



**Agenda Item 1: Review of the ICAO South American Region ATS Routes Network Optimisation Programme**

**ATSRO ACTION PLAN**

(Presented by the Secretariat)

<b>SUMMARY</b>	
This working paper presents a review of the ATS Routes Network Optimisation Programme. The programme is aimed at the restructuring of the routes network, the extensive implementation of RNAV-5 navigation specification, as well as enhancing the implementation of RNP2.	
<b>References:</b>	
<ul style="list-style-type: none"><li>• ATS/RO meetings reports</li><li>• SAM/IG meetings reports</li><li>• SAM PBN CONOPS period 2018-2020</li></ul>	
<b>ICAO strategic objectives:</b>	<i>A - Safety</i> <i>D - Economic development of air transport</i> <i>E - Environmental protection</i>

**1 Background**

1.1 The objective of the Bogota Declaration signed in December 2013, includes specific goals concerning PBN implementation. In this sense, the goals of the aforementioned Declaration are aimed at the establishment of a more efficient RNAV routes network, with more direct and better aligned flight paths, as well as the adequate connection to procedures and standardized departure/arrival routes in the TMAs.

1.2 During ATSRO/6 meeting (27-30 October 2014), Stage 1 of Version 03 of the SAM Region Route Optimisation Programme was presented. Same was evaluated and completed by participating experts in order to prepare the corresponding implementation plan, taking into consideration aircraft PBN capacity. Stage 1 completed its implementation through Proposal for Amendment (PfA) SAM 15/01-ATM to the SAM Air Navigation Plan, Doc 8733, approved in February 2015.

1.3 Aiming to continue with the routes network optimisation process, ATSRO/7 meeting (12-16 October 2015) assessed the implementation of Stage 2 of Version 03 of the SAM Route Network. In this sense, Version 03 - Stage 2 routes implementation dates were agreed for AIRAC cycles of July and

October 2016. This set of routes was included in Table ATM II-CARSAM-1-CAR/SAM ATS Routes, Section IV, Volume II of eANP, as published under following link:

[https://www.icao.int/NACC/Pages/ES/namcar-eANPV1\\_ES.aspx](https://www.icao.int/NACC/Pages/ES/namcar-eANPV1_ES.aspx)

1.4 At the same time, ATSRO/7 meeting reviewed the South American Airspace Optimisation Action Plan which included, in addition to routes optimisation, the PBN implementation in TMA, the routes network optimisation, the application of RNP2 and the progressive reduction of longitudinal separation in FIR boundaries.

1.5 Said Plan was presented and approved in SAM/IG/16 meeting, carried out the following week of ATSRO/7 with five activities being agreed for 2016, consisting of two PBN implementation workshops, one PANS-OPS workshop, the preparation of Version 04 of routes network and the realization of the present ATSRO meeting.

1.6 SAM/IG/18 meeting (17-21 October 2016) was informed that the Tenth Meeting of the Coordination Committee of Project RLA/06/901 (RCC/10) approved the hiring of two experts with a view to develop Version 04 of the SAM Routes Network, which resulted in 91 proposals involving realignment and routes deletion, as well as the implementation of new RNAV routes. The deliverable of this activity was concluded by 23 June 2017.

## 2 Analysis

2.1 Having completed the three PBN/PANS-OPS workshops scheduled for 2016 and counting with Version 04 of Routes Network prepared during the first half of 2017, it can be observed that the South American airspace optimization Action Plan was partially fulfilled.

2.2 Likewise, in view of the time elapsed between ATSRO/7 and the current meeting, it is deemed adequate to formulate and approve an ATSRO Action Plan updating the pending activities' sequence and including aspects of the new PNB Concept of Operations for the SAM Region Airspace (CONOPS), with metrics and indicators establishing the elements to be considered in the PBN regional implementation.

2.3 Complementarily, it is proposed that the Secretariat, considering the new planning elements available, integrates the ATSRO Action Plan into the updating of the South American Airspace Optimisation Plan, to be presented to SAM/IG/20 meeting in October 2017, for discussion and approval.

2.4 In this regard, **Appendix A** to this working paper brings the **ATSRO Action Plan** to the consideration of the Meeting, which should be reviewed to meet current requirements and if applicable, include other short and medium-term activities.

## 3 Suggested action:

3.1 The Meeting is invited to:

- a) Take note of the information presented in this working paper; and
- b) Evaluate and propose improvements to the ATSRO Action Plan presented under Appendix A.

## APPENDIX A

## ATSRO ACTION PLAN

Activity	Start	End	Responsible	Remarks
<b>1. SAM Route Network</b>				
<b>1.1. Version 04 of Route Network – RNAV-5</b>				
<p>1.1.1. Perform detailed study of the SAM ATS Route Network, with a view to developing Version 04 of the Route Network (TMA - Arrival/Departure/RNAV-5 route segment interface), including:</p> <ul style="list-style-type: none"> <li>• Prepare work plan for the participation of hired/loaned experts and experts from States/International Organizations who would support the preparation of the preliminary draft.</li> <li>• Determine tools required to conduct the study (aeronautical charts, specific software).</li> <li>• Analyse traffic data to understand traffic flows.</li> <li>• Analyse fleet navigation capacity.</li> <li>• Prepare the preliminary draft of Version 04 of the SAM Route Network, including control sectors, TMA interface, etc.</li> <li>• Assess the feasibility/need to assess the preliminary design using “<i>airspace modelling</i>” tools and fast-time ATC simulation.</li> <li>• Propose the initial draft of the Proposal of Amendment to the CAR/SAM ANP.</li> <li>• Prepare the Plan for the Optimisation of Restricted, Prohibited, Danger and Reserved Use Zones of the SAM Region.</li> </ul>	SAM/IG/18 (October 2016)	June 2017	SAM/PBN/IG (Project RLA/06/901) States IATA IFALPA ATM RO	<ul style="list-style-type: none"> <li>• Hiring/“loaning” of 2 experts for 3 weeks in order to prepare a preliminary draft.</li> </ul> <p>NOTE: PBN implementation in SAM TMAs progressed during 2016 and 2017. Examples: Argentina (Baires in process), Brazil, Colombia and Paraguay.</p>

Activity	Start	End	Responsible	Remarks
<ul style="list-style-type: none"> <li>• Calculate fuel/CO<sub>2</sub> savings using IFSET to validate the preliminary design of the SAM airspace structure, covering routes/SIDs/STARs.</li> <li>• Prepare “SAM Route Network, Version 04” document.</li> <li>• Prepare working paper for the ATSRO/8 meeting.</li> </ul>				
<p>1.1.2. Hold the Eighth Workshop/Meeting on SAM ATS Routes Optimisation, with the purpose of reviewing Version 04 of the Route Network.</p> <p>Includes:</p> <ul style="list-style-type: none"> <li>• Review draft Version 04 of the ATS Route Network. Define implementation process.</li> </ul>	SAM/IG/18 (October 2016)	ATSRO/8 (September 2017)	Project RLA/06/901 States ATM RO	
<p>1.1.3. Joint work with States for them to perform the risk analysis on the SAM Region Route Network, Version 04.</p>	ATSRO/8 (September 2017)	ATSRO/9 (July 2018)	Project RLA/06/901 States ATM RO	<ul style="list-style-type: none"> <li>• Will be done through teleconferences and distribution of documents as guideline, if required.</li> </ul>
<p>1.1.4. Analysis and incorporation in SAM implementation activities, of route optimisation initiatives originated in the CAR Region and coordinated with NACC Office.</p>	NACC III PBN Meeting (September 2017)	ATSRO/9 (July 2018)	Project RLA/06/901 States ATM RO	<ul style="list-style-type: none"> <li>• Will be done through teleconferences. Coordination during SAM/IG/21 meeting (May 2018) will be considered.</li> </ul>

Activity	Start	End	Responsible	Remarks
1.1.5. Conduct the Ninth Workshop/Meeting on SAM ATS Routes Network Optimisation, with the purpose of monitoring the implementation of Version 04 of the Route Network and adjusting the programme of publication and entry into force. Initiatives coordinated with NACC Office will be included.	ATSRO/8 (September 2017)	ATSRO/9 (July 2018)	Project RLA/06/901 States ATM RO	
1.1.6. NAM-CAR-SAM inter-regional coordination to define implementation of exclusive RNAV-5 airspace above FL245.	TBD	TBD	SAM Regional Office NACC Regional Office	
<b>1.2. Version 05 of Route Network</b> <ul style="list-style-type: none"> <li>○ <b>RNAV-5 Regional and Inter-regional upper airspace</b></li> <li>○ <b>RNAV-5 for airspace below FL245</b></li> <li>○ <b>RNP2 for Continental and Oceanic airspaces</b></li> </ul>				
1.2.1. Perform study to develop Version 05 of Route Network, considering implementation of RNAV-5 and RNP2 navigation specification in selected airspaces. It includes: <ul style="list-style-type: none"> <li>• Prepare work plan on the participation of hired/loaned experts and experts from the States/International Organizations who would support the preparation of the preliminary draft.</li> <li>• Define the tools required to conduct the study (aeronautical charts, specific software).</li> <li>• Analyse traffic data. Study of regional and inter-regional upper airspace routes network; optimization and replacement of conventional routes.</li> </ul>	ATSRO/8 (September 2017)	SAMIG/22 (2018)	Project RLA/06/901	2 experts will be hired for 3 weeks.  Tentative date: September 2018

Activity	Start	End	Responsible	Remarks
<ul style="list-style-type: none"> <li>• Analyse TMA or involved aerodromes interfaces. Select airspaces for RNAV5 application in regional route.</li> <li>• Analyse traffic data for airspace involving regional routes below FL245. Analyse fleet navigation capacity, in detail on the general aviation fleet.</li> <li>• Analyse traffic data for RNP2 oceanic airspace. Analyse fleet navigation capacity.</li> <li>• Prepare the Plan for Optimisation of Restricted, Prohibited, Danger and Reserved Use Zones of the SAM Region.</li> <li>• Calculate fuel/CO<sub>2</sub> savings using IFSET to validate the preliminary design of the SAM airspace structure, covering routes/SIDs/STARs.</li> <li>• Develop deliverable “Version 05 of SAM Route Network”, including harmonized implementation plan.</li> <li>• Prepare working paper for SAM/IG/23.</li> </ul>				
1.2.2. Review preliminary deliverable of Version 05 of Route Network. Analyse and propose changes to harmonized implementation plan, as required.	SAM/IG/23 (2019)	SAM/IG/23 (2019)	Project RLA/06/901 States ATM RO	
<p>1.2.3. Hold the Tenth Workshop/Meeting on SAM ATS Routes Network Optimisation, to review Version 05 of the Route Network. It includes:</p> <ul style="list-style-type: none"> <li>• Review draft Version 05 of the ATS Routes Network. Define process according to harmonized implementation plan for RNP2 and selected airspaces below FL245, respectively.</li> </ul>	SAM/IG/23 (2019)	ATSRO/10 (2019)	Project RLA/06/901 States ATM RO	

<b>Activity</b>	<b>Start</b>	<b>End</b>	<b>Responsible</b>	<b>Remarks</b>
1.2.4. Perform risk analysis of Version 05 of the SAM ATS Routes Network, coordinating such activities with involved States.	ATSRO/10 (2019)	TBD	Project RLA/06/901 States ATM RO	1 expert will be hired for 2 weeks.
1.2.5. Hold the Eleventh Workshop/Meeting on SAM ATS Routes Network Optimisation, with the purpose of monitoring implementation of Version 05 of Routes Network and adjusting the programme of publication and entry into force.	TBD	TBD	Project RLA/06/901 States ATM RO	

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