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/03
24/04/13

Agenda Item 2: Optimization of SAM airspace

OPTIMIZATION OF SAM AIRSPACE

(Presented by the Secretariat)

SUMMARY

This working paper proposes an update of the Action Plan for the Optimization of SAM Routes, Phase 3, Version 2, and invites to its review and complete update, taking into account the needs of the Region. The implementation of route UM662 is proposed, and the new States participating in Project RLA/06/901 are invited to propose more routes for optimization under the ATSRO Programme.

REFERENCES

- SAM/IG/10
- ATS/RO/4

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

1 Background

1.1 The SAM/IG/10 meeting continued analysing the feasibility of the routes approved by the ATS/RO/4 meeting, providing information on RNAV/RNP gateways for the respective terminal areas.

1.2 Furthermore, airline operators flying along these routes carried out the corresponding studies of the proposed routes, taking into account flying time over the mountain range, single-engine flying time, weather and volcanic conditions, etc. which might affect them, and submitted these additional analyses.

1.3 The meeting took note of the Brazilian request to conduct the implementation in phases, based on route packages for certain flows with complex traffic volumes, taking into account that a significant traffic increase was expected in some critical areas as a result of world sport events.

1.4 The meeting recognised that it might not be possible to implement the whole route package by the expected date and that, in Brazil, it would not be possible to implement some routes until the second half of 2014.

2 **Discussion**

2.1 Taking into account that much progress is being made in the Region in route optimization, the meeting felt the need to continue in parallel with airspace optimization and extend it to terminal areas.

2.2 In this regard, ATS/RO meetings will continue to manage the Route Optimization Programme, and this and subsequent meetings will address the optimization of terminal areas with PBN procedures and continuous descent and climb operations (CDO and CCO).

2.3 It was also felt advisable for this meeting to discuss some routes that were pending, providing their coordinates and proceed with their immediate implementation. States like Ecuador and Colombia, which do not participate in Project RLA/06/901, may propose and/or approve the optimization of routes that are of interest to users between pairs of cities, and include them in the ATSRO Programme.

2.4 Amongst the routes long pending implementation is the direct route between Guayaquil and Madrid (UM662), which could not be implemented due to restricted areas along its path, and has been deferred several years.

2.5 Regarding **Route UM662**, Venezuela proposed a modification to the following path: **Guayaquil BIVAN/ILVIR/AMAYA/EGOSU/DAREK Madrid** and, if stakeholders agree, the required coordinates shall be provided for its implementation and the corresponding proposal of amendment shall be submitted. **Appendix A** contains the data on this route for updating.

2.6 Other two direct routes that have been requested by users are the **Guayaquil-Lima** and **Quito-Lima** routes, which require coordination and studies for early implementation or inclusion in the route package selected under the ATSRO Programme. See the forms to be completed in **Appendix B**.

2.7 In this regard, and in order to advance the required tasks before the ATS/RO/5 meeting, which will discuss the ATSRO Programme, it would be advisable for Ecuador, which did not attend the SAM/IG/10 meeting, to analyse and study Appendix A to Item 2 of the SAM/IG/10 meeting report, in order to submit to ATS/RO/5 its analysis of the routes under consideration which affect its FIR. This should be included in the Action Plan to facilitate its follow-up.

2.8 In view of the above, it is necessary to review and update the Action Plan for the Route Optimization Programme shown in **Appendix C** to this working paper.

3. **Suggested action:**

3.1 The meeting is invited to:

a) create an *ad-hoc* group made up by experts from the States and users to define the final coordinates of route UM662, as described in Appendix A;

b) create an *ad-hoc* group made up by experts from the States and users to define the coordinates and path of the Guayaquil- Lima and Quito-Lima routes, completing the corresponding route sheet shown in Appendix B;

c) update the Action Plan for Route Optimization **(**Appendix C**).**

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APPENDIX A / APÉNDICE A

42	GUAYAQUIL/MADRID (RUTA UM 662)	
Ruta actual /Current route (FliteStar)	**UA550**	**Notas/Notes**
Distancia actual Current distance	1369NM	Hasta limite/Up to boundary FIR Maiquetía/Piarco/
*Número de vuelos mensuales *Number of monthly flights	62	
*Tipo de aeronave más utilizada *Type of most used aircraft	B763	
Trayectoria propuesta Trajectory proposed	CARTE/ o BIVAN to DAREK Ecuador confirmará	Venezuela expresa que luego de las coordinaciones con las autoridades militares de Venezuela, no habrá inconveniente en el tramo propuesto/Venezuela states that after coordinating with its military authorities, there would be no problem with the proposed segment. Ecuador expresa su acuerdo con la propuesta/Ecuador agrees with the proposal. Colombia en reuniones anteriores expresó que no tendría inconveniente, sin embargo queda pendiente la confirmación /In previous meetings, Colombia stated that it had no problem. However, it is pending confirmation.
Distancia de trayectoria propuesta Distance of proposed trajectory	1345	
Millas reducidas Reduced miles	24	
Reducción de Combustible/ CO_2 aproximado Fuel Savings / approximate CO_2		
Estados involucrados States involved	Ecuador, Colombia, Venezuela	
Observaciones Remarks	Actualmente no hay ruta directa/Currently there is no direct route.	
*De acuerdo a información disponible/As per available information.		

APPENDIX B – APÉNDICE B

XX	GUAYAQUIL/LIMA	
Ruta actual /Current route (FliteStar)	**XXXX**	**Notas/Notes**
Distancia actual Current distance		
*Número de vuelos mensuales *Number of monthly flights		
*Tipo de aeronave más utilizada *Type of most used aircraft		
Trayectoria propuesta Trajectory proposed		
Distancia de trayectoria propuesta Distance of proposed trajectory		
Millas reducidas Reduced miles		
Reducción de Combustible/ CO_2 aproximado Fuel Savings / approximate CO_2		
Estados involucrados States involved	Ecuador, Perú	
Observaciones Remarks	Actualmente no hay ruta directa/Currently there is no direct route.	
*De acuerdo a información disponible/As per available information.		

XX	**QUITO/LIMA**	
Ruta actual /Current route (FliteStar)	**XXXX**	**Notas/Notes**
Distancia actual Current distance		
*Número de vuelos mensuales *Number of monthly flights		
*Tipo de aeronave más utilizada *Type of most used aircraft		
Trayectoria propuesta Trajectory proposed		
Distancia de trayectoria propuesta Distance of proposed trajectory		
Millas reducidas Reduced miles		
Reducción de Combustible/ CO_2 aproximado Fuel Savings / approximate CO_2		
Estados involucrados States involved	Ecuador, Perú	
Observaciones Remarks	Actualmente no hay ruta directa/Currently there is no direct route.	
*De acuerdo a información disponible/As per available information.		

APPENDIX C (revised 24/04/13)

ACTION PLAN FOR THE OPTIMIZATION OF THE ATS ROUTE NETWORK OF THE SOUTH AMERICAN REGION (GPIs 1, 5, 7, 8, 10, 11)

Activity	Start	End	Responsible party	Observations
1. **First Phase – RNAV-5 implementation - COMPLETED**				
2. **Second Phase – Implementation of Version 1 of the SAM ATS Route Network - COMPLETED**				
3. **Third Phase – Implementation of Version 2 of the SAM ATS Route Network**				
Activity	**Start**	**End**	**Responsible party**	**Observations**
3.1. **Flexible use of airspace**				
3.1.1. Establish a civil-military coordination committee to assess the application of the Flexible Use of Airspace concept cited in 3.1.1.	SAM/IG/7	SAM/IG/11	States	Civil-military committees must be implemented in those States that have not done it yet. Civil/Military Coordination Meeting/ Workshop held on 16-19 August 2011.
3.1.2. Develop route implementation and/or realignment proposals based on the application of FUA	SAM/IG/7	SAM/IG/11	States	
3.2. **Airspace concept**				
3.2.1. Collect traffic data to understand traffic flows in the upper airspace.	SAM/IG/9	30 Sep 2012	SAM/PBN/IG (Project RLA/06/901) States	The Secretariat sent a State letter: Response date: September 2012 Chile, Colombia, Paraguay and Uruguay sent traffic data on time.

				Another traffic data collection was conducted in August 2012. Bolivia, Chile, Colombia, Paraguay, Peru, Venezuela and Uruguay sent data.
3.2.2. Define the gateways of the main TMAs of the SAM Region	SAM/IG/7	SAM/IG/11	States	States that have not yet restructured the terminal area shall submit the information at the SAM/IG/11 meeting.
3.2.3. Update the Letters of Agreement and Contingency with adjacent States.		SAM/IG/12	States	
3.2.4. Conduct a detailed study of the SAM ATS route network, with a view to preparing version 2 of the route network, including: • Identification of the tools required for conducting the study mentioned in 3.2.5 (aeronautical charts, specific software) • Definition of SAM airspace structure scenarios, including ATS routes, control sectors, TMA interface, for assessment using "airspace modelling" and fast-time ATC simulation tools. • Identification of ATS routes that should be eliminated, based on their utilization; • Proposal, if necessary, of the extent of the exclusionary airspace volume where RNAV-5 is to be applied. • If necessary, identification of the "conventional" ATS routes that should be eliminated or replaced with RNAV routes, based on the possible extent of the exclusionary RNAV-5 airspace. • Identification of RNAV routes that should	SAM/IG/7	SAM/IG/9 SAM/IG/11	SAM/PBN/IG (Project RLA/06/901)	Two experts were hired for a period of 3 weeks on the second half of February 2012. The first part has been completed. The first draft was developed for review by States and operators, and support was requested from the Project to continue working on the Optimization Study, with the engagement of a second period of 3 weeks and 2 experts before March 2013, based on new traffic data collected in August 2012, the feasibility studies conducted by States, and any modified TMAs in the Region. This task has not been fulfilled due to

be re-aligned, based on possible modifications to the gateways of the main SAM TMAs. • Description of possible scenarios for version 2 of the SAM route network and control sectors based on the analysis of the aforementioned items. • Description of the interface between the SAM route network and the CAR route network. • Presentation of an initial proposal of amendment to the CAR/SAM ANP. • Based on traffic data, analysis of the possibility of implementing RNAV-5 parallel routes with adequate separation. • Development of planning criteria to be used by States and airspace users in this implementation process (see paragraph 2.13 of the ATSRO/03 report). • Development of a plan for the optimization of restricted, prohibited, danger, and reserved use areas of the SAM Region. • Application of CDO techniques				failure of States to send their data in August. SAM/IG and ATS/RO meetings have reviewed and modified the first draft, and the deadline for its definition has been set to the SAM/IG/11 meeting. The restructuring of routes, Phase 3, version 2, will be carried out by ATS/RO meetings.
3.2.5. Conduct a seminar/workshop/work meeting on airspace planning	ATSRO/3	April 2013	Project RLA/06/901	Request the support of Project RLA/06/901 and DECEA (Brazil). The Secretariat should send a letter to DECEA requesting two instructors. The purpose is to train airspace planners of the States of the Region on the 2nd half of April 2012 in Lima. This task was fulfilled with the conduction of a Course/Workshop on

				PBN design of CAR/SAM airspace and terminal areas on 11-22 March 2013, where IATA provided the instructors, Canso the translation, and Project RLA/06/901 contributed with LAN Chile and LAN Peru designers to support the experts during the workshops. Argentina, Brazil, Colombia, Paraguay, and Peru participated from the SAM Region, together with two experts from Project RLA/06/901. A total of 8 experts from the SAM Region were trained. A practical exercise related to the Lima TMA was conducted.
3.2.6. Conduct "Airspace Modelling" and fast-time simulation studies to assess the scenarios developed under 3.2.5	July 2013	SAM/IG/12	Project RLA/06/901 States	The Secretariat inquires about using the tool available in Brazil. If this is possible, procure, through Project RLA/06/901, the participation of 2 experts from the States of the Region. It has not been possible to use the tool due to availability issues.

3.2.7.	Prepare the required safety assessment, applying a qualitative methodology using the SMS	31/07/12	SAM/IG/10 SAM/IG/11	Project RLA/06/901 States	An expert needs to be hired for 2 weeks to carry out this task. (This task has been completed.) The following task is still pending: States shall conduct a safety analysis of changes in their terminal areas (TMAs).
3.2.8.	Conduct the Fifth Workshop/Meeting for the Optimization of the SAM ATS Route Network (SAM ATSRO/5), for the purpose of reviewing and validating the studies mentioned in 3.2.6 and 3.2.7.	SAM/IG/10	July 2013	Project RLA/06/901 States	This meeting will also take care of Phase 3, Version 2, of the ATSRO Programme.
3.2.9.	Conduct the Third Workshop/Seminar/Meeting for conducting the risk analysis of version 2 of the SAM ATS route network. Validation of the study described in item 3.2.7.	September 2012	SAM/IG/11	Project RLA/06/901 States	COMPLETED
3.3.	**Implementation of Version 2 of the SAM ATS Route Network**				
3.3.1.	Process the proposal of amendment to the CAR/SAM Air Navigation Plan	August 2013		SAM Regional Office	The date must be adjusted.
3.3.2.	Publish version 2 of the SAM ATS Route Network	22 August 2013		States	The date must be adjusted.
3.3.3.	Entry into effect of version 2 of the SAM ATS Route Network or a segment of the route package as per the SAM/IG/10 report, Item 2.5	17 October 2013			The date must be adjusted.