

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**FOURTH MEETING OF THE PERFORMANCE BASED NAVIGATION/GLOBAL
NAVIGATION SATELLITE SYSTEM TASK FORCE
(PBN/GNSS TF/4)**

(Dakar, Senegal, 3-6 December 2013)

REPORT

Prepared by the ICAO Western and Central African Regional Office

The views expressed in this Report should be taken as those of the Performance Based Navigation/Global Navigation Satellite System Task Force (PBN/GNSS TF/4) Meeting (Dakar, Senegal, 3 – 6 December 2013) and not of ICAO. This Report will be submitted to the respective States and concerned organizations for necessary action.

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PART I – HISTORY OF THE MEETING

1. PLACE AND DURATION

1.1 The Fourth Meeting of the Performance Based Navigation/Global Navigation Satellite System Task Force (PBN/GNSS TF/4) was held at the ICAO Western and Central African Regional Office (WACAF), Dakar, Senegal from 3 to 6 December 2013.

2. OPENING

2.1 On behalf of the Regional Director, Western and Central African Regional Office, **Mr. François-Xavier Salambanga**, Regional Office Communication, Navigation and Surveillance, WACAF Office welcomed the participants and expressed gratitude to the participating States and organizations on their participation.

2.2 **Mr. Seboeso Machobane**, Regional Officer ATM/SAR, from the ESAF Regional Office also welcomed the participants. He implored all for their understanding on that due to unavoidable logistical reasons, the meeting's daily sessions would be reduced, which would require intensive but speedy work.

3. ATTENDANCE

3.1 The meeting was attended by 39 participants from 13 States and three Organizations. The list of participants is at **Attachment 1** to this Report.

4. OFFICERS AND SECRETARIAT

4.1 The meeting was chaired by **Mr. Hitler Olwenge**, Chief Air Traffic Controller, Kenya Civil Aviation Authority (KCAA). **Mr. Seboeso Machobane**, Regional Officer ATM/SAR, ESAF Office was Secretary of the Meeting, supported by **Mr. François-Xavier Salambanga**, Regional Office Communication, Navigation and Surveillance, WACAF Office. **Mr. Francois Coetzee**, Senior Manager: Aeronautical Information, Air Traffic and Navigation Services (ATNS) South Africa, was the Rapporteur of the meeting.

5. LANGUAGE

5.1 Discussions were conducted in the English language. Documentation was also provided in the English Language.

6. ACTION ITEMS

6.1 The meeting recorded its discussions in the form of report narrative, Conclusions, Decisions and Action Items.

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7. AGENDA

7.1 The meeting adopted the following Agenda:

Strategic Objective	Agenda Item No.	Subject
	1.	Election of a Chairperson and adoption of the Provisional Agenda
A&C	2.	Review and follow-up or Recommendation, Conclusions and Decisions applicable to the Task Force
A&C	3.	Latest developments in PBN and commensurate Regional developments
A&C	4.	Status of implementation of PBN in the AFI Region
A	5.	AFI GNSS Implementation Strategy
C	6.	Update on environmental benefits estimation and reporting
A&C	7.	Performance Framework: Update on PFFs and Metrics
A&C	8.	Review of Terms of Reference (ToR) of the PBN/GNSS Task Force and Work Programme
	9.	Date and Venue of the next meeting
	10.	Any other business (AOB)

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PART II – REPORT ON AGENDA ITEMS

Agenda Item 1: Adoption of the Provisional Agenda and Election of Chairperson and Rapporteur

1.1 The meeting reviewed the provisional agenda forwarded to States and organizations as part of the invitation State Letter. The agenda was adopted without changes, as reflected in paragraph 7 of the History of the Meeting.

1.2 The meeting affirmed its previous agreement that officials elected at the Third meeting of the PBN/GNSS Task Force, Messrs **Hitler Olwenge** (KCAA) and **Harvey Lekamisy** (Madagascar) should serve the Fourth meeting of the Task Force as Chairman and Rapporteur respectively. However, in the absence of **Mr. Lekamisy**, the meeting elected **Mr. Francois Coetzee** as the Rapporteur.

1.3 Mr. Olwenge thanked the members of the Task Force for their continued confidence in his task as Chairman. He highlighted a number of challenges facing States and encouraged the Task Force to do its utmost to address them effectively.

Agenda Item 2: Review and follow-up or Recommendation, Conclusions and Decisions applicable to the Task Force

2.1 The Task Force reviewed the APIRG Conclusions and Decisions applicable to its work and agreed that they continue to serve the intended purposes. However, the meeting proposed updates to the Conclusions/Decisions on development of national PBN Implementation Plans (NPIPs) and on National PBN Programme Managers (NPPMs). Details are discussed under agenda item 4 of this report.

Agenda Item 3: Latest developments in PBN and commensurate Regional developments

3.1 The meeting noted that the Twelfth Air Navigation Conference (AN-Conf/12), Montréal in November 2012 adopted Recommendation 1/1 introducing the revised Fourth edition of the Global Air Navigation Plan (Doc 9750, GANP). The meeting noted that the main feature of Doc 9750 Fourth Ed. is the introduction of the aviation system block upgrades (ASBU) methodology.

3.2 It was also noted that the APIRG/19 meeting, under Agenda Item 5: *Future Work Programme*, discussed WP/27 on the *Impact of the Implementation of the ICAO Aviation System Block Upgrade (ASBU) Methodology on Regional Work Programmes*. APIRG/19 agreed on the restructuring of the working modalities of the Group. To this effect, an extra-ordinary meeting of APIRG is to be convened, most likely in 2014 to adopt a new functional structure.

3.3 The meeting noted that the following ICAO documents had become available and urged States to obtain and use the guidance contained in the documents:

- Manual on the Use of Performance-based Navigation (PBN) in Airspace Design (Doc 9992), First Ed. 2013
- Continuous Climb Operations (CCO) Manual (Doc 9993), First Ed. 2013
- Performance-based Navigation (PBN) Operational Approval Manual (Doc 9997), First Ed. 2013

Agenda Item 4: Status of implementation of PBN in the AFI Region

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4.1 The meeting noted that since the APIRG/18 meeting when only 14 States (Botswana, DRC, Egypt, Ethiopia, Ghana, Kenya, Madagascar, Mauritius, Nigeria, Rwanda, Seychelles, South Africa, Togo and Uganda) had developed and submitted their national PBN implementation plans (NPIPs) to the Regional Offices, no further updates had been received.

4.2 The Task Force also noted that since the APIRG/18 meeting, ICAO had carried out the following activities in support of States' PBN implementation efforts:

- PBN briefing for Directors General in Dakar on 17 September 2012
- PBN Airspace Design Concept workshop from 19 to 23 August 2013 in Johannesburg
- On-the-job (OJT) type of workshops based on two existing and terminal airspaces: Lagos and Johannesburg, from 26-30 August 2013, in in Johannesburg
- PBN Operations Approval Course from 26-30 August 2013, also in Johannesburg
- Launch of AFI Flight Procedure Programme (FPP)

4.3 The meeting discussed the effectiveness of the PBN/GNSS Task Force to deliver on its mandate. In addition, the meeting referred to APIRG/19 WP/27 and noted the envisaged "*Transition from PIRG Meetings to PIRG Projects*." The meeting acknowledged that there had been lack of continuity of the officials representing the States' and organizations membership in the Task Force, and that this had negative impact on the effectiveness of the Task Force. In view of the foregoing, the meeting agreed to propose that membership of the Task Force should comprise individual "officials" nominated by States and organizations. Accordingly, future work programme of the Task Force should be project oriented with resources for the projects being specific experts who are members of the Task Force. The meeting formulated the following Draft Conclusion:

DRAFT CONCLUSION 4/01: MEMBERSHIP OF THE PBN/GNSS TASK FORCE

That, in order to enable the continuity necessary for delivery of the tasks and projects assigned to the PBN/GNSS Task Force, States/ANSPs and organizations should nominate individual officials as members of the Task Force, and enable the nominated officials to participate effectively and consistently in the activities of the Task Force.

4.4 The meeting noted APIRG Conclusion 18/09 calling on States to development their national PBN implementation plans (NPIPs), and deliberated extensively on the continuing delay in the development of NPIPs. The meeting recognized that functionally, it was the responsibility of the ANSPs to develop and implement the NPIPs, while the regulatory authorities should require the plans to be developed. In addition, regulatory authorities should develop enabling regulatory requirements for the implementation of PBN and undertake safety oversight in the provision of services inclusive of PBN implementation. In view of the above, the meeting also recognized the need for regulatory authorities to take necessary measures to ensure that their regulatory technical officials (inspectorate) are conversant with PBN technical and operational requirements.

4.5 The meeting recalled that the NPPM as envisaged by APIRG was not necessarily to be an additional position in the establishment of a State/ANSP, but could be additional responsibilities to an already existing/established position. It was however, important for States/ANSPs to consider that depending on the level of aviation activity and/or stage of PBN development, the volume of work required of the NPPM could be significantly high. The meeting also reflected on the title of NPPM and agreed that the noun "manager" could also be substituted with "coordinator." The Task Force also agreed to propose a revision of the terms of reference of the NPPM. Accordingly, the meeting agreed on the following Draft Conclusion:

**CONCLUSION 4/02: NATIONAL PBN PROGRAMME
MANAGER/COORDINATORS (NPPM/C)**

That, in order to facilitate the implementation of PBN and Regional coordination:

- a) **AFI States that have not already done so nominate/designate NPPM/Cs as soon as possible and assign them the terms of reference as at Appendix 4A to the report on agenda item 4.**
- b) **AFI Provide ICAO with the details of the NPPM/C including contact information, as well updates on such information whenever changes have been made.**
- c) **ICAO Regional Offices send periodical reminders to States.**

(This Draft Conclusion is to supersede APIRG Conclusion 17/58)

4.6 The PBN/GNSS TF/4 meeting also formulated the following Draft Conclusion, which is proposed to supersede APIRG Conclusion 18/09:

CONCLUSION 4/03: NATIONAL PBN IMPLEMENTATION PLANS (NPIPS)

That in pursuant to Assembly Resolution A37-11 on PBN Implementation, States:

- a) **That have not already done so, take necessary steps to enable the air navigation service providers (ANSPs) providing services in the States, to develop Draft NPIPs for consideration by the State authorities and acceptance/approval as a matter of urgency.**
- b) **Consider the use of PBN national plan template and other guidance developed within the framework of APIRG.**
- c) **Ensure that the plan is adopted as part of the State/ANSP strategic plan in order that it may receive the necessary executive commitment including implementation resources and monitoring.**
- d) **Provide updates to ICAO on the status of the plan and its implementation.**

(This Conclusion is to supersede APIRG Concl. 17/09)

Note:

(1) The highlight is used to reflect key changes from Concl. 17/09

(2) Where States' PBN implementation plans and other information on the status of implementation of PBN have been published on a State/ANSP website, the update referred to under bullet d) of the Conclusion may be provided by informing ICAO about such website and indicating whenever changes thereto have been made

4.7 The meeting discussed the issue of updating the AFI CNS/ATM Implementation Plan (Doc 003) and noted that under the new planning methodologies and supporting documents, other documents, such as the electronic Air Navigation Plan would be taking the place of Doc 003.

4.8 The matter of information on aircraft equipage to support planning was also discussed. It was noted that measures had been taken within the framework of APIRG in coordination with States, to obtain equipage information from air operators other than members of IATA.

4.9 The Task Force agreed on the following actions to improve implementation progress:

- a) Support outcome of the APIRG/19 meeting, that workshops similar to the ones held in Johannesburg in August 2013 should be held to cover remaining States

- b) The Task Force should undertake implementation assistance projects
- c) The FPP should participate effectively in the Task Force project

4.10 The meeting recognized that since the template that had been developed for use in developing NPIPs was in the English language, it was not usable for some States in which French was the ICAO official language used. The Task Force agreed to explore means to translate the template into the French language.

4.11 Under discussion on WP/11 of the PBN/GNSS TF/4, the meeting noted the progress made by the PRND Working Group with regard to fuel efficient PBN routes. The meeting endorsed the criteria established by the Working Group for route development and noted the routes under development at **Appendix 4B** and **Appendix 4C** (long distance tracks).

4.12 In addition to the meeting's Conclusions and Decisions, further actions were identified reflected in the Action List at **Appendix 4D** to the report on agenda item 4.

Agenda Item 5: AFI GNSS Implementation Strategy

5.1 The meeting was provided with the outcome of the ICAO 12th Air Navigation Conference held in Montreal, Canada from 19 to 30 November 2012 related to GNSS.

5.2 The meeting was briefed on the evolution of the core constellation in particular the current deployment by United States of a modern global positioning system (GPS) satellites with L1C/A and L5 signals and improved military encrypted signals that will enable civil and authorized State aircraft with modernized equipment to remove ionosphere induced errors and take advantage of increased performance and robustness.

5.3 The meeting was updated on the evolution of the Russian Global Navigation Satellite System (GLONASS) operating with a stable constellation of twenty-four GLONASS-M satellites, with additional back-up satellites and on the ongoing work to develop a new generation of GLONASS-K satellites.

5.4 The meeting also noted the progress made by the European Union in the development of **Galileo** planned to be fully deployed in 2020 and the development of the China **BeiDou**, GNSS constellation system planned to be fully operational on 2020.

5.5 The meeting considered **Recommendation 6/5 (ICAO work programme to support global navigation satellite system evolution)** of ICAO 12th AN Conference requesting ICAO to undertake a work programme to address interoperability of existing and future global navigation satellite system constellations and augmentation systems, identify operational benefits to enable air navigation service providers and aircraft operators to quantify these benefits for their specific operational environment and continue the development of Standards and Recommended Practices and guidance material for existing and future global navigation satellite system elements and encouraging the development of industry standards for avionics.

5.6 The meeting noted **Recommendation 6/6 (Use of multiple constellations)** of the Conference calling upon States to take advantage of the improved robustness and availability enabled by multiple global navigation satellite system constellations and associated augmentation systems and encouraging them to publish information specifying the GNSS elements they approve for use in their airspace and to adopt a performance-based approach with regard to the use GNSS.

5.7 The meeting was provided with the outcome of the 12th Air navigation conference related to the Ionospheric Effects on GNSS Aviation Operations. Emphasis was made on Recommendation 6/9 (*Ionosphere and space weather information for future global navigation satellite system implementation*) of the Conference requesting ICAO to coordinate regional and global activities on ionosphere characterization for global navigation satellite system implementation and States to consider a collaborative approach to resolve ionospheric issues including ionospheric characterization for cost-effective, harmonized and regionally suitable GNSS implementation.

Based on the above provision the following conclusions were formulated:

CONCLUSION 4/04: REVIEW OF THE AFI GNSS STRATEGY IN LINE WITH THE RECOMMENDATIONS OF ICAO 12th AN-CONFERENCE

That:

When reviewing and implementing the AFI GNSS strategy and Plan AFI States consider the advantage of the improved robustness and availability enabled by multiple GNSS constellations and associated augmentation systems and develop the appropriated relevant regulation for cost effective use of core and augmented GNSS.

The meeting was briefed on APIRG meetings relevant conclusions and decision since APIRG/16 meeting. Focus was made on the last APIRG/19 Conclusion 19/28 (*Assessment of GNSS vulnerabilities*) and Conclusion 19/29 (*Impact Analysis of the implementation of GNSS/SBAS in the AFI Region*)

5.8 The meeting was informed on the main components of the AFI Air Navigation System Implementation Action Plan consisting in the implementation of ICAO Aviation Systems Blocks Upgrades (ASBU) applicable block 0 Modules.

It was agreed that the timelines of the AFI GNSS strategy and Plan should be aligned with those related to the implementation of GNSS contained in the action Plan.

The following conclusion was formulated:

CONCLUSION 4/05: Alignment of the timelines of the AFI GNSS Strategy with those related to the implementation of GNSS elements under ASBU Block 0 Module B0-APTA

That:

The timelines of the AFI GNSS Strategy be aligned with those related to the implementation of GNSS elements under ASBU Block 0 Module B0-APTA as contained in the Regional Air Navigation System Implementation Action Planning line with the Global Air Navigation Plan Technology Roadmap for air navigation systems.

5.9 The Task Force consider the composition of the participants and noted the low pace of attendance of engineers to its sessions.

The meeting noted also that the current organization of the Task Force sessions does not give enough opportunity for technical consistent consideration and discussion on GNSS technology although important topics such as GNSS vulnerabilities risen up by the ICAO 12th Air Navigation Conference need to be addressed.

It was proposed that the future meetings of the Task Force be organized with two specialized sessions on PBN and GNSS with a plenary session.

Agenda Item 6: Update on environmental benefits estimation and reporting

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6.1 The meeting reviewed APIRG Conclusion 18/57: *Development of Action Plans on CO₂ Emissions Reduction Activities*, Conclusion 18 /58: *Estimations and Reporting of Operational Benefits*, and Decision 18 /59: *Incorporation of Operational Benefits Tasks in the PRND WG Terms of Reference*. It was also noted that ICAO would be exploring the provision of a Workshop that would include the use of the ICAO Fuel Savings Estimation Tool (IFSET) to enable its effective use by States.

6.2 The meeting noted that however that, the IFSET application was designed to be accessible without much training, and States may proceed to familiarize themselves with the application without necessarily awaiting the workshop. It was agreed that members of the Task Force should proceed to download the IFSET application and familiarize themselves with its use. Members of the PRND Working Group should do the same.

6.3 The meeting also noted that the revised terms of reference of the PRND Working Group (Ref. WP/6 Appendix 6A) to include tasks on environmental protection, and the updated route catalogue template (AARC) (Ref. WP/11 Appendix 11C), had been approved by APIRG/19.

Agenda Item 7: Performance Framework: Update on PFFs and Metrics

7.1 The meeting noted that an ICAO *Regional Workshop on the Aviation Systems Block Upgrade (ASBUs) Methodology for Planning, Implementation and Monitoring of Air Navigation Systems*, was held in Nairobi, Kenya, 21-25 October 2013. The Workshop commenced the use of the Air Navigation Reporting Forms (ANRFs) by populating them with information from the Performance Framework Forms (PFFs) and updating the information to align activities with the ASBUs Modules applicable to PBN: B0 APTA, B0 FRTO, B0 CCO and B0 CDO. The Task Force undertook further updates on the material from the ASBUs Workshop as at **Appendix 7A** to the report on agenda item 7.

Agenda Item 8: Review of Terms of Reference (TOR) o the PBN/GNSS Task Force and Work Programme

8.1 In view of the ASBUs methodology discussed under various agenda items and discussions in WP/27 of APIRG/19, the meeting proposed update to PBN/GNSS Task Force terms of reference as at **Appendix 8A** to the report on agenda item 8.

Agenda Item 9: Date and Venue of the next meeting

9.1 The meeting agreed that the PBN/GNSS TF/5 meeting should be held in 2014 not less than six weeks before the ATM/AIM/SAR SG/14 meeting. The Task Force however acknowledged that much will be determined by outcome of the restructuring within APIRG, which is to be discussed by the extra ordinary APIRG meeting, possibly in 2014. The Task Force agreed that its members should prioritize assistance projects as opposed to meeting.

9.2 It was agreed that the PBN/GNSS TF/5 meeting would be at the ESAF Regional Office, unless a State in the ESAF area offers to host the meeting.

Agenda Item 10: Any other business (AOB)

10.1 A request was made that the Regional Offices activity plans should be forwarded to States as soon as possible to enable planning including provisions for hosting events.

10.2 On behalf of the Regional Director WACAF Office, Mr. Francois-Xavier Salambanga thanked the all for their active participation in the meeting. He extended the Office's apologies on the logistical constraints that had been experienced by the meeting.

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10.3 The Chairman urged members of the Task Force to work as a team in addressing most of the seemingly perennial challenges impeding PBN implementation in the AFI Region. He said in many cases States are facing similar challenges. As such the sharing of information and expertise would greatly improve progress.

10.4 The Chairman adjourned the meeting on 6 December 2013 at 12:45.

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