



Tenth Meeting of the APIRG Air Traffic Services, Aeronautical Information Services and Search and Rescue Sub-Group
[Dakar, Senegal 13 – 15 May 2009]

- Agenda Item 2:** Review of Special AFI RAN 08 Recommendations pertaining to ATS, AIS and SAR fields.
Agenda Item 8: Review of the ATS route network, including updating of the AFI ANP Table ATS1 (Doc7474).

PERFORMANCE – BASED NAVIGATION

(Presented by the Secretariat)

SUMMARY

This paper reviews the Special AFI RAN 08 Recommendations pertaining to Performance – Based Navigation (PBN), and calls for the Sub-group's actions as appropriate.

References:

- ICAO Special AFI RAN 2008 Report.

1. Introduction

- 1.1. This presents the meeting with the Special AFI RAN 08 recommendations pertaining to Performance – Based Navigation (PBN).

2. Discussion

Implementation of performance-based navigation (PBN)

- 2.1. The meeting recalled Assembly Resolution A36-23 that was adopted to support implementation of PBN globally. The resolution urged all States to implement area navigation (RNAV) and required navigation performance (RNP) routes and approach procedures in accordance with the PBN Manual. The meeting recalled that as an early step toward PBN implementation in the AFI Region, pairs of RNP10 routes were implemented in 2006 and 2007 with excellent results.
- 2.2. The meeting agreed that the current RNP 10 routes should be seen as an interim step toward a more appropriate solution that would likely see the implementation of RNP 4 in oceanic and remote areas and RNAV 5 in more dense airspace. In an effort to continue the progress achieved through PBN in the near term, current efforts would continue toward implementation of additional RNP 10 routes in a generally east-west direction.
- 2.3. As a result of the foregoing and to support a structured approach to PBN implementation, the meeting agreed that high-level performance objectives were required. On this basis, the meeting agreed to the following recommendation to guide the work of APIRG on PBN:

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 (See **Appendix A**):

- a) optimization of the air traffic services (ATS) route structure in en-route airspace;
- b) optimization of the 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.

Establishment of a flight procedures office (FPO)

- 2.4. The meeting recognized that many States in the AFI Region lacked the expertise to establish a sustainable internal procedure design capability, meeting the requirements of the Procedures for Air Navigation Services – Aircraft Operations (PANS-OPS, Doc 8168) and to meet their responsibilities in accordance with Annex 15 with respect to the quality of their instrument flight procedures.

- 2.5. The meeting was made aware that most ICAO regions suffered the same difficulties with respect to the new types of flight procedures and that ICAO was working to establish flight procedures offices (FPO) in each region to assist and accelerate the implementation of PBN.
- 2.6. The meeting, while noting that implementation of PBN in the region was important and would yield safety, efficiency and environmental benefits, agreed to the following recommendation:

Recommendation 6/10 — Support for establishment of an Africa 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.

Global navigation satellite systems (GNSS) procedures

- 2.7. The meeting was informed by IATA of a project for the design of GNSS procedures with seventeen southern African States. The meeting was further apprised that only fourteen States had published the procedures. In this context, IATA had requested that States that had not done so, publish the procedures as soon as possible. When discussing this issue, the meeting was informed that regulatory and legal, rather than technical barriers, were keeping some States from publishing the procedures. In this context, the meeting agreed to the following recommendations:

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 that 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.

- 2.8. It was noted that some States having implemented GNSS-based procedures were sometimes failing to maintain their conventional navigational ground aid infrastructure as required. The meeting agreed that States should continue to comply with their obligations to maintain their conventional navigational aids in accordance with their obligations as contained in the AFI ANP.

3. Conclusion

- 3.1. The Sub-group is invited to:

- a) Note SP AFI RAN 2008 Recommendations contained in the paper;
- b) Develop amendment proposals to its future workprogramme to assist APIRG in addressing these recommendations; and
- c) Initiate follow-up action to be taken by APIRG on Recommendation 6/9.

-END-

REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES FOR PBN

REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN EN-ROUTE AIRSPACE				
Benefits				
Environment Efficiency	<ul style="list-style-type: none"> • reduction in gas emissions • ability of aircraft to conduct flight more closely to preferred trajectories • increase in airspace capacity • facilitate utilization of advanced technologies (e.g., FMS-based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency 			
Strategy				
ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AOM	<i>Terminal airspace</i>	2008		
	• develop regional implementation plan	1Q 2008 – 1Q 2009	PBN TF	In progress
	• develop regional action plan	1Q 2009	PBN TF	Not started
	• develop airspace concept based on AFI PBN regional implementation plan, in order to design and implement a trunk route network, connecting major city pairs in the upper airspace and for transit to/from aerodromes, on the basis of PBN, e.g. RNAV 10 and RNAV 5, and taking into account interregional harmonization			
	• harmonize State and PBN implementation plans with regional plan			
	• develop performance measurement plan			
	• formulate safety plan			
	• establish collaborative decision making (CDM) process			
	• publish national regulations for aircraft and operators approval using PBN manual as guidance material			
	• identify training needs and develop corresponding guidelines			
	• formulate system performance monitoring plan			
	• implementation of ATS routes enroute		Region/States	In progress
• monitor implementation progress in accordance with AFI PBN implementation plan and State implementation plan				
linkage to GPIs	GPI/5: performance-based navigation; GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management			

REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES OPTIMIZATION OF THE ATS ROUTE STRUCTURE IN TERMINAL AIRSPACE				
Benefits				
Environment Efficiency	<ul style="list-style-type: none"> reduction in gas emissions ability of aircraft to conduct flight more closely to preferred trajectories increase in airspace capacity improved availability of procedures facilitate utilization of advanced technologies (e.g., FMS based arrivals) and ATC decision support tools (e.g., metering and sequencing), thereby increasing efficiency 			
Strategy				
ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AOM	<i>Terminal airspace</i>	2008		
	• develop regional implementation plan	1Q 2008 – 1Q 2009	PBN TF	In progress
	• develop regional action plan	1Q 2009	PBN TF	Not started
	• develop State PBN implementation	1Q 2009 – 4Q 2009	State	
	• develop airspace concept based on AFI PBN roadmap, in order to design and implement a optimized standard instrument departures (SIDs), standard instrument arrivals (STARs), holding and associated instrument flight procedures, on the basis of PBN and, in particular RNAV 1 and Basic-RNP 1			
	• develop performance measurement plan			
	• formulate safety plan			
	• establish collaborative decision making (CDM) process			
	• publish national regulations for aircraft and operators approval using PBN manual as guidance material			
	• identify training needs and develop corresponding guidelines			
	• formulate system performance monitoring plan			
	• develop a regional strategy and work programme for implementation of SIDs and STARs		State	
• monitor implementation progress in accordance with AFI PBN implementation roadmap and State implementation plan				
linkage to GPIs	GPI/5: performance-based navigation; GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management; GPI/10: terminal area design and management; GPI/11: RNP and RNAV SIDs and STARs; GPI/12: FMS-based arrival procedures			

REGIONAL PERFORMANCE OBJECTIVES/NATIONAL PERFORMANCE OBJECTIVES OPTIMIZATION OF VERTICALLY GUIDED RNP APPROACHES				
Benefits				
Environment Efficiency	<ul style="list-style-type: none"> reduction in gas emissions increased accessibility to aerodromes, including continuity of access increased runway capacity reduced pilot workload availability of reliable lateral and vertical navigation capability 			
Strategy				
ATM OC COMPONENTS	TASKS	TIMEFRAME START-END	RESPONSIBILITY	STATUS
AOM	<i>En-route airspace</i>	2008		
	• develop regional implementation plan	1Q 2008 – 1Q 2009	PBN TF	In progress
	• develop regional action plan	1Q 2009	PBN TF	Not started
	• develop State PBN implementation	1Q 2009 – 4Q 2009	State	
	• develop airspace concept based on AFI PBN implementation plan, in order to design and implement RNP APCH with Baro-VNAV in accordance with Assembly resolution A36-23, and RNP AR APCH where beneficial			
	• develop performance measurement plan			
	• formulate safety plan			
	• establish collaborative decision making (CDM) process			
	• publish national regulations for aircraft and operators approval using PBN manual as guidance material			
	• identify training needs and develop corresponding guidelines			
	• identify training needs and develop corresponding guidelines			
	• implementation of APV procedures	present - 2016	State	
• Formulate system performance monitoring plan				
linkage to GPIs	GPI/5: performance-based navigation; GPI/7: dynamic and flexible ATS route management; GPI/8: collaborative airspace design and management; GPI/10: terminal area design and management; GPI/11: RNP and RNAV SIDs and STARs; GPI/12: FMS-based arrival procedures			
