Agenda Item 2: SAM airspace optimisation

GREPECAS PROJECT A1 AND OTHER PBN MATTERS

(Presented by the Secretariat)

SUMMARY

This working paper presents the results of the PPRC/2 meeting with respect to GREPECAS Programme A1 (PBN operational implementation) and provides an update on the status of implementation of Basic PANS-OPS Courses in the Region, and future requirements for PBN procedure design courses.

REFERENCES

- PPRC/2 meeting, Lima
- Reports of the workshops/meetings of the SAM Implementation Group

ICAO Strategic Objectives:	*A - Safety* *C - Environmental protection and sustainable development of air transport*

1. **Background**

1.1 The SAM/IG/11 meeting agreed that Project A1 should be terminated and its activities transferred to the SAM Airspace Optimisation Programme, bearing in mind that:

a) Project A1 and the SAM Airspace Optimisation Programme share the same tasks;

b) operational benefits are related to airspace optimisation and not to the application of PBN navigation specifications; and

c) PBN should be considered as a tool for SAM airspace optimisation.

1.2 Furthermore, the SAM/IG/11 meeting felt the need to support States in the implementation of PBN in terminal areas.

1.3 At the second meeting of the GREPECAS Programmes and Projects Review Committee (PPRC/2), held at the South American Regional Office (SAM) on 16-18 July 2013, it was felt that the name of the PBN Programme should be maintained, but the proposal of including the airspace optimisation programme in the PBN Programme was accepted, thus extending the scope of Project A1.

2. **Discussion**

GREPECAS Project A1

2.1 Regarding GREPECAS Project A1, the Secretariat planned a series of deliverables in order to extend the scope of the Project, in accordance with the requirements of SAM/IG/11, to support PBN design of terminal areas by the States, and approval by the PPRC/2 meeting. The deliverables are as follows:

- Prepare and conduct a course/workshop on terminal area design applying PBN.
- Prepare and designate a support team (ST) to assist States that need direct assistance in the implementation of airspace optimisation.
- Develop a planning strategy for terminal area optimisation.
- Develop guides for the design, assessment, and selection of the navigation specification to be applied in TMAs, as applicable.
- Develop procedures for verification and validation of the concept and procedures using risk analysis.
- Identify restrictions for the implementation and development of pre-implementation training guides.
- Action plan for Version 03 of the SAM ATS Route Optimisation Programme.
- Design the tasks required for the implementation of Version 03 of the SAM ATS Route Optimisation Programme.
- Regional strategy and work programme for the implementation of the flexible use of airspace applying a phased approach, starting with a more dynamic sharing of reserved airspace.

2.2 As a second step, it is necessary to identify the parties responsible for the deliverables and the dates of implementation in the Project Description (**Appendix A1)** and in the GANTT template (**Appendix A2)** that are attached to this working paper.

Basic PANS-OPS course for the SAM Region

2.3 The SAM/IG/11 meeting recognised that one of the main problems being faced by some Administrations in the Region is undoubtedly the natural turnover of aeronautical experts, which poses new challenges in terms of training new personnel.

2.4 In this regard, the SAM/IG/11 meeting noted that, in most States, experts lacked training to face PBN implementation with regard to basic procedure design, PBN procedure design, and terminal area design.

2.5 In this respect, the Technical Cooperation section of the Regional Office got in contact with the Administration of Ecuador, which had offered to cover part of the costs of the PANS-OPS course in that country. Ecuador informed that they were making the corresponding internal arrangements. Accordingly, the Office is waiting for the formal request for the acquisition of the course within the aforementioned framework.

PBN procedure design courses

2.6 The States of the Region should also analyse current and future training requirements of their experts in PBN procedure design, and plan the corresponding courses.

3. **Suggested action:**

3.1 The Meeting is invited to:

a) take note of the information provided herein;

b) complete Appendices A1 and A2 to this working paper; and

c) analyse the future need for PBN procedure design courses.

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APPENDIX A1

PBN OPERATIONAL IMPLEMENTATION PROJECT

SAM Region	**PROJECT DESCRIPTION (DP)**	DP N° A1	
Programme	**Title of the Project**	**Start**	**End**
PBN (Programme Coordinator: Roberto Arca Jaurena)	PBN Operational Implementation *Project coordinator: Alexandre Luiz Dutra Bastos (Brazil)*	2011	2018
Objective	Support the optimisation of the South American airspace structure through the optimisation of the ATS route structure in terminal (RNAV/RNP SIDs/STARs) and en-route (RNAV/RNP) airspace, as well as the implementation of PBN approaches pursuant to ICAO Assembly Resolution A37-11.		
Scope	The implementation project contemplates the optimisation of the South American airspace through the implementation of PBN and the application of the flexible use of airspace (FUA) concept, as well as the phased optimisation of the ATS route network of the Region.		
Metrics	• Reduction of CO_2 emissions in tonnes for each route optimisation version. • Percentage of RNAV and/or RNP SIDs/STARs implemented at international airports. • Percentage of continuous descent and climb operations implemented at international airports. • Number of RNAV/RNP routes implemented, realigned and/or eliminated.		

Strategy	The conduction of project activities will be coordinated among project members, the project coordinator, and the programme coordinator, mainly at SAM/IG meetings. The project coordinator will coordinate with the programme coordinator the inclusion of additional experts, if warranted by the tasks and works to be executed. Furthermore, the States must check their respective national RNAV route implementation programme for consistency with the SAM RNAV implementation programme. Activities involving the review, implementation, modification, or elimination of routes in the SAM Region are foreseen in order to continue with the optimisation of the ATS route structure.
Goals	Implementation of Version 02 of the ATS route network, based on RNAV, with the necessary PBN values to meet the current requirements of airspace users by the end of 2014. Strategy for the implementation of the FUA concept. Plan of action for route optimisation version 03 by 2015. 30% of terminal areas optimised at the main international airports by 2016, 50% by 2018.
Rationale	The 36th ICAO General Assembly requested the Council to encourage Contracting States to improve air traffic efficiency resulting in emission savings, to report the progress made in this field, and to expedite the development and implementation of routings and procedures that will permit efficient fuel burn to reduce aviation emissions.
Related projects	• Flexible use of airspace. • Automation. • Air navigation systems in support of PBN.

Project deliverables	Relationship with the performance-based regional plan	Responsible party	Status of Implementa-tion*	Delivery date	Comments
Implementation of Version 01 of the ATS route network, based on RNAV, with the necessary PBN values to meet current requirements of airspace users.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		October 2010	Completed
Implementation of RNAV5 in the SAM Region.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		October 2011	Completed
Action plan for the implementation of Version 02 of ATS route network optimisation.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		ATS/RO/3	Completed

Traffic data to understand airspace traffic flows.	PFF SAM ATM 01	ICAO coordinator		SAM/IG/6	Completed
Fleet navigation capacity.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/9	Completed
Listing of gateways of the main TMAs in the SAM Region.	PFF SAM ATM 02	Alexandre Luiz Dutra Bastos		SAM/IG/9	Few States have provided the data requested. The SAM/IG/11 meeting agreed to support States in the design of their TMAs so as to expedite PBN implementation.
Letters of Agreement and Contingency with adjacent States.	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		SAM/IG/10	Completed
Detailed study of the SAM ATS route network, route network Version 02	PFF SAM ATM 01	Alexandre Luiz Dutra Bastos		April 2012	Completed
Risk analysis for the implementation of Version 02 of the ATSRO Programme	PFF SAM ATM 01	External consultants		SAM/IG/10	Completed
"*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		December 2014	This task is subject to the availability of Brazilian technical support and facilities in Jose dos Campos.

Prepare and conduct a course/ workshop on the design of terminal areas applying PBN		TBD		December 2013	New task to be approved
Prepare and organise a support team (ST) to support States that require direct assistance for airspace optimisation		TBD		2014	New task to be approved
Develop the terminal area optimisation planning strategy		TBD		2014	New task to be approved
Develop guides for the design, assessment, and selection of the navigation specification to be applied in TMAs where required		TBD		2014-2016	New task to be approved
Develop concept verification and validation and risk analysis procedures		TBD		2014-2016	New task to be approved
Identify implementation restrictions and develop guides for pre-implementation training		TBD		2014-2016	New task to be approved

Plan of action for Version 03 of the SAM ATS route optimisation programme		TBD		October 2015	New task to be approved
Design the necessary tasks for the implementation of Version 03 of the SAM ATS route optimisation programme		TBD		2016-2018	New task to be approved
Regional strategy and work programme for the implementation of the flexible use of airspace, applying a phased approach, starting with a more dynamic sharing of reserved airspace		TBD		2013-2018	This task is currently under Project B2 of the SAM Region, and the proposal is that it be transferred to this Project.
Resources required	Designation of experts in the execution of some of the deliverables.				

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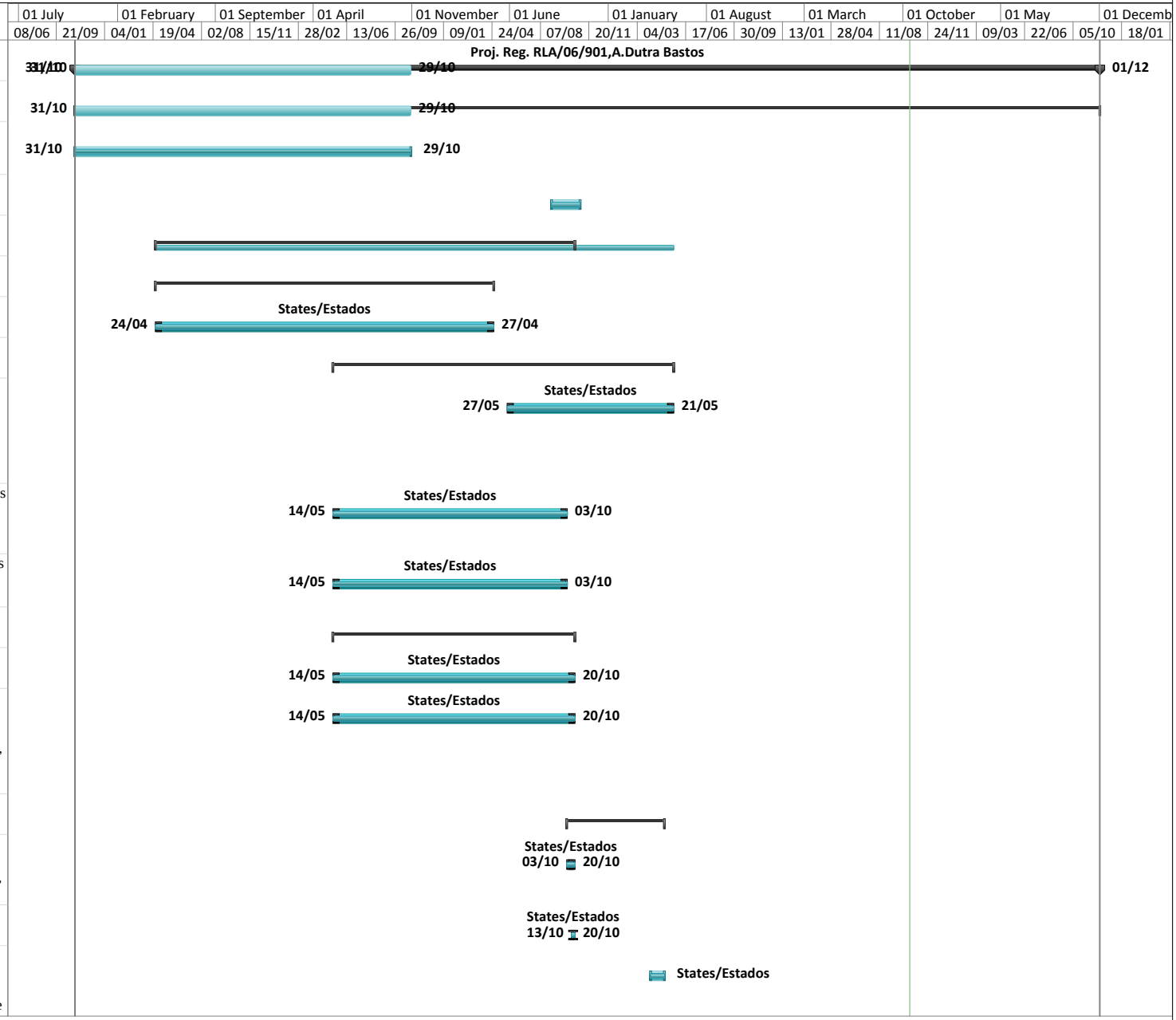
Grey	Task not started
Green	Activity underway as scheduled
Yellow	Activity started with some delay but expected to be completed on time
Red	It has not been possible to implement this activity as scheduled; mitigating measures are required

ID	Task Name
1	**Implantación operacional PBN/PBN operational implementation**
2	**Optimización de Rutas ATS/ATS Route Optimization**
3	Implantación de la versión 1 de la red de rutas ATS, basadas en RNAV/ ATS Route Optimization RNAV based Version 1
4	Análisis de Riesgo Post Implantación/Risk analisis Post Implementation
5	**RNAV-5 a corto plazo/ RNAV-5 Short term**
6	**Aprobación de aeronaves y operadores / Aircraft and operator approval**
7	Aprobación de aeronaves y operadores / Approval of aircraft and operators
8	**Normas y procedimientos**
9	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
10	Revisar el Manual de Procedimientos de las unidades ATS involucradas / Review the Procedural Handbook of the ATS units involved
11	Actualizar cartas de acuerdo entre unidades ATS/ Update the letters of agreement between ATS units
12	**Capacitación / Training**
13	Conducir programas de capacitación
14	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
15	**Decisión de implantación/ Implementation decision**
16	Evaluar la documentación operacional disponible (ATS, OPS/AIR) / Assess the available operational documentation (ATS, OPS/AIR)
17	Publicar trigger NOTAM / Publish trigger NOTAM
18	Ejecutar un programa de monitoreo post-implementación de operaciones en Ruta/ Implement a post-implementation en-route operations monitoring programme



ID	Task Name
19	**Plan de acción Versión 02 optimización de la red de rutas ATS/ ATS Route Optimization Version 2**
20	Datos de tráfico para entender los flujos de tráfico del espacio aéreo/Data traffic to understand trafffic flows
21	Analisis de rutas ATS seleccionadas de la versión 2/Selected ATS Routes Vs.2
22	Análisis de riesgo para la implantación de la Versión 2 del Programa ATSRO
23	Simulación acelerada y Modelado de espacio aéreo/Fast simulation and airspace modeling
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