Agenda Item 3: SAM airspace optimisation
a) En-route PBN

ATS/RO/6 Meeting Report

(Presented by the Secretariat)

SUMMARY

The purpose of this working paper is to present Version 3 of the ATS Route Optimisation Programme (ATSRO) for the South American Region, as approved by the ATSRO/6 meeting, for review and comments by the Meeting.

REFERENCES:

- GANP, Version 4
- ANIP/ASBU Version 1.4
- SAM/IG meetings
- ATS/RO meetings
- SAM ATS Route Optimisation Programme

ICAO strategic objectives:	*A – Safety* *B – Air navigation capacity and efficiency* *E – Environmental protection*

1. Background

1.1 The ATS/RO/6 meeting, held in Lima on 27 to 30 October 2014, recalled that the SAM/IG/9 meeting had conducted a study to calculate savings resulting from route optimisation. The results of the study were quite encouraging, despite the fact that it only considered point-to-point paths, from terminal to terminal, without taking into account the analysis of paths within terminal areas of the States and in standard departures and arrivals, which could contribute to airspace optimisation through the use of PBN for terminal area redesign.

1.2 In order to support the implementation of Version 3 of the ATS/RO Programme, the SAM/IG/11 meeting agreed to hire 4 experts for a period of 3 weeks to conduct a detailed study and develop the SAM ATS route network optimisation.

2. **Discussion**

2.1 Consultants José Tristão Mariano, Alexandre Luiz Dutra Bastos, Fernando Hermoza Hübner, and Héctor Ibarra Martínez, under the auspices of Regional Project RLA/06/901, drafted a preliminary report for the optimisation of the SAM ATS route network, Version 3, comprising Stage 1 of Version 3, which includes proposals for route realignment and elimination, as well as the implementation of new RNAV routes, based on the current design of the main SAM TMAs. The final version (Stage 2) of Version 3 of the route network will depend on the PBN redesign of the main TMAs, the validation of which shall be submitted at the third PBN workshop.

2.2 The ATS/RO/6 meeting approved the following general and planning principles used by the consultants for the restructuring of SAM airspace:

a) Ensure network connectivity of ATS routes to/from known TMA entry/exit points that had been submitted to ICAO.

b) Convert regional conventional routes into regional RNAV routes, taking into account a future exclusionary RNAV 5 upper airspace (RNAV routes can have the same path as an already existing conventional route).

c) The most direct routes must take into account the IAF for arrivals instead of aligning them to the ARP.

d) Parallel RNAV routes must be implemented where operational benefits can be derived (*e.g.*, heavy air traffic, flow segregation for airports in the same TMA, etc.).

e) Integration with the domestic route networks.

f) Eliminate or reduce points of congestion wherever possible.

g) Maintain the number of ATS routes to a minimum, always taking into account traffic demand in relation to ATC capacity and the possibility of applying direct routes.

h) Maintain the least possible number of crossings, and should crossings are required, they should be planned so as to avoid sectors with higher congestion.

i) Avoid redundant ATS routes.

j) Take into consideration those routes that had been planned in previous implementation stages of Version 2, and which were not implemented for various reasons.

k) For Stage 1, restricted airspaces were not considered to be of flexible use given the absence of data from the States.

2.3 The meeting took note that the AVIANCA-TACA and LATAM groups had indicated that the work done by the experts had been thorough, precise, and very easy to analyse, and acknowledged the Regional Office for the opportunity of making the corresponding comments by means of the aforementioned paper. The meeting also agreed to analyse other routes submitted by LATAM with the purpose of taking into consideration other airport pairs. These routes were incorporated into the proposed ATS/RO Version 3.

2.4 The ATS/RO/6 meeting recalled that the criterion applied in the Region was that domestic routes or route segments with less than thirty (30) movements per month were eliminated. In this regard, the meeting felt that these should be analysed on a case-by-case basis for both domestic and regional routes in the airspace around the Andes mountain range, taking into account that, sometimes, flight conditions are extremely adverse and justify the existence of published alternatives to avoid certain areas at certain periods of time.

2.5 Regarding the above, it was felt that there could be routes that are used very few times in the course of one year, but meteorological conditions when crossing the Andes mountain range are such that it is convenient to have alternatives to avoid turbulent and bad weather areas, as well as volcanic activity.

2.6 Upon reviewing the preliminary report for the optimisation of the SAM ATS route network, Version 3, the ATS/RO/6 meeting noted that there could be an opportunity for better integration between State plans and SAM route optimisation, or for conducting separate analyses of the main traffic flows in the main homogeneous areas of the Region.

2.7 During the ATS/RO/6 meeting, the Secretariat reminded State experts and user representatives that, within the framework of the PBN Programme, the ideal thing would be to know in advance the entry and exit points of each terminal area to ensure full PBN connectivity of Version 3 of the route network. However, that is not possible in a first stage, because many States are still in the phase of planning and designing their new TMAs and others had not completed the validation phase.

2.8 Furthermore, in this regard, the Secretariat noted that full implementation of Version 3 was inconceivable for both ATS systems and operators, taking into account the operational impact that such a large implementation could have.

2.9 Following a thorough analysis, the meeting felt that, in order to implement the SAM ATS route network optimisation plan, Version 3, it had to be done in stages. Accordingly, it selected a route block for Stage 1, based on proposals made by consultants, States and users. Through Conclusion ATSRO/6-1, the meeting approved the implementation of Stage 1 of Version 3 of the SAM ATSRO Plan, on a date to be agreed between the States involved and the SAM Regional Office via teleconferencing. Version 3 of the selected ATSRO programme is shown in **Appendix A** to this working paper.

2.10 The meeting accepted the proposal of the Secretariat to include some associated activities in GREPECAS Project A1 within the context of PBN for airspace optimisation. These activities are described in **Appendix B** to this working paper.

3. **Suggested action:**

3.1 The Meeting is invited to review the work done within the framework of the ATS/RO/6 meeting and, if deemed advisable, to:

a) endorse the implementation methodology adopted, and Stage 1 of ASTRO Version 3, as shown in Appendix A;

b) propose the changes and/or adjustments it deems appropriate for better airspace integration;

c) review the activities described in Appendix B for their inclusion in GREPECAS Project A1 within the context of PBN for airspace optimisation; and

d) propose other Project activities that it may deem necessary for the implementation.

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APPENDIX A

SAM ATS ROUTE NETWORK OPTIMIZATION PLAN

VERSION 03 – STAGE 1

APPENDIX B

Activities to be considered for inclusion in GREPECAS Project A1 - PBN

- Provision of information on number of flights and types of aircraft flying the route, in order to calculate fuel savings;

- Inform the Secretariat of special areas or airspaces that have been optimised within the framework of the FUA concept (calculation of miles or square kilometres, and number of optimised levels);

- Updating of the database and maps of automated systems;

- Updating of the database of AMHS systems;

- Definition of the coordinates of crossings with other routes, assignment of 5-letter designators, and validation in the ICARD system by the Regional Office;

- Coordination via teleconferencing with the Secretariat and the States, of the coordinates of points in adjacent FIRs that contain each route, and ICARD processing validated by the Regional Office;

- Development by the Secretariat of the amendment process, for approval by Headquarters;

- Approval of the amendment consultation cycle by States;

- Definition of the date of issuance and effective date of the corresponding AIRAC two periods following the approval of the Amendment;

- Updating of the letters of agreement and contingency plans, as needed.

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