terms of Reference and Work Programme outlined in Appendix C to the Report on Agenda Item 6; and*
- b) *States as a matter of priority make all efforts to assist and comply with requests from the TAG group.*

Recommendation 6/9 - Performance-based navigation (PBN) performance objectives

That APIRG adopt the Performance Objectives as contained in the performance framework forms in Appendix D to the Report on Agenda Item 6.

- a) *Optimization of the air traffic services (ATS) route structure in en-route airspace;*
- b) *Optimization of ATS route structure in terminal airspace; and*
- c) *Implementation of vertically guided required navigation performance (RNP) approaches.*

That States develop their national action plans to meet the requirements of the regional performance framework forms, as a matter of priority to meet the PBN implementation goals established by Assembly Resolution A36-23.

Recommendation 6/10 - Support for establishment of an African ICAO flight procedure office

That:

- a) *States and international organizations support the implementation of an AFI flight procedures office; and*
- b) *ICAO disseminate a letter, with supporting documentation, inviting interested States and international organizations to submit proposals for establishment and hosting of the FPO.*

Recommendation 6/11 - Implementation of WGS-84 and eTOD

That APIRG adopt the AIM Performance Objective: Implementation of world geodetic system-1984 (WGS-84) and electronic terrain and obstacle data (eTOD) as contained in the performance framework form in Appendix E to the Report on Agenda Item 6.

Recommendation 6/13 - Publication of GNSS-based RNP approach procedures

That:

- a) *States having taken part in the IATA area navigation (RNAV) global navigation satellite systems (GNSS) procedures development and implementation programme and which had not yet done so, publish GNSS-based required navigation performance (RNP) approaches, and at the same time, remove any operational restrictions they may be in place; and*
- b) *States that had not taken part in the IATA RNAV GNSS procedures development and implementation programme, seek assistance from appropriate organizations with the objective of designing and implementing GNSS-based RNP approach procedures.*

Recommendation 6/14 - ICAO assistance with legal and regulatory issues associated with implementation of GNSS approach procedures

That ICAO provide assistance to States in overcoming legal and regulatory difficulties associated with implementation of global navigation satellite systems (GNSS) based approach procedures.

Incorporation of PBN in CNS/ATM

2.7. The Task Force was of the view that APIRG should amend the relevant parts of the AFI CNS/ATM Plan (Doc 003) to incorporate PBN issues (Conclusion 2/13).

Renaming of APIRG PBN Task Force

2.8. Taking into consideration the PBN Task Force assigned objective to ensure that the implementation of the navigation element of the CNS/ATM system is based on clearly established operational requirement, and noting the critical role of GNSS in the implementation of PBN navigation specifications, the meeting agreed to the renaming of the PBN Task Force as AFI PBN/GNSS Task Force (Conclusion 2/16).

Future work programme

2.9. The meeting established two working group to develop PBN regional performance objectives and action plans for en – route, terminal and approach phases of flight operations, in accordance with SP AFI RAN (2008) Recommendation 6/9. (Conclusions 2/14 and 2/15, Decisions 2/2 and 2/3).

2.10. The terms of reference, work programme and composition of the Task Force are shown at **Appendix B** to this paper.

Venue and date of 3rd PBN seminar and 3rd PBN TF meeting

2.11. The 3rd PBN seminar and the 3rd PBN TF meeting were tentatively scheduled in Nairobi in May 2009.

3. Conclusion

3.1. The meeting is invited to:

- a) Note the report on the Second Meeting of AFI PBN Task Force (AFI PBN/TF/2);
- b) Review and endorse AFI PBN/TF/2 conclusions and decisions at **Appendix A**;
- c) Review the terms of reference of National PBN Programme Managers (NPPMs) at **Appendix B**, and remind States of their responsibility to nominate their NPPMs;
- d) Review proposed the terms of reference and composition of the Task Force shown at **Appendix C**.

-END-

AFI PBN/TF/2 - List of Conclusions and Decisions

Number	Title
Conclusion 2/1:	<p>Members of PBN Task Force</p> <p>That the following States and International Organizations shall nominate experts to serve as members of the PBN Task Force: Algeria, Benin, Burundi, Botswana, Cameroon, Cape Verde, Chad, Democratic Republic of Congo (DRC), Egypt, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Mauritius, Nigeria, Rwanda, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Tanzania, Tunisia, Uganda, IFALPA, IFATCA, IATA, ASECNA and Roberts FIR.</p>
Conclusion 2/2:	<p>Conduct of Surveys on aircraft equipage</p> <p>That:</p> <ul style="list-style-type: none"> a) ICAO Regional Offices conduct regular surveys on aircraft equipage within the AFI Region, as part of PBN implementation related activities; and b) ICAO regional surveys on aircraft equipage should be carried out in close coordination with States, IATA and AFRAA.
Conclusion 2/3:	<p>Civil/Military Coordination</p> <p>That in order to ensure the safe and coordinated implementation of PBN in the AFI Region, States should ensure that the military aviation authorities are fully involved in the planning and implementing process.</p>
Conclusion 2/4:	<p>Nomination of National PBN Programme Managers (NPPMs)</p> <p>That States/service providers which have not done so, designate/nominate as soon as possible, but not later than 28 February 2009 a National PBN Programme Manager PBN (NPPM), who will be responsible for ensuring that the proper mechanism be put in place for the effective implementation of PBN.</p>
Conclusion 2/5:	<p>Implementation of PBN in the AFI Region</p> <p>That:</p> <ul style="list-style-type: none"> a) States in the AFI Region ensure that all requirements be met with a view to safely implementing PBN; and b) Implementation of PBN in the AFI Region be harmonized and coordinated with other adjacent Regions.
Conclusion 2/6:	<p>Training of all personnel involved with the implementation of PBN in the AFI Region</p> <p>That:</p> <ul style="list-style-type: none"> a) APIRG PBN Task Force identify training needs in order to assist States with RNAV/RNP implementation in the en-route, terminal, and approach flight phases, taking into account the performance-based navigation (PBN) concept. b) Seminars/Workshops be organized in the Region for training of relevant personnel directly involved in the implementation of PBN namely pilots, controllers, procedures designers, dispatchers, OPS/Air, operators etc; c) ICAO develop training modules on PBN by 31 December 2009 that may be used by States for training; and d) States having difficulties in implementing PBN implementation programme, may either individually or in group explore the possibility of seeking outside expertise.
Conclusion	PBN Legislation

Number	Title
2/7:	That the States include in their legislation and regulations the provisions relating to PBN.
Conclusion 2/8:	<p>Participation of representatives of States involved in PBN approval process</p> <p>That representatives of States involved in the PBN approval process of aircraft operators, be invited to attend the future meetings of the PBN Task Force.</p>
Conclusion 2/9:	<p>Funding of the PBN Implementation Programme</p> <p>That regulatory bodies, operators, service providers and other stakeholders be granted budgetary allocations for acquisitions and other activities necessary for ensuring that all the requirements be met in a timely manner in order to safely implement PBN in the AFI Region.</p>
Conclusion 2/10:	<p>AFI Regional PBN Implementation Plan</p> <p>That:</p> <p>The Regional PBN Implementation Plan at Appendix B is applicable in the AFI Region.</p>
Conclusion 2/11:	<p>National PBN Plan Template</p> <p>That:</p> <ul style="list-style-type: none"> a) States use the National PBN Plan Template at Appendix C in developing their National PBN Plans; and b) States complete their National PBN Plans as soon as possible, but not later than 31 December 2009.
Conclusion 2/12:	<p>Follow up action of Special RAN Recommendations relating to PBN implementation</p> <p>That the PBN Task Force:</p> <ul style="list-style-type: none"> a) Initiate follow up action on the Special RAN Recommendations relevant to PBN shown at Appendix D; and b) Submit to APIRG a report on actions taken.
Conclusion 2/13:	<p>Amendment to the AFI CNS/ATM Plan (Doc.003)</p> <p>That APIRG amend the relevant parts of the AFI/CNS/ATM Plan (Doc.003) to incorporate PBN issues.</p>
Conclusion 2/14:	<p>AFI Region PBN Performance Objectives</p> <p>That in accordance with Special AFI RAN 08 Recommendation 6/9, and in order to provide the direction to the implementation of PBN in the AFI Region in accordance with the ICAO planning framework, the AFI PBN performance objectives be developed based on the performance framework forms (PFFs) at Appendix E to this report.</p>
Conclusion 2/15:	<p>AFI PBN Action Plan.</p> <p>That the APIRG PBN Task Force develop the PBN Action Plan using the material at Appendix F to this report.</p>
Conclusion 2/16:	<p>Renaming of APIRG PBN Task Force</p> <p>That taking into consideration the PBN Task Force assigned objective to ensure that the implementation of the navigation element of the CNS/ATM system is based on clearly established operational requirement:</p> <p>APIRG:</p> <ul style="list-style-type: none"> a) Consider the renaming of the PBN/GNSS Task Force as AFI PBN/GNSS Task Force; b) Amend the terms of reference of the PBN Task Force as at Appendix H to this report; and

Number	Title
	<p>c) AFI GNSS Strategy be amended taking into consideration the AFI Regional PBN Plan developed by APIRG PBN Task Force.</p>
<p>Decision 2/1:</p>	<p>Finalization and Distribution of AFI Regional PBN Plan and National PBN Plan Template That the Secretariat finalize the AFI PBN Regional Plan and National PBN Plan Template developed by APIRG PBN Task Force (as shown in Appendices B and C to this report), and ensure that they are made available to all AFI States as soon as possible, but in any case not later than 28 February 2009.</p>
<p>Decision 2/2:</p>	<p>Establishment of a PBN Task Force Working Group on En-Route Operations That an En-Route Working Group is established with the following members to develop the AFI PBN Performance Objectives and Action Plan for en – route phase of flight operations.</p> <p>Members of Working Group for En-route: Algeria – Benin - Burundi - CapeVerde – DRC – Egypt – Lesotho – Liberia – Mauritius - South Africa – Sudan – Tanzania – Uganda - ASECNA (Rapporteur) - IATA – IFALPA - IFATCA - Roberts FIR.</p>
<p>Decision 2/3:</p>	<p>Establishment of a PBN Task Force Working Group on Terminal and Approach Operations That a Terminal/Approach Working Group is established to develop the AFI PBN Performance Objectives and Action Plan for terminal and approach phases of flight operations.</p> <p>Members of the Working Group for Terminal and Approach: Botswana -Cameroon – Chad – Ethiopia – Ghana – Kenya – Liberia – Nigeria – Rwanda – Senegal - Seychelles (Rapporteur) - Sierra Leone – Tunisia - ASECNA – IATA – IFALPA – IFATCA - Roberts FIR .</p>
<p>Decision 2/4:</p>	<p>Working Methodology That the Task Force will:</p> <ul style="list-style-type: none"> a) Utilize Electronic means to post WPs and IPs prior to meetings; website: www.icao.int/esaf/pbn; b) Post at least one week prior to the meetings on the following ICAO website: www.icao.int/esaf/pbn; c) Conduct paperless meetings as far as possible; d) All correspondence will be via electronic means.

Terms of reference of National Performance-Based Navigation (PBN) Programme Managers

National PBN Programme Managers (NPPMs):

- 1) Are responsible for ensuring that proper mechanisms are put in place for the effective implementation of PBN, including:
 - Establishment of a National PBN Implementation Group.
 - Development of a National PBN Implementation Plan.
- 2) Act as Focal Points and Coordinators of the activities of States' PBN Implementation Groups, including but not limited to the following:
 - a) Study of PBN operations technology and the Global and Regional guidance material.
 - b) Review of the regional air navigation plan and take account of regional ATM objectives and regional ATM requirements in terms of communication, navigation and surveillance elements.
 - c) Coordination with adjacent States.
 - d) Consistent with ICAO's regional air navigation plan, identification of the principal objectives of the State for implementation of CNS/ATM systems.
 - e) Review of the current and planned infrastructures in terms of airports, airspace, air routes, communications, navigation and surveillance elements.
 - f) Assessment of the current traffic density and carry out air traffic forecasts with emphasis on aircraft movements and regional flows of traffic.
 - g) Evaluation of the current ATM system, focussing on route structure, separation standards, equipage, maintenance, operations and procedures in order to identify any weaknesses.
 - h) As a result of gap analyses, development of functional requirements that would result in improvements/benefits both in the short term and the long term, keeping in view users' requirements.
 - i) Establishment of PBN operational objectives and supporting CNS elements that are most suitable for the scenario, taking into account the planning situation in adjacent States, the development status of ICAO guidance material (SARPs, PBN Manual, etc.) and the regional approach to air navigation planning.
 - j) Establishment of implementation time lines for new systems and decommissioning time lines for current ground systems that are not required as a result of the transition to PBN operations.
 - k) Carrying out of cost-benefit analyses to determine the most appropriate plan, using the iteration process.
 - l) Harmonization with the regional plan.
 - m) Formalization and maintenance of the planning document; and initiation of actions for the implementation of PBN.

The composition of the National PBN Implementation Group should include members from participating organizations, such as:

- a) The national administration;
 - b) The regulating agency;
 - c) ATM service provider;
 - d) Airspace users;
 - e) The airport authority;
 - f) Research and development organizations;
 - g) Military authorities, including air defence; and
 - h) Other relevant bodies.
- 3) Participate in, coordinate and provide support to, APIRG PBN Implementation Task Force meetings and assigned tasks..

APPENDIX C

TERMS OF REFERENCE OF THE APIRG
PERFORMANCE-BASED NAVIGATION TASK FORCE (APIRG PBN/TF)
1. Develop as part of the goal of moving towards a performance-based Global ATM System, an AFI Regional PBN implementation plan, based on a gap analysis, in line with the ICAO PBN goals and milestones. This PBN implementation plan must be based on the following objectives and guiding principles.
Objectives:
a) to ensure that the implementation of the navigation item of the CNS/ATM system is based on clearly established operational requirements;
b) to avoid undue multiple equipment on the aircraft and/or multiple systems on ground;
c) to avoid the need for multiple airworthiness and operational approvals for intra- and inter-regional operations; and
d) to explain in detail the contents of the Regional Air Navigation Plan (ANP) and of the Regional CNS/ATM Plan, describing potential navigation applications.
Guiding principles:
a) pre- and post-implementation safety assessments will be conducted to ensure the application and maintenance of the established target levels of safety;
b) continued application of conventional air navigation procedures during the transition period, to guarantee the operations by users that are not RNAV- and/or RNP equipped;
c) the first regional PBN implementation plan should address the short term (2008-2012), medium term (2013- 2016), and long term (2017 and beyond);
d) target date for completion of the first regional PBN implementation plan is December 2008; and
e) input will be considered from all stakeholders in the PBN implementation process.
2. Carry out specific studies, develop guidance material and facilitate training to assist States with RNAV/RNP implementation in the en-route, terminal, and approach flight phases, taking into account the performance-based navigation (PBN) concept, according to the ICAO Strategic Objectives A, C and D, and Global Plan Initiatives (GPI) on this matter (GPI 5, 7, 10, 11, 12, 20, 21).
3. Identify other issues/action items arising from the work of the RNP SORSG or for consideration by the RNP SORSG in order to facilitate regional and global harmonization of existing applications as well as future implementation of PBN operations.
4. Review the States' PBN implementation documentation to ensure regional harmonization and for possible inclusion in ICAO-developed model documentation.
5. Address other regional PBN implementation issues, as needed.
6. The task force should report to APIRG, through the ATS/AIS/SAR Sub-Group, and should brief the CNS Sub-Group.
