International Civil Aviation Organization
South American Regional Office
Eleventh Workshop/Meeting of the SAM Implementation Group (SAM/IG/11) - Regional Project RLA/06/901
(Lima, Peru, 13 to 17 May 2013)

SAM/IG/11-WP/04
24/04/13

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

FOLLOW-UP ON ACTIVITIES OF THE PBN OPERATIONAL IMPLEMENTATION PROJECT

(Presented by the Secretariat)

SUMMARY

This working paper presents a report of the implementation activities concerning Project A1, PBN Operational Implementation in the SAM Region, which requires updating and further development of the scheduled tasks.

REFERENCES:

- Doc 9859, ICAO PBN Manual
- Doc 8733, ANP CAR/SAM
- GREPECAS/16 meeting report
- SAM ANIP/PB
- PBN Implementation Programme

ICAO Strategic Objectives	*This working paper relates to the following strategic objectives:* *A - Safety* *C - Environmental protection and sustainable development of air transport*

1. Introduction

1.1 With a view to the implementation of performance-based regional plans pursuant to the Global Air Navigation Plan and the Global ATM Operational Concept, the GREPECAS/16 meeting approved the modification of the GREPECAS structure. In this sense, it eliminated the AERMET, AGA/AOP, AIM and CNS/ATM Subgroups and their respective Task Forces, converting the work programmes and terms of references of those subgroups into Programmes and Projects. Accordingly, it formulated Decisions 16/45 and 16/47.

1.2 The *"Performance-Based Navigation (PBN)"* programme has the following associated projects:

a) PBN operational implementation; and
b) Air navigation systems in support of PBN (CNS infrastructure)

2. **Discussion**

2.1 Project A1, which deals with PBN Operational Implementation, includes not only PBN implementation but also the optimization of the upper airspace route network, with a view to establishing new RNAV routes or realigning existing RNAV routes, replacing or eliminating conventional routes whose paths coincide or are similar to the proposed RNAV routes or which are not being used by users. Given the scope of this programme, a high level of commitment is required from all stakeholders, whether commercial, military, general aviation, service providers and aeronautical authorities.

2.3 **Appendices A and B** to this working paper contain the Project Description and GANTT template for Project **A1*, PBN Operational Implementation***.

3. **Suggested action:**

3.1 The Meeting is invited to create two *ad-hoc* groups to:

a) Update the Project description and GANTT template of Project A1 contained in Appendices A and B.

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APPENDIX A

PROJECT ON PBN OPERATIONAL IMPLEMENTATION

SAM Region	**PROJECT DESCRIPTION (DP)**	DP N° A1	
Programme	**Title of the Project**	**Start**	**End**
Performance-based navigation (PBN) (Programme coordinator: Roberto Arca Jaurena)	PBN Operational Implementation *Project coordinator: Alexandre Luiz Dutra Bastos (Brazil)*	2011	2018+
Objective	Support the implementation of the project on the optimisation of the ATS route structure in terminal airspace (RNAV SIDs/STARs) and en-route (RNAV), as well as the implementation of RNP approaches, associated to **Result 1.1 of Immediate Objective N° 1 of Project RLA/06/901**		
Scope	The project contemplates planning in three different phases: Phase 1 – Implementation of RNAV5; Phase 2 – Implementation of Version 1 of the SAM ATS route network, and Phase 3 – Implementation of Version 2 of the SAM ATS route network		

Metrics	• Reduction in the number of air traffic incidents for every 100,000 operations per year. • Increase of ATC sector capacity. • Reduction of CO^2 emissions per 100,000 operations per year. • Percentage of international airports with RNAV and/or RNP SIDs/STARs implemented where applicable. • Percentage of international airports with continuous descent and climb operations implemented. • Number of air traffic incidents per 100,000 operations per year. • Tonnes of CO^2 emissions per 100,000 operations per year. • Reduction of aviation noise.
Strategy	Project activities will be coordinated amongst project members, the project coordinator, and the programme coordinator, mainly through SAM/IG meetings. The project coordinator will coordinate with the programme coordinator for the inclusion of additional experts in accordance with the tasks and work to be carried out. States must also review their respective national RNAV route implementation programmes to ensure compatibility with the SAM RNAV implementation programme. Route revision, implementation, modification, or elimination activities are foreseen in the SAM Region in order to continue with the optimisation of the ATS route structure.
Rationale	The 36th ICAO General Assembly requested the Council to encourage Contracting States to improve air traffic efficiency, which will result in emission savings, to report developments in this field, and to expedite the development and implementation of routings and procedures that will enable an efficient consumption of fuel in order to reduce aviation emissions.
Related projects	• Flexible use of airspace. • Improvement of demand-capacity balancing. • Implementation of the new ICAO flight plan format. • Automation.

Project Deliverables	Relationship with the regional performance-based plan (PFF)	Responsible Party	Status of Implementation *	Date of Delivery	Comments
Implementation of Version 1 of the ATS route network based on RNAV, with the required PBN values to respond to the current requirements of airspace users.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		October 2013	The hiring of 2 experts for a period of 3 weeks during the second half of February 2012 has been foreseen to conduct a detailed study of the SAM ATS route network with a view to developing Version 2 of the route network.
Implementation of RNAV5 in the SAM Region	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		October 2011	-
Action plan for the implementation of Version 2 of the ATS route network optimisation programme	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		ATS/RO/3	-
Guidance material for the implementation of the flexible use of airspace concept	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		ATS/RO/4	A new collection of statistical data was deemed advisable to enable the analysis of the evolution of air traffic demand in the Region.
Route implementation and/or realignment proposals based on the FUA	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/7	95% of the SAM fleet is eligible for RNAV5 approval. States must continue doing efforts to complete the database (Conclusion SAM/IG/4-3)

Traffic data to understand airspace traffic flows	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/6	-
Navigation capacity of the fleet	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/9	Information on RNAV5 approval is being sent to CARSAMMA and it is expected that operators and aircraft will be ready by the implementation date (Oct 2011). The navigation capacity database will be completed as foreseen in the SAM/IG/2 and SAM/IG/4 meeting reports (Conclusion SAM/IG/4-3) Pending updating.
List of gateways of the main SAM TMAs	PFF SAM ATM 02	Alexandre Luiz Dutra Bastos		SAM/IG/9	-
Letters of agreement and contingency with adjacent States	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/10	-
Detailed study of the SAM ATS route network with a view to developing Version 2 of the route network	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		April 2012	Hiring of 2 experts for a period of 3 weeks. Period defined: 12-30 March

"*Airspace Modelling*" studies and fast-time simulation to assess the scenarios developed in the detailed study of the SAM ATS route network.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/10	-
Safety assessment of Version 2 of the SAM ATS route network using a qualitative methodology based on the SMS	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/10	States shall conduct a safety analysis of changes in its terminal areas (TMA)
Proposal of amendment to the CAR/SAM Air Navigation Plan	PFF SAM ATM 01 PFF SAM ATM 02	Alexandre Luiz Dutra Bastos		August 2013	-
Drafting of Version 3 of the ATS route network, including the application of RNP 4 for oceanic routes, and RNP 2 for continental airspace	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		2015	Regional project supported by States
Implement random routes in defined continental areas	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		2018+	-
Resources needed	Designation of experts for the execution of some of the deliverables.				

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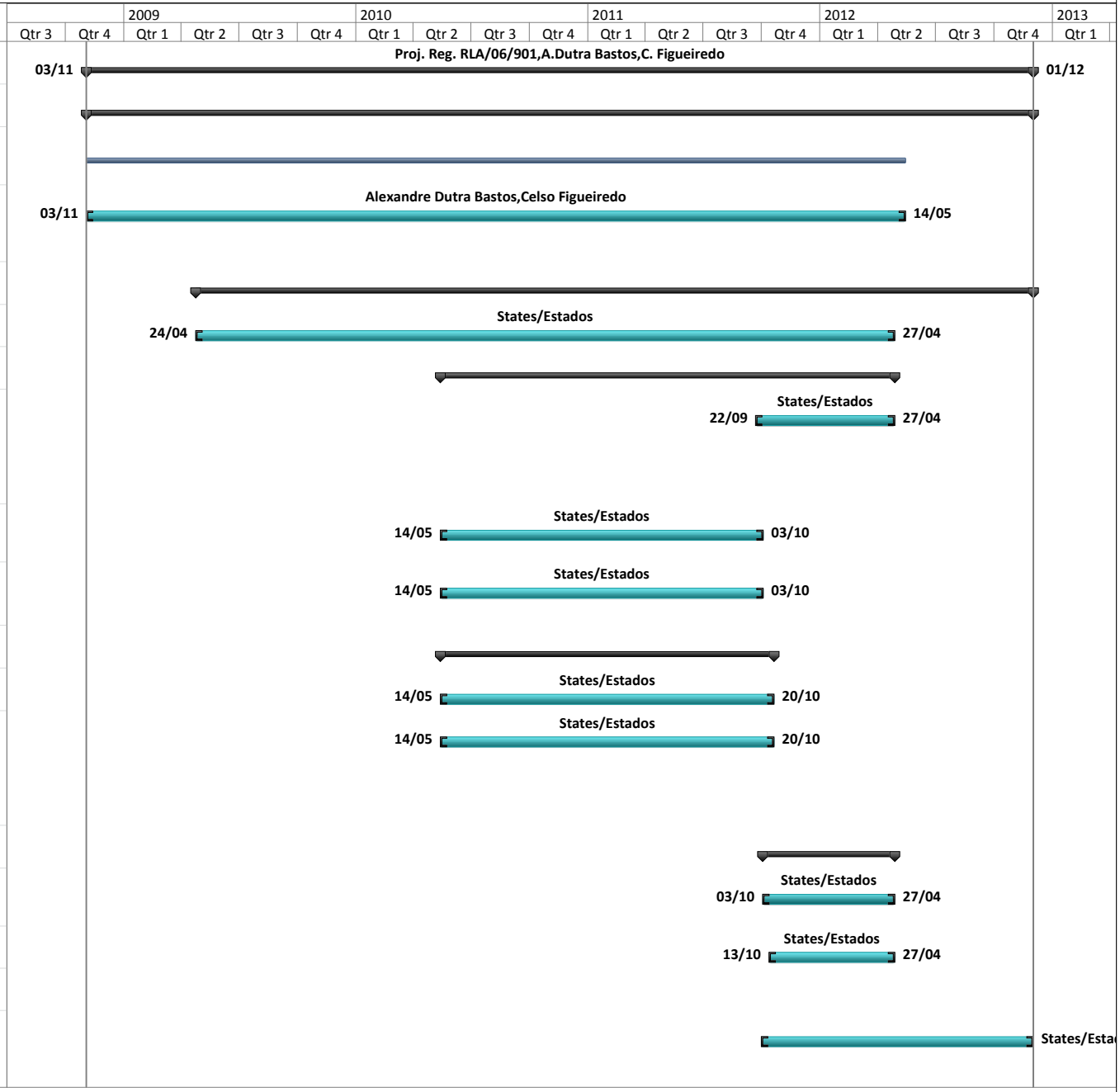
Grey	Task not started yet.
Green	Activity being implemented as scheduled.
Yellow	Activity started with some delay, but expected to be implemented on time.
Red	Activity not implemented on time; mitigation measures are required.

APPENDIX B / APÉNDICE B

PBN OPERATIONAL IMPLEMENTATION PROJECT/PROYECTO IMPLANTACIÓN OPERACIONAL PBN

ID	Task Name	Duration
1	**Implantación operacional PBN/PBN operational implementation**	**1065 days**
2	**RNAV-5 a corto plazo/ RNAV-5 Short term**	**1065 days**
3	**Establecer un proceso de toma de decisiones en colaboración/Establish a collaborative decision-making process (CDM)**	
4	Coordinar necesidades de planificación e implantación. Se requiere nuevo AIC. / Coordinate planning and implementation requirements. New AIC required.	921 days
5	**Aprobación de aeronaves y operadores / Aircraft and operator approval**	**941 days**
6	Aprobación de aeronaves y operadores / Approval of aircraft and operators	786 days
7	**Normas y procedimientos**	**511 days**
8	Publicar Suplemento AIP que contenga normas y procedimientos aplicables, incluyendo las contingencias en vuelo. / Publish the AIP Supplement containing applicable standards and procedures, including in-flight contingencies	157 days
9	Revisar el Manual de Procedimientos de las unidades ATS involucradas / Review the Procedural Handbook of the ATS units	362 days
10	Actualizar cartas de acuerdo entre unidades ATS/ Update the letters of agreement between ATS units	362 days
11	**Capacitación / Training**	**375 days**
12	Conducir programas de capacitación	375 days
13	Realizar seminarios orientados a los operadores, indicando los planes y los beneficios operacionales y económicos esperados/ Conduct seminars for operators, explaining plans and expected operational and economic benefits	375 days
14	**Decisión de implantación/ Implementation decision**	**150 days**
15	Evaluar la documentación operacional disponible (ATS, OPS/AIR) / Assess the available operational documentation (ATS,	150 days
16	Publicar trigger NOTAM / Publish trigger NOTAM	142 days
17	**Sistema de monitoreo de la performance/ Performance monitoring system**	
18	Ejecutar un programa de monitoreo post-implementación de operaciones en Ruta/ Implement a post-implementation en-route operations monitoring programme	307 days



APPENDIX B / APÉNDICE B

PBN OPERATIONAL IMPLEMENTATION PROJECT/PROYECTO IMPLANTACIÓN OPERACIONAL PBN

ID	Task Name	Duration
19	Evaluar el porcentaje de operaciones RNAV5 aprobadas (espacio aéreo no excluyente) / Assess percentage of RNAV5 approved operations (non-exclusionary airspace)	266 days
20	**Fecha de implantación Pre-operacional / Pre-operational implementation date**	263 days
21	**Fecha definitiva implantación / Definitive implementation date**	0 days