



Agenda Item 2: Analysis of Version 1 of the SAM ATS routes network

**IDENTIFICATION OF GATEWAYS OF THE MAIN TMAs
IN THE SOUTH AMERICAN REGION**

(Presented by the Secretariat)

Summary <p>This working paper presents information concerning task 3.2.3 of the action plan of the ATS route network optimisation programme, particularly some aspects to be taken into account by airspace planners for the identification of the gateways of the main TMAs in the South American Region, with a view to their appropriate integration into the ATS route network. It also contains some guidelines for the restructuring of terminal areas, if so required.</p>	
References: <ul style="list-style-type: none">• Annex 11 to the ICAO Convention• Doc 9426, Air Traffic Services Planning Manual• Doc 9931, Continuous Descent Operations Manual• Cir. 330, Civil-Military Cooperation in Air Traffic Management• SAM/IG meeting reports• ATS route network optimisation programme and its associated action plan	
ICAO Strategic Objectives:	<i>A – Safety</i> <i>C – Environmental protection and sustainable development of air transport</i>

1 Background

1.1 As everybody knows, there is a requirement to establish an area of airspace in the vicinity of certain aerodromes to provide an adequate level of safety to air operations. Usually, this airspace is established for the provision of air traffic control services to aircraft operating under IFR and, where necessary, to aircraft operating under VFR. This airspace is known as the terminal area (TMA), and together with ATS routes, standard departure and arrival procedures and approach procedures for a specific airport, makes up a unit that is unique in the airspace structure.

1.2 A growing concern is the fact that ATS route planners and terminal area planners develop their own structures independently, and, in some cases, when trying to design the optimum structure that integrates a route network with arrival and departure operations, airspace restrictions may be generated that prevent an orderly, flexible and safe flow to and from airports. Therefore, this independent

development must be discouraged, encouraging cooperation among the various stakeholders in order to have a continuous and seamless airspace as envisaged in the ICAO global air navigation plan and the ATM operational concept.

1.3 Likewise, in many cases, when speaking of terminal area *design*, the tendency is to associate it to the design or construction of approach procedures as established in the PANS/OPS, when the latter actually supplements the design of the terminal area, which has a broader meaning, and refers to the design of the terminal airspace concept, with its routes, holding patterns, airspace structure and sectors, all integrated into the ATS route network. Therefore, this design precedes and has a direct impact on instrument procedure design phases.

2 Discussion

2.1 As established in the ATS route network optimisation programme, the initial planning phase for the implementation of a new route network must consider the integration of the RNAV route network and TMA arrival and departure paths, taking into account the need to reduce pilot and air traffic controller workload, mainly through a more effective use of flight management systems (FMS) and reduced ground/air/ground communications.

2.2 In order to achieve this appropriate airspace, the gateways of the main TMAs of the SAM Region need to be defined from the beginning.

2.3 For planning and implementing airspace improvements, particularly in the TMAs, States shall develop their own airspace concepts, which will enable the definition of gateways for the main TMAs of the SAM Region.

2.4 In Version 1 of the route network, it was only possible to include TMA gateways for those States that had already begun the process of improving the airspace structure.

2.5 The action plan for the implementation of Phase 3 of the optimisation programme establishes, in paragraph 3.2.3, that States shall define the gateways of the main TMAs of the SAM Region. This task is to be completed between the SAM/IG/7 meeting (May 2011) and the SAM/IG/9 meeting, which is scheduled for May 2012.

2.6 The challenge that airspace planners will then face, taking into account the expected air traffic growth, will be, *inter alia*, to:

- a) meet ATS requirement of ensuring that capacity is maintained at least at current levels and that delays due to terminal airspace restrictions are minimised;
- b) meet safety requirements;
- c) meet environmental protection requirements;
- d) meet the various demands and requirements of airspace users, taking into account the new and diverse development plans of users.

2.7 Accordingly, planners should avoid the tendency to create an area of airspace that is “independent” from the route network and, when designing their TMAs, in conjunction with PANS/OPS procedure designers, should consider ATC operational requirements, with due consideration to environmental protection and the associated costs and benefits.

2.8 In order to determine the gateways of the main TMAs of the SAM Region, States will probably have to conduct a more extensive analysis and maybe also restructure such airspaces, in which case it might be necessary to take into account the following non-exhaustive list of principles:

- a) The process should take into account the systematic application of the FUA and the progress made in PBN implementation in TMAs and approaches.
- b) Safety must be improved or at least maintained at current levels, in compliance with ICAO SARPs on this matter, and based on the corresponding risk analysis.
- c) The design must respond to operational requirements, balancing the interests of the ATC, airspace users, and the environment, promoting the flexible use of airspace.
- d) Airspace design must be based on the collaborative decision-making concept (see the CDM Manual for the SAM Region); therefore, a multidisciplinary team of specialists representing all stakeholders should participate in the TMA redesign project.
- e) Terminal airspace should be designed as an integral part of airspace, both from the lateral and vertical point of view, in order to ensure a continuous flow of operations.
- f) Continuous descent techniques should be used in order to maximise operational efficiency, taking into account airspace requirements and restrictions, and establishing optimised arrivals to the extent possible (Doc 9931).

3. **Suggested action**

3.1 The Meeting is invited to take note of the information provided in this working paper, and States are requested to:

- a) start, if they have not done it yet, the implementation of tasks related to paragraph 3.2.3 of the action plan of Phase 3 of the ATS route network optimisation programme, which requires the establishment of gateways for the main TMAs for their inclusion in Version 2 of the ATS route network;
- b) require their airspace planners, when conducting their activities, to take into account paragraphs 2.6 to 2.8 of this working paper; and
- c) report to the SAM/IG/8 meeting on the progress made, and to the SAM/IG/9 meeting on the work completed.

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