



**Agenda Item 3: Implementation of performance-based navigation (PBN) in the SAM Region**

**EN-ROUTE (RNAV5) PBN ACTION PLAN**

(Presented by the Secretariat)

Summary	
This working paper presents the en-route (RNAV-5) PBN Action Plan, updated during the Sixth Meeting of the SAM Implementation Group (SAM/IG/6), for its revision and evaluation on the progress reached.	
<b>References:</b> <ul style="list-style-type: none"><li>• Sixth Workshop/Meeting (SAM/IG/6) Report</li><li>• En-route (RNAV-5) PBN Action Plan</li></ul>	
<b>ICAO strategic objectives:</b>	<i>A – Safety</i> <i>D - Efficiency</i>

**1 Background**

1.1 As it may be recalled, the SAM/IG Meetings, in due course reviewed the PBN Implementation Project - En-route short term (RNAV-5) PBN Action Plan for the SAM Region and the associated En-route (RNAV-5) PBN Action Plan. They introduced changes deemed pertinent, established responsible persons and dates for start/end of the different activities and adopted the action plan as guidance material to be followed by States.

**2 Analysis**

2.1 In view that the en-route (RNAV-5) PBN action plan contemplates tasks in charge of the designated persons responsible, with established dates for compliance, a periodical revision is necessary as a follow-up on the status of compliance of the tasks assigned to each one of the persons responsible for the SAM Implementation Group. To this end, **Appendix A** to this working paper shows the tasks that must be complied, on occasion of RNAV-5 implementation, foreseen for 22 September 2011, to be reviewed by this Seventh Meeting.

**3 Suggested action**

3.1 The Meeting is invited to take note of the information provided; and to review the progress reached and if such were the case, update the En-route (RNAV-5) PBN Action Plan shown in **Appendix A** to this working paper.

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## APPENDIX A

**SHORT-TERM EN-ROUTE PBN ACTION PLAN (RNAV-5)  
(GPIs 1, 4, 5, 7, 8, 10, 11, 12, 16, 21, 23)**

<b>1.    Airspace concept</b>	<b>Start</b>	<b>End</b>	<b>Responsible party</b>	<b>Remarks</b>
1.1   Establish and prioritize strategic objectives (safety, capacity, environment, etc.)	June/2008	SAM/IG/2	SAM/PBN/IG (Project RLA/06/901)	Completed
1.2   Collect traffic data in order to understand traffic flows in a given airspace	June/2008	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901)	Completed
1.3   Analyze the navigation capacity of the aircraft fleet	June/2008	SAM/IG/7	SAM/PBN/IG (Projects RLA/06/901 and RLA/99/901) States IATA	Valid 95% of the fleet in the SAM Region is candidate for RNAV5 approval. States should continue their efforts to complete the data base (Conclusion SAM/IG/4-3)
1.4   Analyze ground-based means of communication, navigation (VOR, DME) and surveillance to meet navigation specifications and the navigation reversal mode	June/2008	SAM/IG/7	SAM/PBN/IG (Projects RLA/06/901 and RLA/99/901) States	Valid The work was completed through the support of RLA/06/901 who CNS hired experts. Results are shown in WP/17.
1.5   Optimize airspace structure, reorganizing the network or implementing new routes based on the strategic objectives of the airspace concept, taking into account airspace modelling, ATC simulations (fast time and/or real time), live tests, etc.	SAM/IG/2	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901) States IATA	Transferred. The meeting reviewed this task and decided that it was more appropriate to incorporate to the SAM Region ATS routes network optimization action plan (2.2.5 SAM Region ATS routes network optimization action plan)

<b>2</b>	<b>Safety assessment</b>	<b>Start</b>	<b>End</b>	<b>Responsible party</b>	<b>Remarks</b>
2.1	Prepare safety assessment execution using a qualitative methodology through the application of SMS	SAM/IG/2	SAM/IG/6	CARSAMMA Project RLA/06/901 Regional Office	<b>Completed</b>

<b>3</b>	<b>Establish a collaborative decision-making process (CDM)</b>	<b>Start</b>	<b>End</b>	<b>Responsible party</b>	<b>Remarks</b>
3.1	Coordinate planning and implementation requirements with air navigation service providers, regulators, users, aircraft operators and military authorities	SAM/IG/2	SAM/IG/6	SAM/PBN/IG States	<b>Valid</b> Some States have published an initial AIC. Other States have not done so yet. A new AIC is required informing on the change of implementation date.
3.2	Establish the implementation date	SAM/IG/1	SAM/IG/4	SAM/PBN/IG States	<b>Completed.</b> 18 November 2009 was established as tentative date. States must analyse the feasibility of the tentative date in coordination with domestic operators and military authorities
3.3	Establish the documentation format in the SAM PBN website	SAM/IG/1	SAM/IG/2	SAM Regional Office	<b>Completed</b>
3.4	Report planning and implementation progress to the corresponding Regional Office. Conclusion to present national plans at SAM/IG/4	SAM/IG/2	SAM/IG/4	SAM/PBN/IG States	<b>Completed.</b> Eight SAM States presented a draft of their national PBN implementation plans and it was agreed that for 31 December 2009, States shall present the final version of the plan. The Secretariat was requested to as States that have not done so yet, submit their respective plans.

4 ATC automated systems	Start	End	Responsible party	Remarks
4.1 Assess PBN implementation in ATC automated systems, taking into account amendment 1 to the PANS/ATM (FPLSG).  Note: It is not a requirement for RNAV5 implementation	June/2008	SAM/IG/4	SAM/PBN/IG (Project RLA/06/901)	<b>Completed</b> According to the programme presented in ICAO guidelines (WP/09), it is not a requirement for the RNAV5 implementation. CNS/ATM sub-group will revise this issue.
4.2 Implement necessary changes in automated ATC systems	SAM/IG/2	TBD	States	<b>Completed</b>

5	Aircraft and operator approval	Start	End	Responsible party	Remarks
5.1	Analyze aircraft and operator approval requirements (pilots, dispatchers and maintenance personnel) in keeping with the PBN manual, and develop the necessary documentation.	June/2008	SAM/IG/2	Regional Project RLA/99/901-Regional Safety Oversight Cooperation System	<b>Completed</b>
5.2	Publish national regulations for the implementation of the RNAV-5 navigation specification	SAM/IG/2	SAM/IG/7	States	<b>Valid</b> There are some States in development process of their regulations, and for this reason, this task is pending. Eight States of the Region have published the regulations and 2 States informed that this task is in execution. One State informed that the process had not been initiated. No information is available from 3 States. See WP/06 and WP/21.
5.3	Begin the approval of aircraft and operators	SAM/IG/3	SAM/IG/7	States	<b>Valid</b> This is a continuous task that States have initiated and shall continue to carry out upon requirement of operators. Operators should be encouraged to initiate this process.
5.4	Establish and keep up to date a registry of approved aircraft and operators	SAM/IG/3	Permanent	CARSAMMA States Regional Office	<b>Valid</b> CARSAMMA has received information on approvals of only 71 aircraft and 4 operators from Argentina (19 aircraft and 2 operators) and Colombia (52 aircraft and 2 operators). This is an activity being developed permanently by each one of the States.
5.5	Verify the operation of the continuous monitoring programme (aircraft and procedures)	Sep 2011	Permanent	States	<b>Completed</b> This is an activity being developed

5	Aircraft and operator approval	Start	End	Responsible party	Remarks
					permanently by each on of the States and is considered in the surveillance plans.

<b>6</b>	<b>Standards and procedures</b>	<b>Start</b>	<b>End</b>	<b>Responsible party</b>	<b>Remarks</b>
6.1	Assess and, if applicable, publish the regulations on the use of GNSS.	June/2008	SAM/IG/2	SAM/PBN/IG (Project RLA/06/901) States	<b>Completed</b>
6.2	Finalize WGS-84 implementation	TBD	TBD	States	<b>Completed</b> States which have not done so, should provide the information
6.3	Develop an AIC model to report PBN implementation plans	June/2008	SAM/IG/2	SAM/PBN/IG (Project RLA/06/901)	<b>Completed</b>
6.4	Publish the AIC reporting PBN implementation plans	SAM/IG/2	SAM/IG/4	States	<b>Completed</b> States should publish on 9 April 2009
6.5	Develop an AIP Supplement model containing applicable standards and procedures, including the corresponding in-flight contingencies	SAM/IG/4	June 2010	SAM/PBN/IG (Project RLA/06/901)	<b>Completed</b>
6.6	Develop AIP amendment/AIP Supplement that contains in the part corresponding to ENR 3.3, including information related to RNAV5, as well as limitations as regards sensors applicable and critical radio navigation aids of each route segment	SAM/IG/5	SAM/IG/7	SAM/PBN/IG States	<b>Completed</b>
6.7	Publish the AIP Supplement containing applicable standards and procedures, including the corresponding in-flight contingencies	25 Aug 2011	25 Aug 2011	States	<b>Valid</b>
6.8	Review the Procedural Handbook of the ATS units involved	SAM/IG/5	SAM/IG/7	States	<b>Valid</b>
6.9	Update the letters of agreement between ATS units	SAM/IG/5	SAM/IG/7	States	<b>Valid</b> Several States have updated their LOAs. The process is on going.
6.10	Develop an amendment to regional documentation, if necessary	SAM/IG/3	June 2010	SAM/PBN/IG (Project RLA/06/901)	<b>Completed</b>



<b>6</b>	<b>Standards and procedures</b>	<b>Start</b>	<b>End</b>	<b>Responsible party</b>	<b>Remarks</b>
6.11	Submit a proposal of amendment to Doc. 7030, if necessary	SAM/IG/5	SAM/IG/6	SAM Regional Office	<b>Completed</b>

7. Training	Start	End	Responsible party	Remarks
7.1 Develop a training and documentation programme for operators (pilots, dispatchers and maintenance personnel)	SAM/IG/4	SAM/IG/5	Regional Project RLA/99/901	<b>Completed</b> The matters to be incorporated into each one of the training programmes of operators have been included in the corresponding advisory circulars
7.2 Develop a training and documentation programme for air traffic controllers and AIS operators	SAM/IG/4	SAM/IG/5	SAM/PBN/IG (Project RLA/06/901)	<b>Completed</b>
7.3 Develop a training programme for regulators (aviation safety inspectors)	SAM/IG/4	SAM/IG/5	RLA/99/901 States	<b>Completed</b> The SRVSOP technical committee has proposed a training programme oriented to the authorities
7.4 Conduct training programmes	SAM/IG/5	SAM/IG/7	States	<b>Valid</b> Only some States have initiated this process. In order to conduct the training programmes, States should consider training programme and documentation for ATCOs and AIS operators Conclusion SAM/IG/5-1 and Appendix A to the Report on Agenda Item 3 (SAM/IG/5).
7.5 Conduct seminars for operators, explaining plans and expected operational and economic benefits	SAM/IG/1	SAM/IG/7	States	<b>Valid</b> There is information that only some States have initiated the guidance process to users, and therefore all States are encouraged to implement the dissemination programme among such users.

8. Implementation decision	Start	Responsible party	Remarks
8.1 Assess the available operational documentation (ATS, OPS/AIR)	SAM/IG/7	States	<b>Valid</b>
8.2 Assess the percentage of aircraft and operators (non-exclusionary airspace)	SAM/IG/7	States	<b>Valid</b> It was decided to carry out a new air traffic data collection comprised within the period 1-15 July 2010. The data collection is expected to be revised regarding the amount of aircraft approved through the hiring of one expert by RLA/06/901
8.3 Analyze the results of the safety assessment	SAM/IG/6	States	<b>Completed</b>
8.4 Publish trigger NOTAM	Sep/2011	States	<b>Valid</b>

<b>9. Performance monitoring system</b>	<b>Start</b>	<b>End</b>	<b>Responsible party</b>	<b>Remarks</b>
9.1 Develop a post-implementation en-route operations monitoring programme	SAM/IG/4	SAM/IG/6	SAM/PBN/IG (Project RLA/06/901)	<b>Completed</b>
9.2 Implement a post-implementation en-route operations monitoring programme	Sep 2010	Sep 2011	States	<b>Valid</b>
<b>Pre-operational implementation date</b>	22 September 2011	N/A		<b>Valid</b> SAM/IG/4 defined the tentative implementation date 18 November 2010. It was decided to postpone implementation for 22 September 2011 during SAM/IG/6, since some tasks had not been executed.
<b>Definitive implementation date</b>	Sep 2012	N/A		