



INTERNATIONAL CIVIL AVIATION ORGANIZATION
South American Regional Office - Regional Project RLA/06/901

Assistance for the implementation of a regional ATM system according to the ATM operational concept and the corresponding technological support for CNS
Ninth Workshop/Meeting of the SAM Implementation Group (SAM/IG/9)
(Lima, Peru, 14-18 May 2012)

SAM/IG/9-WP/04
17/04/12

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

**FOLLOW UP OF THE EN-ROUTE PBN (RNAV5) ACTION PLAN AND DEFINITION OF
FUTURE PBN IMPLEMENTATION ACTIVITIES IN THE SAM REGION
PURSUANT TO ICAO RESOLUTION A37-11**

(Presented by the Secretariat)

Summary	
<p>This purpose of this working paper is to allow the Meeting to conduct a final review of the En-route PBN (RNAV5) Action Plan, establish a regional inventory of PBN-based approach procedures and en-route operations, and request States to complete the regional inventory of PBN-based approach procedures and en-route operations.</p>	
References:	
<ul style="list-style-type: none">• Annex 11 to the ICAO Convention;• SAM/IG/8 meeting report;• ICAO Assembly Resolution A37-11; and• Performance-based air navigation implementation plan for the SAM Region – PBIP, Version 1.0	
ICAO strategic objectives:	<i>A – Safety</i> <i>B – Security</i> <i>C – Environmental protection and sustainable development of air transport</i>

1 Background

1.1 As may be recalled, SAM/IG meetings have been regularly reviewing the Project for the Implementation of PBN in En-Route Operations in the Short Term in the SAM Region and the associated regional en-route PBN (RNAV5) action plan, introducing changes as required.

1.2 Likewise, at the SAM/IG/8 meeting, the group assigned responsible parties and start-up and completion dates for the various activities identified, and adopted the action plan to serve as guidance for States to ensure RNAV5 implementation. These actions, involving an effort by SAM States, users, the SAM Regional Office, and Regional Project RLA/06/901, enabled a successful implementation on **20 October 2011**.

1.3 At the SAM/IG/8 meeting, the group decided that the monitoring programme envisaged in the RNAV5 Action Plan should be started after implementation on 20 October 2011. This programme must be executed as foreseen in Conclusion SAM/IG/6-5 (Lateral navigation deviation reporting form – Appendix F to Agenda Item 3 of the final report of the SAM/IG/6 meeting). In this regard, the meeting urged States and operators to complete and send such forms to CARSAMMA on the 10th of each month. Furthermore, States should circulate the forms amongst the operators that use their airspace with a view to their participation in the monitoring programme.

1.4 The meeting also concluded that the monitoring programme should check the percentage of operations conducted by RNAV5-approved aircraft and operators, considering that a full assessment had not been conducted to date. Accordingly, following implementation, Regional Project RLA/06/901 was requested to perform that task.

1.5 Taking into account that the main objective of ICAO is to ensure the safe and efficient operation of the global air navigation system, the Eleventh Air Navigation Conference recommended that ICAO develop GNSS RNAV procedures for both fixed-wing and rotary-wing aircraft, to enable reduced operating minima in environments with numerous obstacles or other limitations.

1.6 The 37th ICAO Assembly urged all States to implement air traffic service (ATS) routes and RNAV and RNP approach procedures in accordance with the ICAO PBN concept as defined in the *Performance-based navigation manual* (Doc 9613).

1.7 Consequently, A37-11, which superseded A36-23, resolved that States develop a PBN implementation plan as a matter of urgency in order to achieve a homogeneous implementation in accordance with the established deadlines and intermediate milestones. **Appendix A-I** to this paper contains a description of the approach procedures, en-route operations, and implementation dates in accordance with Resolution A37-11 and the Regional Performance Objectives (PFF) of the SAM performance-based air navigation implementation plan – PBIP (PFFs are shown in **Appendix A-II**), which shall also be taken into account when developing the PBN Action Plan.

2 Discussion

2.1 This working paper proposes three different activities:

- a) The first activity involves making sure that States have started the monitoring programme foreseen in the RNAV5 Action Plan, following implementation on **20 October 2011**. This programme should be executed as foreseen in Conclusion SAM/IG/6-5 (Lateral navigation deviation reporting form – Appendix F to agenda item 3 of the final report of the SAM/IG/6 meeting). In this regard, the SAM/IG/8 meeting urged States and operators to complete and submit such forms to CARSAMMA on the 10th of each month. Furthermore, States shall circulate the forms amongst the operators using their airspace, with a view to their participation in the monitoring programme.

On that same occasion, the group concluded that the monitoring programme should check the percentage of operations performed by RNAV5-approved aircraft and operators, taking into account that a full assessment of such percentage had not been done to date. Accordingly, following implementation, Regional Project RLA/06/901 was requested to perform such task.

Finally, **Appendices B and C** to this working paper list the tasks that were to be completed by the date of RNAV5 implementation on **20 October 2011**, as reviewed by SAM/IG/8, and which should be considered as “*Completed*”.

- b) In order to check the status of implementation of PBN and to make sure that States comply with the implementation plans defined by the Assembly, the second objective of this paper is to create a regional inventory of PBN-based approach procedures and en-route operations (model presented in **Appendix D**) already implemented or being developed, in order to define action plans that reflect the commitments of States to compliance with Resolution A37-11.
- c) The last activity will be the updating of the PBN action plan in accordance with Resolution A37-11, **Appendix E**, with a view to defining target dates that are consistent with national realities.

3. **Suggested action**

3.1 The Meeting is invited to:

- a) take note of the information provided and review the en-route PBN (RNAV5) action plan shown in **Appendices B and C** to this working paper, with a view to verifying that all tasks have been *Completed*, *Transferred*, or, if *Permanent*, ensure their follow-up;
- b) request States to complete the regional inventory of PBN-based approach procedures and en-route operations (model shown in **Appendix D**);
- c) update the PBN action plan (**Appendix E**), in accordance with Resolution A37-11, **Appendix A-I**, and the Regional Performance Objectives (PFFs) of the SAM Performance-Based Air Navigation Implementation Plan – PBIP (PFFs are shown in **Appendix A-II**); and
- d) review other matters it may deem advisable.

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APPENDIX A

DESCRIPTION OF RNAV AND RNP ATS ROUTES, APPROACH PROCEDURES AND DATES OF IMPLEMENTATION IN ACCORDANCE WITH THE ICAO A37-11

I. A37-11 - Performance-based navigation global goals

Whereas a primary objective of ICAO is that of ensuring the safe and efficient performance of the global Air Navigation System;

Whereas the improvement of the performance of the air navigation system on a harmonized, worldwide basis requires the active collaboration of all stakeholders;

Whereas the Eleventh Air Navigation Conference recommended that ICAO, as a matter of urgency, address and progress the issues associated with the introduction of area navigation (RNAV) and required navigation performance (RNP);

Whereas the Eleventh Air Navigation Conference recommended that ICAO develop RNAV procedures supported by global navigation satellite system (GNSS) for fixed wing aircraft, providing high track and velocity-keeping accuracy to maintain separation through curves and enable flexible approach line-ups;

Whereas the Eleventh Air Navigation Conference recommended that ICAO develop RNAV procedures supported by GNSS for both fixed and rotary wing aircraft, enabling lower operating minima in obstacle-rich or otherwise constrained environments;

Whereas Resolution A33-16 requested the Council to develop a programme to encourage States to implement approach procedures with vertical guidance (APV) utilizing such inputs as GNSS or distance measuring equipment (DME)/DME, in accordance with ICAO provisions;

Recognizing that not all airports have the infrastructure to support APV operations and not all aircraft are currently capable of APV;

Recognizing that many States already have the requisite infrastructure and aircraft capable of performing straight-in approaches with lateral guidance (LNAV approaches) based on the RNP specifications and that straight in approaches provide demonstrated and significant safety enhancements over circling approaches;

Recognizing that the Global Aviation Safety Plan has identified Global Safety Initiatives (GSIs) to concentrate on developing a safety strategy for the future that includes the effective use of technology to enhance safety, consistent adoption of industry best practices, alignment of global industry safety strategies and consistent regulatory oversight;

Recognizing that the Global Air Navigation Plan has identified Global Plan Initiatives (GPIs) to concentrate on the incorporation of advanced aircraft navigation capabilities into the air navigation system infrastructure, the optimization of the terminal control area through improved design and management techniques, the optimization of the terminal control area through implementation of RNP and RNAV SIDs and STARs and the optimization of terminal control area to provide for more fuel efficient aircraft operations through FMS-based arrival procedures; and

Recognizing that the continuing development of diverging navigation specifications would result in safety and efficiency impacts and penalties to States and industry;

Noting with satisfaction that planning and implementation regional groups (PIRGs) have completed regional PBN implementation plans; and

Recognizing that not all States have developed a PBN implementation plan by the target date of 2009:

The Assembly:

1. *Urges* all States to implement RNAV and RNP air traffic services (ATS) routes and approach procedures in accordance with the ICAO PBN concept laid down in the *Performance-based Navigation (PBN) Manual* (Doc 9613);
2. *Resolves* that:
 - a) States complete a PBN implementation plan as a matter of urgency to achieve:
 - 1) implementation of RNAV and RNP operations (where required) for en route and terminal areas according to established timelines and intermediate milestones;
 - 2) implementation of approach procedures with vertical guidance (APV) (Baro-VNAV and/or augmented GNSS), including LNAV only minima, for all instrument runway ends, either as the primary approach or as a back-up for precision approaches by 2016 with intermediate milestones as follows: 30 per cent by 2010, 70 per cent by 2014; and
 - 3) implementation of straight-in LNAV only procedures, as an exception to 2) above, for instrument runways at aerodromes where there is no local altimeter setting available and where there are no aircraft suitably equipped for APV operations with a maximum certificated take-off mass of 5 700 kg or more;
 - b) ICAO develop a coordinated action plan to assist States in the implementation of PBN and to ensure development and/or maintenance of globally harmonized SARPs, Procedures for Air Navigation Services (PANS) and guidance material including a global harmonized safety assessment methodology to keep pace with operational demands;
3. *Urges* that States include in their PBN implementation plan provisions for implementation of approach procedures with vertical guidance (APV) to all runway end serving aircraft with a maximum certificated take-off mass of 5 700 kg or more, according to established timelines and intermediate milestones;
4. *Instructs* the Council to provide a progress report on PBN implementation to the next ordinary session of the Assembly, as necessary;
5. *Requests* the Planning and Implementation Regional Groups (PIRGs) to include in their work programme the review of status of implementation of PBN by States according to the defined implementation plans and report annually to ICAO any deficiencies that may occur; and
6. *Declares* that this resolution supersedes Resolution A36-23

II. TABLES CONTAINING PERFORMANCE FRAMEWORK FORM (PFF)

REGIONAL PERFORMANCE OBJECTIVE: <u>SAM/ATM 01</u> OPTIMISATION OF THE EN-ROUTE AIRSPACE STRUCTURE				
Benefits				
Safety	<ul style="list-style-type: none">Reduces the complexity of the airspace structure, by reinforcing safety			
Environmental protection and sustainable development of air transport	<ul style="list-style-type: none">Reduces fuel consumption and, consequently, CO² emissions into the atmosphere, due to reduction of miles flown and to continuous descent and ascent operationsIncreases airspace capacity.Takes advantage of aircraft RNAV capacity			
Metrics				
<ul style="list-style-type: none">Reduction of air traffic incidents each 100,00 operations per yearIncrease ATC sector capacityReduction of CO² emissions each 100,00 operations per year				
2012 - 2018 Strategy				
ATM OC COMPONENTS	TASKS	PERIOD	RESPONSIBILITY	STATUS
	a) Carry out implementation and assessment of Version 02 of the SAM ATS route network, and the implementation of RNAV 5 exclusionary space.	(*) - 2013	States	Valid
	b) Optimise oceanic routes and complete implementation of RNAV10 (RNP10) routes.	(*) - 2012	States	Valid
	c) Review and update the SAM PBN Roadmap and the ATS route network optimisation programme.	2012 - 2013	Regional Project States	Valid
	d) Assess the status of implementation of the en-route PBN action plan.	2012	States	Valid
	e) Implement a regional tool for RAI availability forecast in order to support en-route, TMA and non-precision approach operations.	2012 - 2015	States	Valid
	f) Prepare Version 03 of the ATS route network, including RNP4 application for oceanic routes and RNP2 in continental airspace.	2015	Regional Project States	Valid
	g) Implement random routes in defined continental airspaces.	2018+	States	Valid
	h) Monitor implementation progress.	(*) - 2018 +	GREPECAS	Valid
Relationship with GPIs	GPI/5: performance-based navigation, GPI/7: management of dynamic and flexible ATS routes, GPI/8: collaborative airspace design and management.			

(*) Indicates that the task has started before the date contemplated in this planning.

REGIONAL PERFORMANCE OBJECTIVE: <u>SAM/ATM02</u> TMA AIRSPACE STRUCTURE OPTIMISATION				
Benefits				
Safety	<ul style="list-style-type: none">• Implementation of continuous descent (CDO) operations• Increased safety during landing and reduced CFIT incidence• Reduction of airspace complexity, by reinforcing safety			
Environmental protection and sustainable development of air transport	<ul style="list-style-type: none">• Reduces fuel consumption and, consequently, CO² emissions into the atmosphere, due to reduction of miles flown and continuous descent and ascent operations;• Reduces aeronautical noise, through continuous descent operations (CDO);• Increases airspace capacity, since it permits the establishment of separate arrival/departure flows, and even the segregation of IFR from VFR flights;• Takes advantage of aircraft RNAV capacity;• Airport arrival/departure under any meteorological condition.			
Metrics				
<ul style="list-style-type: none">• Percentage of international aerodromes with SIDs/STARs, RNAV and/or RNP implemented, when required.• Percentage of aerodromes that have implemented continuous descent and ascent operations.• Reduction of air traffic incidents each 100,00 operations per year• Reduction of tons of CO² emissions each 100,00 operations per year• Reduction of aeronautical noise.				
2012 - 2018 Strategy				
ATM OC COMPONENTS	TASKS	PERIOD	RESPONSIBILITY	STATUS
AOM AUO CM	a) Assess the progress made in the terminal area PBN action plan.	2012	States	Valid
	b) Implement standard RNAV 1 arrival/departure routes in selected TMAs with ATS surveillance.	(*) - 2013	States	Valid
	c) Implement RNAV 1 and/or RNP 1 standard arrival/departure routes in all the TMAs of international airports.	2012 – 2016	States	Valid
	d) Implement CDO operations in all the TMAs of international airports.	2013 - 2018	States	Valid
	e) Implement RNAV1/RNP1 exclusionary airspace in high-density TMAs.	2015 – 2018 +	States	Valid
	f) Monitor progress during implementation.	(*) - 2018	GREPECAS	Valid
Relationship with GPIs	GPI/1: Flexible use of airspace, GPI/5: performance-based navigation, GPI/7: management of dynamic and flexible ATS routes, GPI/8: collaborative airspace design and management, GPI/10: terminal area design and management, GPI/11: RNP and RNAV SIDs and STARs, and GPI/12: functional integration of ground and airborne systems.			

(*) Indicates that the task has been started before the period contemplated in this planning.

REGIONAL PERFORMANCE OBJECTIVE: <u>SAM/ATM 03</u> IMPLEMENTATION OF RNP APPROACHES				
Benefits				
Safety	<ul style="list-style-type: none">Increases safety during landing, reducing the incidence of CFITPermits the establishment of safe approach procedures at airports with limitations due to rough terrain.			
Environmental protection and sustainable development of air transport	<ul style="list-style-type: none">Reduces miles flown and/or permits optimum descent flights, decreasing fuel consumption, and thus CO² emissions into the atmosphere;Takes advantage of aircraft capacity for flying optimum paths;Improved airport operational minima.			
Metrics				
<ul style="list-style-type: none">Percentage of RNP APCH procedures that have been implemented, including APV Baro VNAV and LNAV implemented only at runway ends with instrument operations, according to the 37th Assembly Resolution 37/11.				
2012 - 2018 Strategy				
ATM OC COMPONENTS	TASKS	PERIOD	RESPONSIBILITY	STATUS
AOM AUO AO CM	a) Assess progress of PBN action plan on approach procedures.	2012	SAMIG	Valid
	b) Implement RNP APCH procedures (or RNP AR APCH when operationally advantageous), including APV BARO VNAV, and LNAV only, in conformity with ICAO Assembly Resolution A37/11.	(*) – 2018+	States	Valid
	c) Start-up of the implementation of GLS procedures (GBAS) CAT I landing at selected airports.	2015 – 2018 +	States	Valid
	d) Monitor the progress made during implementation.	(*) - 2018+	GREPECAS	Valid
Relation-ship with GPIs	GPI/1: Flexible use of airspace, GPI/5: performance-based navigation, GPI/8: collaborative airspace design and management, GPI/12: functional integration of ground and airborne systems and GPI/14; runway operations.			

(*) Indicates that the task has been started before the period contemplated in this planning.

APPENDIX B

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

1. Airspace concept	Start	End	Responsible party	Remarks
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	Completed 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	Completed The work was completed through the support of RLA/06/901 who CNS hired experts.
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)

2	Safety assessment	Start	End	Responsible party	Remarks
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	Completed

3 Establish a collaborative decision-making process (CDM)	Start	End	Responsible party	Remarks
3.1 Coordinate planning and implementation requirements with air navigation service providers, regulators, users, aircraft operators and military authorities	SAM/IG/2	SAM/IG/9	SAM/PBN/IG States	<p>Valid</p> <p>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.</p>
3.2 Establish the implementation date	SAM/IG/1	SAM/IG/4	SAM/PBN/IG States	<p>Completed.</p> <p>18 November 2009 was established as tentative date.</p> <p>States analysed the feasibility of the tentative date in coordination with domestic operators and military authorities</p> <p>SAM/IG/4 defined as tentative implementation date 18 November 2010. During the SAM/IG/6 Meeting, it was decided to postpone implementation for 22 September 2011 since some tasks had not been executed. Keeping in mind the need for an additional analysis in terms of VOR/DME coverage and DME/DME for the publication of ENR 3.3, SAM/IG/7 Meeting has made a 28 days adjustment in the date of implementation (20 October 2011).</p>
3.3 Establish the documentation format in the SAM PBN website	SAM/IG/1	SAM/IG/2	SAM Regional Office	<p>Completed</p>
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	<p>Completed.</p> <p>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.</p>

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)	Completed According to the programme presented in ICAO guidelines, 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	Completed

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	Completed
5.2	Publish national regulations for the implementation of the RNAV-5 navigation specification	SAM/IG/2	SAM/IG/7	States	Completed
5.3	Approval of aircraft and operators	SAM/IG/3	Permanent	States	<p>Valid</p> <p>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.</p> <p>States informed that there are still few requests for general aviation aircraft and operators approval</p> <p>States also informed that almost all commercial aircraft and operators (operators 121) are or are about to be approved until the date of implementation.</p>
5.4	Establish and keep up to date a registry of approved aircraft and operators	SAM/IG/3	Permanent	CARSAMMA States Regional Office	<p>Completed</p> <p>During SAM/IG/7 meeting, 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.</p>
5.5	Verify the operation of the continuous monitoring programme (aircraft and procedures)	Sep 2011	Permanent	States	<p>Completed</p> <p>This is an activity being developed</p>

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

6	Standards and procedures	Start	End	Responsible party	Remarks
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	Completed
6.2	Finalize WGS-84 implementation	TBD	TBD	States	Completed 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)	Completed
6.4	Publish the AIC reporting PBN implementation plans	SAM/IG/2	SAM/IG/4	States	Completed 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)	Completed
6.6	Develop AIP amendment/AIP Supplement Model 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	Completed A new format to publish ENR 3.3 routes was approved (Conclusion SAM/IG/6-4 and Appendix D to the Report on Agenda Item 6. Keeping in mind the results presented in task 1.4, at the SAM/IG/7 meeting made the necessary adjustments in the format to publish RNAV routes ENR 3.3 and formulated Conclusion SAM/IG/7-3
6.7	Publish the AIP Supplement containing applicable standards and procedures, including the corresponding in-flight contingencies	22 September 2011		States	Valid 10 States have published the information as per Conclusion SAM/IG/7-3. No information about 4 States
6.8	Review the Procedural Handbook of the ATS units involved	SAM/IG/5	October 2011	States	Valid 4 States indicated that this task is completed. 2 States informed that the task is ongoing. 4 states indicated that the task was not

6	Standards and procedures	Start	End	Responsible party	Remarks
					completed. No information available from 4 States
6.9	Update the letters of agreement between ATS units	SAM/IG/5	October 2011	States	Valid 5 States indicated that this task is completed. 1 State informed that the task is ongoing. 3 states indicated that the task was not completed. No information available from 5 States.
6.10	Develop an amendment to regional documentation, if necessary	SAM/IG/3	June 2011	SAM/PBN/IG (Project RLA/06/901)	Completed
6.11	Submit a proposal of amendment to Doc. 7030, if necessary	SAM/IG/5	SAM/IG/6	SAM Regional Office	Completed

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	<p>Completed</p> <p>The matters to be incorporated into each one of the training programmes of operators have been included in the corresponding advisory circulars</p>
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)	<p>Completed</p>
7.3 Develop a training programme for regulators (aviation safety inspectors)	SAM/IG/4	SAM/IG/5	RLA/99/901 States	<p>Completed</p> <p>The SRVSOP technical committee has proposed a training programme oriented to the authorities</p>
7.4 Conduct training programmes	SAM/IG/5	20 October 2011	States	<p>Valid</p> <p>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). 9 States indicated that the task has been completed. No information available from 5 States.</p>
7.5 Conduct seminars for operators, explaining plans and expected operational and economic benefits	SAM/IG/9	20 October 2011	States	<p>Valid</p> <p>States are encouraged to continue with the dissemination of RNAV5 implementation among such users. 7 States indicated that they have completed this task. 1 State has informed that this task is not applicable. Since there is no national fleet. 1 state informed that the task is ongoing. No information available from 5 State.</p>

8. Implementation decision	Start	Responsible party	Remarks
8.1 Assess the available operational documentation (ATS, OPS/AIR)	October 2011	States	Valid
8.2 Assess the percentage of aircraft and operators (non-exclusionary airspace)	SAM/IG/7	States	Completed Keeping in mind that 95% of the fleet is in a condition for RNAV5 operations approval and that only completion of approval process is pending, the meeting has considered this task as completed. 9 States indicated that they have not completed this work. No information available from 5 States.
8.3 Analyze the results of the safety assessment	SAM/IG/6	States	Completed
8.4 Publish trigger NOTAM	3 October 2011	States	Valid

9. Performance monitoring system	Start	End	Responsible party	Remarks
9.1 Develop a post-implementation en-route operations monitoring programme	SAM/IG/4	SAM/IG/6	SAM/PBN/IG (Project RLA/06/901)	Completed
9.2 Implement a post-implementation en-route operations monitoring programme	October 2011	October 2012	States	Valid
9.3 assess the percentage of RNAV5 approved operations (non-exclusionary airspace)	SAM/IG/8	SAM/IG/9	SAM/PBN/IG (Project RLA/06/901)	Valid
Pre-operational implementation date	20 October 2011	20 October 2012		Valid 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. Keeping in mind the need for an additional analysis VOR/DME and DME/DME for the publication of ENR 3.3, the meeting has made an adjustment of 28 days in the implementation date.
Definitive implementation date	20 October 2012			

APÉNDICE C / APPENDIX C

SEGUIMIENTO DE LAS TAREAS NO FINALIZADAS DEL PLAN DE ACCIÓN RNAV-5 FOLLOW-UP TO THE TASKS NOT COMPLETED IN THE RNAV5 ACTION PLAN

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
3.1 Coordinar necesidades de planificación e implementación con los proveedores de servicio de navegación aérea, reguladores, usuarios, operadores de aeronaves y autoridades militares / Coordinate need for planning and implementation with air navigation service providers, regulators, users, aircraft operators, and military authorities	SI	SI	SI	SI	SI			SI	SÍ	SÍ	O/G		O/G	SÍ	
5.3 Aprobación de aeronaves y operadores/ aircraft and operators approval.	SI	SI	SI	O/G	O/G			N/A	SÍ	SÍ	O/G		NO	O/G	Guyana no cuenta con una flota nacional de aeronaves que requiere aprobación Guyana does not count with national aircraft fleet requiring approval.

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
6.7 Publicar Suplemento AIP que contenga normas y procedimientos aplicables, incluyendo las contingencias en vuelo correspondientes./ publish AIP supplement containing standards and procedures applicable including corresponding in-flight contingencies	SI	SI	SI	SI	SI			SI	SI	SI	SI		SI	SÍ	
6.8 Revisar el Manual de Procedimientos de las unidades ATS involucradas. / Review the procedural manual of ATS units.	SI	SI	SI	SI	NO			O/G	SÍ	NO	NO		NO	SÍ	
6.9 Actualizar cartas de acuerdo entre unidades ATS / Update letters of agreement among ATS units.	SI	SI	SI	SI	NO			O/G	SÍ	NO	NO		SI	SÍ	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
7.4 Conducir programas de capacitación ATCO y Operadores AIS / conduct training programmes for ATCOs and AIS operators	SI	SI	SI	SI	SI			SI	SÍ	SI	SI		SI	SÍ	
7.5 Realizar seminarios orientados a los operadores, indicando los planes y los beneficios operacionales y económicos esperados / carry out seminars oriented to operators indicating plans and operational and economical benefits expected.	SI	SI	SI	SI	SI			N/A	SÍ	SI	O/G		SI	SÍ	Guyana no cuenta con una flota nacional de aeronaves que requiere aprobación Guyana does not count with national aircraft fleet requiring approval.
8.1 Evaluar la documentación operacional disponible (ATS, OPS/AIR) / assess available operational documentation (ATS, OPS/AIR).	SI	SI	SI	SI	SI			SI	SÍ	SI	SI		SI	SÍ	

Conclusión/Tarea Conclusion/Task	ARG	BOL	BRA	CHI	COL	ECU	FGY	GUY	PAN	PAR	PER	SUR	URU	VEN	OBSERVACIONES REMARKS
8.4 Publicar trigger NOTAM / Publish trigger NOTAM	SI	SI	SI	SI	SI			SI	SÍ	SI	SI		SI	SÍ	

Instrucciones para el llenado del formulario - Instructions to fill in the form

- Cumplida: colocar **SÍ** en el casillero correspondiente. / Accomplished: place **YES** in the corresponding box
- En ejecución: colocar **O/G** (on going) e indicar en “observaciones” la fecha prevista de término./ In execution: place **O/G** (on going) and indicate under “remarks” the estimated deadline
- No cumplida: colocar **NO** en el casillero correspondiente y, de ser el caso, hacer comentarios en columna de observaciones/ Not complied: place **NO** in the corresponding box and if such were the case, make comments in the remarks column

OTRAS OBSERVACIONES / OTHER REMARKS	
ARGENTINA	
BOLIVIA	
BRAZIL	
CHILE	
COLOMBIA	
ECUADOR	
FRENCH GUIANA	
GUYANA	

PANAMA	
PARAGUAY	
PERU	
SURINAME	
URUGUAY	
VENEZUELA	

APÉNDICE / APPENDIX D

INVENTARIO REGIONAL DE LOS PROCEDIMIENTOS DE APROXIMACIÓN Y OPERACIONES EN RUTA BASADOS EN LA PBN

PBN IMPLEMENTATION PROGRESS REPORT

Designación del punto Focal PBN por Estado / Designation of PBN Focal Point per State

Estado/Status: (Nominado/a ser nominado) (Nominated/ To be Nominated)

Punto Focal / Focal Point: (Nombre, Cargo, E-mail, teléfono, fax)
(Name, Designation, Mailing Address, Email, Phone, Fax)

Operaciones de aproximación / Approach Operations

RNP APRCH

Fechas límite de Implantación Implementation Targets (# of RWY Ends)						Completado Completed (# of RWY Ends)				En progreso In Progress (# of RWY Ends)			
Y2010		Y2014		Y2016		LNAV		LNAV/VNAV		LNAV		LNAV/VNAV	
a	b	c	d	e	f	g	h	i	j	k	l	m	n

RNP AR APRCH

Fechas límite de Implantación Implementation Targets (# of RWY Ends)						Completado Completed (# of RWY Ends)				En progreso In Progress (# of RWY Ends)			
Y2010		Y2014		Y2016		LNAV		LNAV/VNAV		LNAV		LNAV/VNAV	

RMK: Las fechas límite de implantación toman en consideración la Resolución A37/11 de la Asamblea de la OACI
RMK: The targets take into consideration the Resolution A37/11 of the ICAO Assembly.

Leyenda/Legend:

- 1) En la casilla “a”, ingrese el número de aproximaciones RNP APCH (o RNP AR APCH en la segunda tabla) implantadas hasta el año 2010 / in boxes “a” enter number of RNP APCH approaches (or RNP AR APCH in second table);
- 2) En la casilla “b”, ingrese el porcentaje de aproximaciones RNP APCH (o RNP AR APCH en la segunda tabla) implantadas hasta el año 2010 / in boxes “b” enter percentage of RNP APCH approaches (or RNP AR APCH in second table);
- 3) En las casillas “c” y “e”, para los años 2014 y 2016, ingrese el número de aproximaciones RNP APCH implantadas para esos años / In boxes “c” and “e” for years 2014 and 2016 enter number of RNP APCH approaches implemented for those years;

- 4) En las casillas “d” y “f”, para los años 2014 y 2016, ingrese el porcentaje programado / in boxes “d” and “f” for years 2014 and 2016 enter estimated percentage;
- 5) En las casillas “g” y “i”, ingrese el número de aproximaciones LNAV y LNAV/VNAV ya implantadas /in boxes “g” and “i” enter number of approaches LNAV and LNAV/VNAV already implemented;
- 6) En las casillas “h” y “j”, , ingrese el porcentaje programado de aproximaciones LNAV y LNAV/VNAV / in boxes “h” and “j” enter the estimated percentage of LNAV and LNAV/VNAV approaches;
- 7) En las casillas “g” y “i”, ingrese el número de aproximaciones LNAV y LNAV/VNAV en proceso de implantación / in boxes “g” and “i” enter number of LNAV and LNAV/VNAV approaches in process of implementation ;
- 8) En las casillas “h” y “j”, ingrese el porcentaje programado de aproximaciones LNAV y LNAV/VNAV/ In boxes “h” and “j” enter estimated percentage of LNAV and LNAV/VNAV approaches.

Nota(s): Los Estados pueden incluir información sobre publicaciones recientes de nuevos procedimientos de aproximación PBN.

Note(s): (States may include information on recent publications of new PBN approach procedures.)

Operaciones de Llegada y Salida / Arrival and Departure Operations (SID/STAR)

RMK: mismo procedimiento para llenar los datos/RMK same procedure to fill in data.

Fechas límite de implantación Implementation Targets (# of Int'l Airports)						Completed Completed (# of Int'l Airports)		En progreso In Progress (# of Int'l Airports)	
Y2010	Y2014	Y2016				Arrival	Departure	Arrival	Departure

Fechas límite de implantación Implementation Targets (# of domestic Airports)						Completado Completed (# of domestic Airports)		En progreso In Progress (# of domestic Airports)	
Y2010	Y2014	Y2016				Arrival	Departure	Arrival	Departure

Nota(s): Los Estados incluyen información sobre nuevas publicaciones recientes con llegada PBN/procedimientos de salida incluyendo identificador de aeropuerto.

Note(s) (States include information on recent publications with new PBN arrival/departure procedures, including Airport identifier.)

Operaciones en ruta / En-route Operations

Especificaciones de Navegación Navigation Specification	Completado Completed (# of routes)		En progreso In Progress (# of routes)	
	Domestic	International	Domestic	International
RNAV 10				
RNAV 5				
RNAV 2				
RNP 4				
RNP 2				

Nota(s): Los Estados incluyen información de publicaciones recientes con las nuevas rutas PBN incluyendo los nombres de las rutas.

Note(s): (States include information on recent publications with new PBN routes including the name of the routes.)

Operaciones de descenso continuo (si es applicable) / Continuous Descent Operations/Continuous Climb Operations (If applicable)

Nota(s) (Los Estados pueden incluir información sobre publicaciones recientes con nuevos STARS con CDO)

Note(s): (States may include information on recent publications with new STARS with CDO.)

— end —