

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**CAR/SAM REGIONAL PLAN FOR THE
IMPLEMENTATION OF THE
CNS/ATM SYSTEMS**

**DOCUMENT II - CNS/ATM ACTION PLAN
FOR THE CAR/SAM REGIONS**

September 1999

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Chapter 1: Introduction

Objective

1.1.1 The Action Plan is a complementary document to the *CAR/SAM Regional CNS/ATM Implementation Plan* and its purpose is to establish the detailed evolution of air traffic management requirements, both en-route and in terminal areas, and the services that will have to be established in order to meet these requirements in each of the two regions.

1.2 Planning considerations

1.2.1 CNS/ATM Planning in the CAR/SAM Regions has been worked out in two documents, the first of which is the “*CAR/SAM Regional CNS/ATM Implementation Plan*”, which contains a description of the CNS/ATM concept to be applied in these two regions. It is a high-level document developed on the basis of the Global Air Navigation Plan for the CNS/ATM Systems, which was used in its original form by the States to prepare their national CNS/ATM plans. The second document complements the first and is known as the *Action Plan*.

1.2.2 The two documents are closely interrelated with the new CAR/SAM Air Navigation Plan format. As a result, Document I will orient the future formulation of the basic operational requirements and planning criteria (BORPC) for the CAR/SAM ANP, while Document II will provide the necessary guidelines for planning the required support facilities and services from the facilities and services implementation document (FASID) of the ANP CAR/SAM, for regional implementation of the CNS/ATM systems.

1.2.3 The Action Plan has been developed on the basis of the requirements established in the air traffic management defined for the Caribbean and South America Regions. The CAR/SAM ATM has been defined under the concept of Homogeneous Areas, into which the main inter- and intra-regional traffic flows are grouped in an effort to institute the idea of transparent FIRs. As a result, the harmonisation, not only within the CAR/SAM Regions, but also with the ICAO regions where important traffic flows are identified, should be based on this document.

1.2.4 As they develop, the operational ATM concept and the related concepts of required communication performance (RCP), required navigation performance (RNP), required surveillance performance (RSP), and required total system performance (RTSP) should be made a part of the planning process so that the latter can continue to move ahead. Planning and implementation, therefore, should be viewed as an on-going development and maturing process.

1.2.5 As a result, GREPECAS and, through it, the CNS/ATM/IC Subgroup, are responsible for integrating and harmonising the plans for the CNS/ATM systems in the CAR/SAM Regions. The ICAO, for its part, through the World Plan, the ALLPIRG meetings, world conferences and an inter-regional co-ordination mechanism, will carry out the inter-regional co-ordination in order to ensure the world-wide compatibility, harmonisation, and continuity of the systems.

1.3 **Scope of the Action Plan**

1.3.1 This document, which has been developed by GREPECAS, covers the airspaces of the Caribbean, Central America and South America (CAR/SAM) Regions. The air traffic management evolution tables indicate the FIRs or regions with which the plan must be harmonised in the case of inter-regional flows.

1.3.2 The planning horizon considered is up to the year 2010, in accordance with the following time scale:

Short-term	1998-2000
Medium-term	2001-2005
Long-term	2006-2010

1.3.3 The States of both regions will be able, on the basis of this document, to revise their national plans for the purpose of bringing them into line with regional requirements. Likewise, and as a concrete implementation strategy is to be established, it will be the basic document for inter-regional harmonisation.

1.4 **General principles to bear in mind**

1.4.1 All States in the CAR/SAM Regions should be guaranteed without restriction the possibility of access to the provision of the air navigation services covered in this document.

1.4.2 There is an acknowledged need for the States in the CAR/SAM Regions to complete their national plans, as well as the provisions that govern the use of the new systems.

1.4.3 The States must accept the global nature of the new CNS/ATM systems and the determined intention of facilitating the integration mechanisms for their timely implementation.

1.4.4 The communication, navigation and surveillance services must be carefully planned in keeping with the requirements identified for an appropriate level of air traffic management in the CAR/SAM Regions.

1.4.5 The new CNS elements must be introduced progressively, bearing in mind the benefits they will yield for ATM and the savings for both the users and providers of the systems.

Chapter 2: Implementation Strategy

2.1 Regional Implementation Concept

2.1.1 The Regional Implementation Concept defined by GREPECAS is keyed to ATM improvement for the CAR/SAM Regions and the communication, navigation and surveillance requirements this generates. The ATM improvements have been defined on the basis of the major international traffic flows identified in the homogenous areas.

2.1.2 The most important air traffic flows in the CAR/SAM Regions cover both regions and many of them extend to the borders of the CAR/SAM Regions with the AFI, EUR, NAM, NAT and PAC Regions. Table 2-1 details the main traffic flows identified in the homogeneous areas and the **Appendix** to this chapter contain charts showing the homogeneous areas and the main traffic flows.

2.1.3 It should be noted that the main traffic flows that cross more than one homogeneous area are cited only in the homogeneous area corresponding to the direction of the flow, that is, North/South or East/West.

-1- Homogeneous Area (AH)	-2- Traffic Flows	-3- FIR Involved	-4- Type of Area	-5- Remarks
Caribbean/South American Regions (CAR/SAM)				
AH 1	Buenos Aires-Santiago de Chile	Ezeiza, Mendoza, Santiago	Low density Continental	SAM intra-regional traffic flow
	Buenos Aires-Sao Paulo/Rio de Janeiro	Ezeiza, Montevideo, Curitiba, Brasilia	Low density Continental	SAM intra-regional traffic flow
	Santiago de Chile-Sao Paulo/Rio de Janeiro	Santiago, Mendoza, Cordoba, Resistencia, Asuncion, Curitiba, Brasilia	Low density Continental	SAM intra-regional traffic flow
	Sao Paulo/Rio de Janeiro-Europe	Brasilia, Recife	Continental / Low density Oceanic	SAM/AFI/EUR inter-regional traffic flow
AH 2	Sao Paulo/Rio de Janeiro-Miami	Brasilia, Manaus, Maiquetia, Curacao, Kingston, Santo Domingo, Port au Prince, Habana, Miami	Continental / Low density Oceanic	CAR/SAM/NAM inter- and intra-regional traffic flow
	Sao Paulo/Rio de Janeiro-New York	Brasilia, Belem, Paramaribo, Georgetown, Piarco, Rochambeau, San Juan (New York)	Continental / Low density Oceanic	CAR/SAM/NAM/NAT inter- and intra-regional traffic flow

-1- Homogeneous Area (AH)	-2- Traffic Flows	-3- FIR Involved	-4- Type of Area	-5- Remarks
AH 3	Sao Paulo/Rio de Janeiro-Lima	Brasilia, Curitiba, La Paz, Lima	Low density Continental	SAM intra-regional traffic flow
	Sao Paulo/Rio de Janeiro-Los Angeles	Brasilia, Porto Velho, Bogota, Barranquilla, Panama, Central America, Merida, Mexico, Mazatlan (Los Angeles)	Low density Continental	CAR/SAM/NAM inter- and intra-regional traffic flow
	Mexico - North America	Mexico, Monterrey, Houston, Miami	Continental / Low density Oceanic	CAR/NAM inter-regional traffic flow
AH 4	Santiago - Lima - Miami	Santiago, Antofagasta, Lima, Guayaquil, Bogota, Barranquilla, Panama, Kingston, Habana, Miami.	Continental / Low density Oceanic	CAR/SAM/NAM inter- and intra-regional traffic flow
	Buenos Aires - New York	Ezeiza, Resistencia, Asuncion, La Paz, Porto Velho, Manaus, Maiquetia, Curacao, Santo Domingo, Miami (New York)	Continental / Low density oceanic	CAR/SAM/NAM/NAT inter- and intra-regional traffic flow
	Buenos Aires - Miami	Ezeiza, Resistencia, Cordoba, La Paz, Porto Velho, Bogota, Barranquilla, Kingston, Habana, Miami	Continental / Low density Oceanic	CAR/SAM/NAM intra- and inter-regional traffic flow
AH 5	North of South America - Europe	Guayaquil, Bogota, Maiquetia, Piarco (NAT-EUR)	Continental / Low density Oceanic	SAM/NAT/EUR inter-regional traffic flow
AH 6	Mexico - Europa	Mexico, Merida, Habana, Miami (NAT-EUR)	Continental / Low density Oceanic	CAR/NAM/NAT/EUR inter-regional traffic flow
	Central America - Europe	Central America, Panama, Kingston, Port Au Prince, Curacao, Santo Domingo, San Juan (EUR)	Low density Oceanic	CAR/NAT/EUR intra- and inter-regional traffic flow
AH 7	Santiago - Lima - Los Angeles	Santiago, Antofagasta, Lima, Guayaquil, Central America, Merida, Mexico, Mazatlan	Low density Oceanic	CAR/SAM/NAM intra- and inter-regional traffic flow
AH 8	South America - South Africa	Ezeiza, Montevideo, Brasilia, Johannesburg (AFI)	Low density Oceanic	SAM/AFI inter-regional traffic flow
	Santiago de Chile - Ester Island - Papeete (PAC)	Santiago, Easter, Tahiti	Low density Oceanic	SAM/PAC inter-regional traffic flow

Table 2-1. Homogeneous Areas and Min Traffic Flows Identified in the CAR/SAM Regions

2.1.3 The evolution of the ATM and the CNS requirements associated with that evolution have been defined for each of the traffic flows identified in the table above. In each case, the implementation dates and the necessary co-ordination to make it effective have been indicated.

2.1.4 The transition to the CNS/ATM systems will be accomplished gradually on the basis of ATM improvements - first those that can be achieved using the conventional system and then those that are needed as the CNS/ATM systems are implemented. As a result, from the time standpoint, the transition for each of the flows defined in Table 2-1 will be independent, but without losing sight at any time of the necessary co-ordination for the implementation of the other flows.

2.1.5 The ATM improvements are the key to the transition. Chapter 3 of this Action Plan defines the evolution of those improvements for en-route operations for each of the main traffic flows and for operations in terminal areas. In the case of TMAs, a handbook will be delivered that will permit each State to examine the status of its terminal areas with respect to airspace management (ASM), air traffic services (ATS), and air traffic flow management (ATFM). The expected ATM evolution is also shown in terms of the operational requirements for each TMA.

2.2 Human Resources and Training

2.2.1 The provision and satisfactory functioning of air navigation, as well as the appropriate application of the ICAO SARPs, highly depend on the optimum qualification and training of the technical and operational personnel involved, as well as of their availability in enough number to attend the various aviation services.

2.2.2 Being aware of the above and considering that further training will be required as consequence of the implementation of the CNS/ATM systems, GREPECAS, through the Human Resources and Training Task Force established by the CNS/ATM/IC Subgroup, has elaborated a CNS/ATM Training Guide Manual, to serve as a guideline to States with respect to training aspects associated with CNS/ATM implementation.

2.2.3 In addition, GREPECAS has taken into account other efforts being carried out by ICAO to standardize training objectives through the TRAINAIR Programme, and is promoting the development of efforts related with the training and dissemination of the CNS/ATM systems.

2.2.4 For their part, the Civil Aviation Training Centres (CATCs) in both Regions have paid particular attention to the current technological evolution and implementation of the CNS/ATM systems, since, once their planning and implementation is carried out, it will be necessary to disseminate the CNS/ATM systems concept at all levels and, later, an increasing demand for personnel qualified in a wide range of emerging disciplines and technologies will have to be met. The future task of designing and implementing appropriate CNS/ATM systems training, which utilize high automation levels, will present additional challenges to civil aviation training.

2.2.5 Due to the above, the CATCs have initiated a study to quantify, as possible, the human resources which will be necessary to maintain the current air navigation systems and start with the implementation and functioning of the new CNS/ATM systems. From this analysis, the number of duly qualified personnel with which the CATCs must count with to face the increasing personnel demand will arise and, also, an early identification will be achieved of those disciplines which will change and the new professions which will emerge.

2.2.6 In order to ensure that all personnel participating in the planning, implementation, management and maintenance fully comprehend the concepts and technologies of the various elements composing the CNS/ATM systems, the CATCs, in coordination with the Human Resources and Training Task Force, have started to elaborate introductory courses in areas such as: Required Navigation Performance (RNP), Global Navigation Satellite System (GNSS), Automatic Dependent Surveillance (ADS), World Geodetic System - 1984 (WGS-84), Reduced Vertical Separation Minima (RVSM), data links, etc. These training programmes will be later distributed to all the Civil Aviation Training Centres in the CAR/SAM Regions, avoiding effort duplication.

2.3 **Air Traffic Forecast**

2.3.1 During the period between 1960 and 1995, world-wide passenger traffic (domestic and international) measured in terms of passenger-kilometer, has increased at an annual average growth rate of 8.9%, while in terms of air cargo, measured in tons-kilometers, flows have increased at an annual average growth rate of 11.1%.

2.3.2 Future air transport growth will fundamentally depend on economical growth and on trade exchange, as well as on the evolution of airlines' operations costs, which, in turn, greatly depend on the behaviour of fuel costs. Nevertheless, it is also subject to the degree in which the industry faces problems related to airport and airspace congestion, as well as to environment protection and the increasing need of capital investment.

2.3.3 It is foreseen that until 2005, world-wide regular air traffic shall increase at a "probable" annual average growth rate of 5.5%, while air cargo traffic would grow at an annual average growth rate of 7%. With regard to the CAR/SAM Region, an annual average growth rate of 4.5% is expected in terms of passengers, and 6.5% in air cargo.

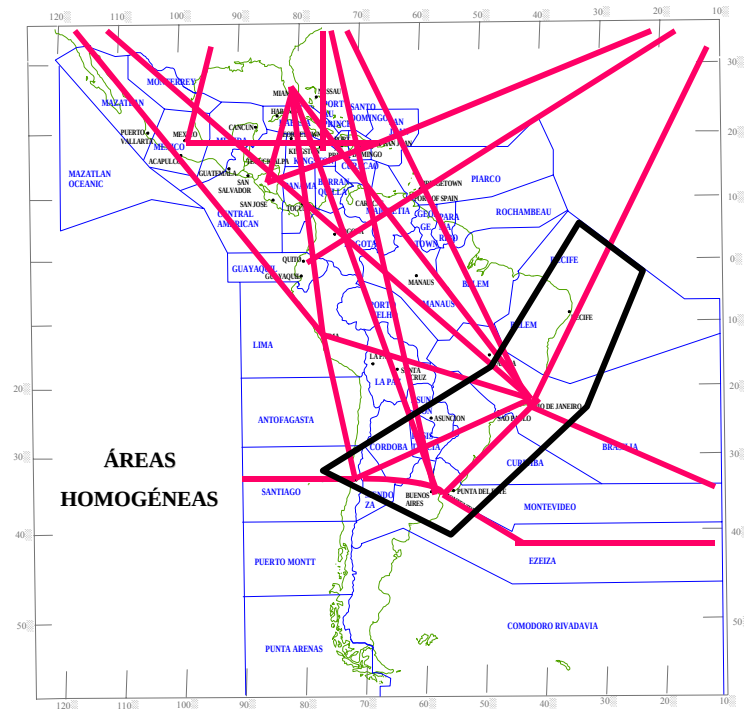
2.3.4 When available, to this part of the Action Plan air traffic forecast information from the Air Traffic Forecasting Task Force, created by GREPECAS with this objective in mind, and by IATA, will be added.

2.4 **Cost-Benefit Analysis**

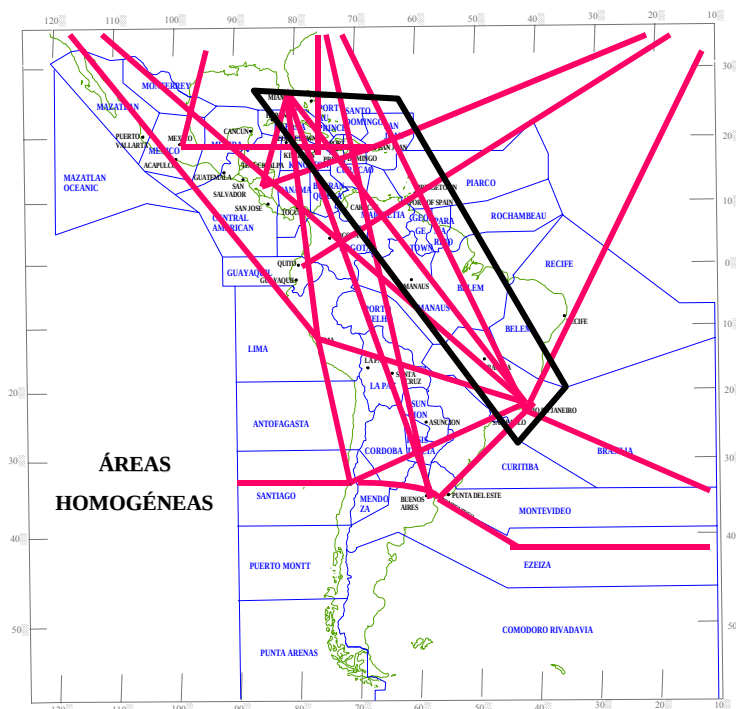
This subject will be completed when the information is available.

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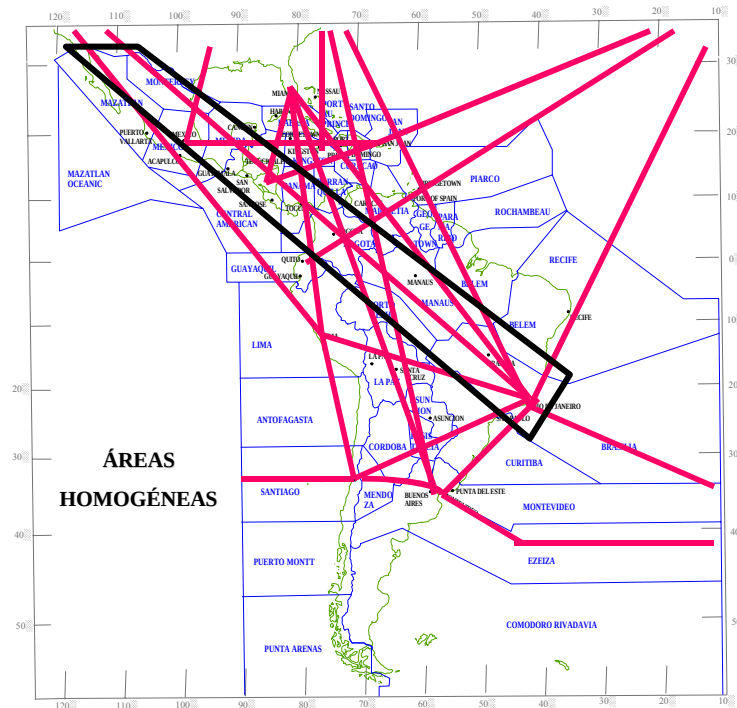
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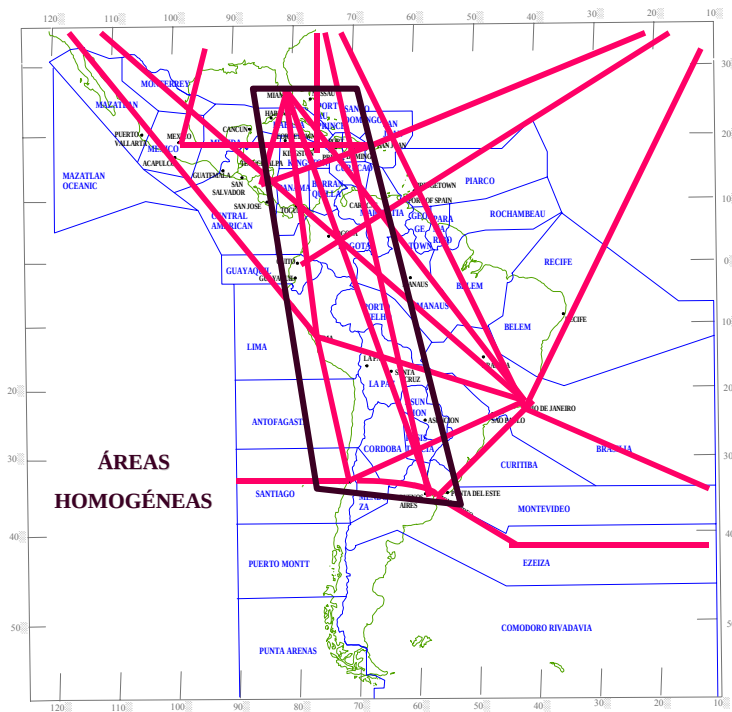
AH 1



AH 2

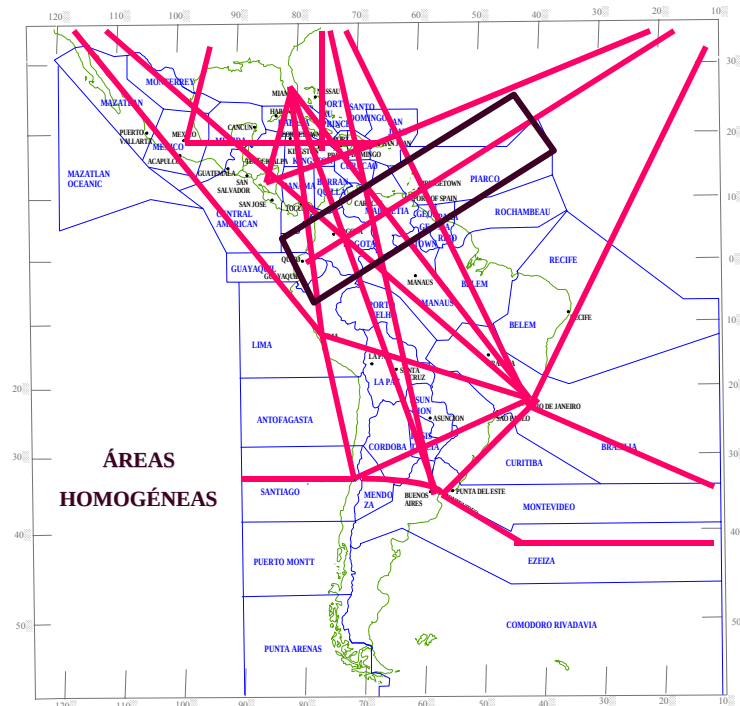


AH 3

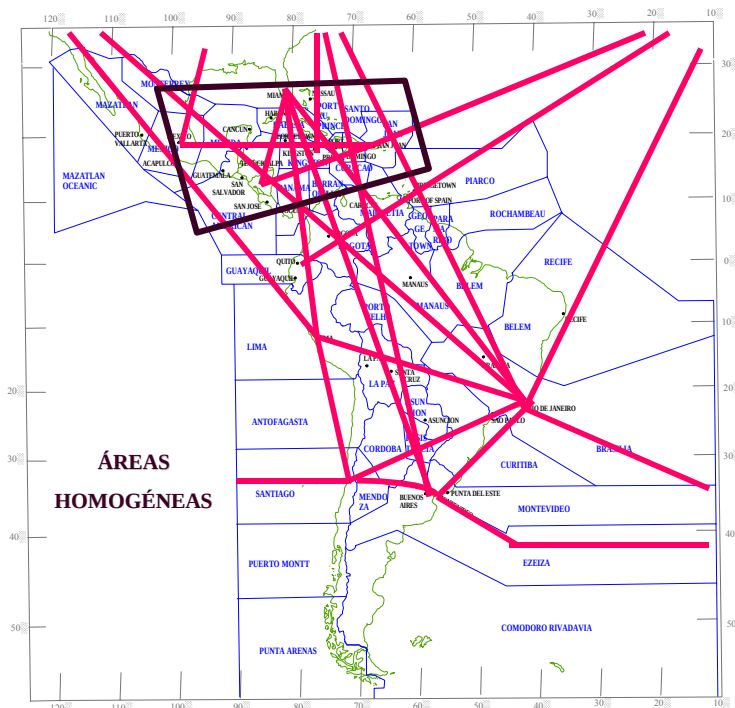


AH 4

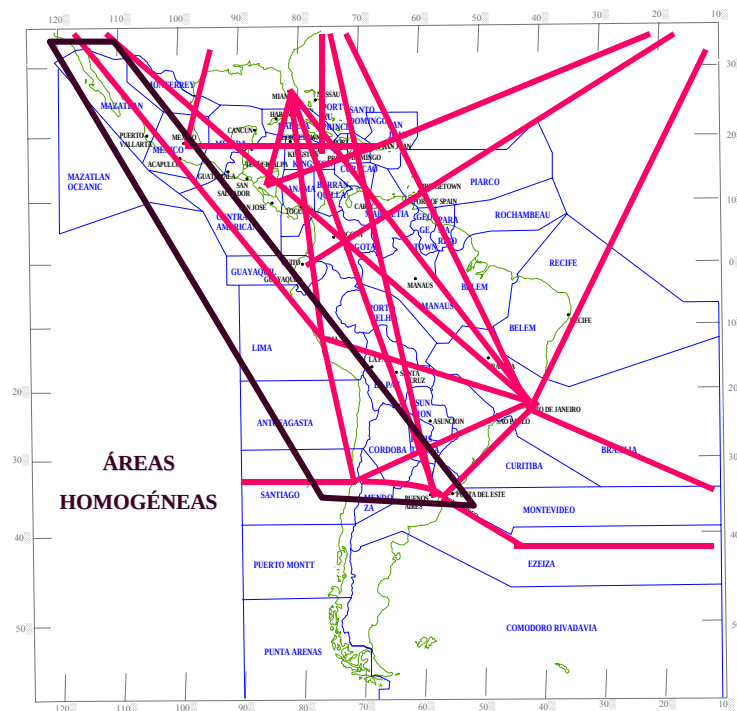
Plan de Acción CNS/ATM para las Regiones CAR/SAM
CNS/ATM Action Plan for the CAR/SAM Regions



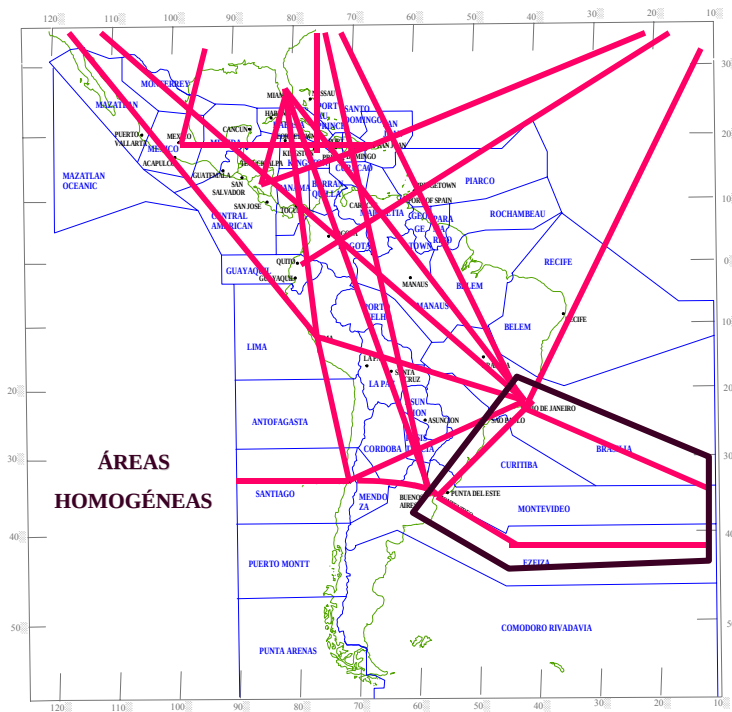
AH 5



AH 6



AH 7



AH 8

Chapter 3: Air Traffic Management

3.1 Introduction

3.1.1 This chapter complements chapter 4 of the CAR/SAM Regional CNS/ATM Implementation Plan. It contains the tables of progressive ATM evolution in each of the main traffic flows and should be continuously reviewed by GREPECAS inasmuch as with more precise traffic forecasts, the implementation dates of some of the ATM improvements may change.

3.2 Evolution of Air Traffic Management in the CAR/SAM Regions B En-route Operations

Note: The tables on ATM evolution in the CAR/SAM Regions - enroute operations - are found in **Attachment A**.

3.2.1 General considerations

3.2.1.1 The evolution of air traffic management in the CAR/SAM Regions for en-route operations and the transition from conventional systems to CNS/ATM systems has been carefully planned in order to avoid any impairment in the performance of the present system. It is necessary to assure throughout the transition at least the present level of operational safety, with the progressive attainment of improvements in air navigation efficiency. Consideration has also been given to not burdening aircraft unnecessarily with the need to carry multiple CNS equipment, both the existing and the new ones, during the long transition phase.

3.2.1.2 For reasons of both economy and efficiency, it is necessary to ensure that the differences in rate of development and implementation of the new air navigation systems at the level of the CAR/SAM Regions do not result in an incompatibility of the elements of the system in general. It would not be advisable for some States/Territories to make improvements in the CNS/ATM systems on their own, for these must be made in co-ordination with neighbouring administrations. It is essential to have international harmonisation and, in the final instance, integration into a continuous and homogenous system, in order for operations across international borders to be compatible and for users to be unable to perceive differences in the services supplied.

3.2.1.3 The planned ATM system consists of several sub-systems: Air Traffic Management (ASM), Air Traffic Services (ATS) and Air Traffic Flow Management (ATFM). These sub-systems will evolve harmoniously as part of an integral system. The ATM aspects of the flight operations will be fully integrated as a functional part of the existing system. This inter-operation and functional integration of the system will result in a synergy of operations that does not exist at present. The ATM evolution planned for en-route operations will use as its starting point the elements that are currently available, in order to attain complete functional integration with the air and land parts of the system. The operational implementation of any CNS or ATM element or improvement should take into account the existence of the SARPs and other relevant ICAO documents.

3.2.2 Human factors

3.2.2.1 While the ATM Evolution Tables shown at the end of this chapter for en-route and terminal area operations do not mention the human factor, the understanding is that the planning and implementation of ATM functions is closely tied-in with the special consideration of the human element not only because of its relationship with the level of safety sought-after for the future system, but also as a result of the planned degree of automation and the increase in airspace capacity due to its maximum use combined with the management of large volumes of information in a high-technology environment.

3.2.2.2 Aspects such as intended level of safety of the future system and the responsibility of the pilots, air traffic controllers, and designers of the system should be defined in relation to the mechanisms that lead to error with regard to limitations in human capacity. This definition should be clearly established before implementing the new automated systems and equipment (i.e., conflict resolution alerts, data links, ADS, etc.).

3.2.2.3 The evolution of the ATM will include, in addition to the analysis and evaluation of specific matters for consideration, systematic evaluations of the more general effects with relation to the human factor before and after its implementation. These evaluations should cover the effect on the volume of work and the production of flight crew members and ATS personnel. Special care should be taken with regard to the effects of the CNS/ATM systems on the selection, instruction and human/professional development of ATS personnel specifically.

3.2.3 Operational concept

3.2.3.1 The evolution of en-route ATM, together with ATM evolution in terminal areas, will move toward the most important objective of an integrated ATM system, which is to allow aircraft operating agencies to comply with their planned arrival and departure schedules and follow their preferred optimum flight profiles with a minimum of limitations, without having the result affect the level of operational safety.

3.2.3.2 The operational concept described should help and guide airspace planners in the design of the airspace and of its systems in order to make all phases of aircraft operations safe and effective at all stages of flight and within the concept of gate-to-gate operations being currently developed. Planners should consider that not everything that is desirable is necessary and that therefore a balance must be reached between the stated service improvement needs and the cost of their implementation.

3.2.3.3 While the initial changes represent a specific proposal for improving ATM, based on progressive development using elements of the existing technology, it should be mentioned that the immediate benefits in terms of ATM improvements call for determined and specific measures and actions to achieve the correct and satisfactory operation of the present air navigation infrastructure, including existing CNS and ATM elements. Subsequent proposals are an expression of the direction in which ATM should develop for en-route operations and should reflect the expected order of events that could occur. The planning is adjusted to permit the earliest possible achievement of ATM benefits from the implementation of CNS system elements.

3.2.4 Composition of the ATM Evolution Tables - En-route operations

ATS tracks/routes

3.2.4.1 Whenever feasible or viable, and with a view to facilitating airspace design, the planning should be based more on a concept of area control than on a network of fixed ATS routes. Even so, the implementation of a network of fixed RNAV routes has been planned for the CAR/SAM Regions, taking advantage of aircraft air navigation capacity. This network of fixed RNAV routes will be one of the main economic benefits of the CNS/ATM system because of the possible and gradual withdrawal of the present ground-based navigation system.

3.2.4.2 While in the beginning this RNAV capacity may continue to be provided by on-board systems of ground-based navigation radio aids and by autonomous systems like the INS/IRS, there will be a growing trend toward the use of global navigation satellite systems (GNSS). The expectation is that more-and-more random RNAV routes will be introduced, making airspace use more flexible and economic.

3.2.4.3 The implementation of RNAV Routes, together with the approval of the required navigation performance (RNP) will substantially improve navigation precision in both regions and allow for more rational airspace use, with the resulting benefits for the users. The network of RNAV routes will be implemented progressively, with priority being given to differ segments in accordance with the users requirements.

3.2.4.4 The following step will be the application of the autonomous flight, whereby pilots will be able to direct their flights without need for any specific route, speed or altitude authorisations. While this is an emerging concept still being developed by ICAO, autonomous flight has been planned as part of the ATM evolution for the CAR/SAM Regions and will provide the necessary flexibility and capacity in the future, allowing for optimum (dynamic) flight paths for all airspace users through the application of communication, navigation, and surveillance technologies and the establishment of air traffic management procedures that will make airspace use even more flexible, while ensuring positive aircraft separation.

Longitudinal separation between aircraft in ATS tracks/routes

3.2.4.5 The first step in ATM evolution with a view toward increasing airspace capacity may be taken with the application of already-known procedures covered in relevant ICAO documents. A uniform 10-minute longitudinal separation at the level of both regions will make it possible to use the airspace more efficiently and will, in the first instance, relieve the congestion that is occurring at the preferential flight levels on given routes at peak traffic hours.

3.2.4.6 Reduced longitudinal separations based on distances will begin to be applied as operational requirements justify them, through the approval and publication on ground and the certification of aircraft at the different values of required navigation performance (RNP) accuracy. Maintenance of an air operations safety level equal to or better than the present one is a prerequisite for the implementation of any reduction in the separation minimums. It should also be borne in mind that the relevant SARPs must first be published before any separation criterion may be applied.

Spacing between ATS tracks/routes

3.2.4.7 The spacing between ATS tracks/routes at the level of the CAR/SAM Regions will depend upon the traffic flow involved and the airspace where this flow develops. The 100 NM spacing will continue to be used in low density oceanic areas, while reduced spacing between lower ATS tracks/routes will begin to be employed through the application of RNP values in oceanic or continental areas that have, or are expected to have, a heavier traffic density, thereby guaranteeing lateral navigation precision. The changes have been planned on the basis of an evaluation of the needs of each particular traffic flow and the respective traffic forecasts must be prepared in order to adjust the planning more precisely.

3.2.4.8 In radar environments and in particular circumstances, the spacing between ATS track/route centre lines may be reduced to 8 NM values, although an evaluation must be made of the safety of the system, including the controller=s workload.

Reduced vertical separation minimum (RVSM)

3.2.4.9 Because of the different characteristics of the airspaces and of the typical aircraft fleets, together with the varying regional needs for more airspace capacity, the reduced vertical separation minimum of 1000 feet above FL 290 will be implemented subregionally or in given main traffic flows. After a period of application in selected flows, and in accordance with the operational and homologation requirements of the fleets, it will be possible to set a common future date for its regional application. Application of the reduced vertical separation minimum above FL 290 will increase airspace capacity substantially.

Airspace Management (ASM)

3.2.4.10 Conceptually speaking, airspace management assumes that the airspace will be shared dynamically by civil and military users. In an integral ATM system, airspace management will not be limited to the tactical use of airspace alone, but will extend to its strategic planning and flexible use.

3.2.4.11 All users should have access to the necessary airspace, based more on a concept of flexible use than on a strictly segregation-based ATM system. Furthermore, the needs of all users should be respected without obstructing flexible and dynamic airspace use. The CNS/ATM systems will support this function through the exchange of data and real time supervision of the airspace status. In order to be accomplished this effectively and in addition to fulfilling the technical requirements, it is essential for the States to have their civil/military co-ordination perfectly structured at both the planning and operational levels.

Air Traffic Flow Management (ATFM)

3.2.4.12 While in general terms there is no air traffic congestion in the CAR/SAM Regions today that would require complex flow management, certain airspace sectors have been identified where mainly during special periods and at specific times there is some congestion that should be avoided. These “bottlenecks” are due basically to the large and different longitudinal separations that are applied on the FIR borders and shortcomings in airport infrastructure.

3.2.4.13 The aim of early implementation of ATFM is to ensure optimum air traffic flow to or through areas during times when demand exceeds or is expected to exceed the available capacity of the ATC system. As a result, an ATFM system should reduce delays of aircraft, both in flight and on the ground, and avoid overburdening the system.

3.2.4.14 The ATFM system will help ATC to fulfil its objectives and bring about more effective use of available airspace and airport capacity. The ATFM should also ensure that the safety of air operations is not compromised in the event of unacceptable levels of traffic congestion and, at the same time, should guarantee that the traffic is effectively managed without unnecessary restrictions on flow.

3.2.4.15 The ATFM could be initially implemented through manual procedures. In the future, large data bases will describe the existing and foreseen levels of demand and capacity. Refined models will be used that are able to predict exactly the congestion and the delay, so that effective strategies may be worked out in real time to handle the surplus demand. Users will intercommunicate with the in-flight planning of the flow management process in order to negotiate the paths that best satisfy their needs while confronting the limitations in ATM capacity.

3.2.4.16 The negotiation processes will constitute a dialogue between the pilot and the air traffic controller to the extent necessary to enable them to exercise their management and control responsibilities. To sum up, ATS and ATFM will be amalgamated in a single continuous regional and world-wide system. The ATFM is expected to be implemented first at the level of the CAR/SAM States/Territories, then between CAR/SAM States/Territories (intra-regional), and finally between States/Territories of the CAR/SAM Regions and States of other Regions (inter-regional).

3.3 **Evolution of Air Traffic Management in the CAR/SAM Regions B Operations in Terminal Areas**

Note: the table on ATM evolution in the CAR/SAM Regions - Operations in terminal areas (TMA) - are found in **Appendix C**.

3.3.1 **General Considerations**

3.3.1.1 The evolution of air traffic management in terminal areas will complement ATM evolution for en-route operations and will allow national planners to achieve a harmonious and integrated ATM system.

3.3.1.2 In preparing the Evolution Tables for Terminal Areas in the CAR/SAM Regions, the TMAs have not been classified as high- or low-density traffic areas for the planning of CNS/ATM implementation, inasmuch as there is no parameter of yet for a high- or low-density TMA. It was also considered that many elements should be taken into account in planning the requirements for CNS/ATM infrastructure in a TMA. Other factors in addition to traffic volume must be considered, among them: aerodrome number and locations, traffic characteristics, topography, meteorological conditions, etc. Therefore, it should be up to the States/Territories to analyse each TMA in particular and to determine, in co-ordination with the users, the requirements as to the implementation of CNS/ATM elements.

3.3.1.3 In light of the foregoing, the dates cited in the Table of ATM Evolution in the CAR/SAM Regions B Operations in Terminal Areas (TMA), would serve as a frame of reference. The implementation dates of each of the elements/functions of the evolution would then be determined by the States/Territories for each TMA, in light of the operational requirements and of the corresponding technological and economic aspects. In any case, care should be taken to ensure before implementing new technical elements (CNS) or new procedures (ATM), that they are already covered in the SARPs or other pertinent ICAO documentation.

3.3.2 Composition of the Table on ATM Evolution in the CAR/SAM Regions B Operations in Terminal Areas

Optimised Sectorisation

3.3.2.1 In order to achieve a gradual evolution of ATM, it is first necessary to review the airspace management in order to identify the aerodromes that are operating at full or almost full capacity and to establish maximum levels of acceptance based on the configuration, navigation aids, weather conditions typical of the aerodrome, and the controllers= work loads.

3.3.2.2 To develop an optimum airspace configuration, sectorisation should be optimised so that it is transparent to the users and balanced in terms of the work load involved. This, combined with the effective use of appropriate automated techniques, will make it possible to increase the capacity of the air traffic control system, which will result in direct benefits in terms of safe and efficient air operations.

Implementation of SIDs and STARs

3.3.2.3 The implementation of conventional standard instrument departures and arrivals (SIDs and STARs) in terminal areas where they have not yet been put into effect and the adoption of standard RNAV arrivals and departures (RNAV SIDs and STARs), together with the application of RNP value , will facilitate and make aircraft circulation within the TMAs with a high degree of navigational precision as effective as possible. SID/STAR implementation should take into account the users= characteristics, as well as factors connected with safety (obstacles) and paths that are as direct as possible for the transition to/from the en-route phase.

Spacing of route/track centre lines

3.3.2.4 Reduced application of en-route/track spacing in non-radar environments will enhance airspace capacity. In radar environments spacings of up to 8 NM may be applied between the centre lines of routes/tracks, on condition that the safety of the pertinent surveillance system is evaluated, including the controller=s work load and the approval and certification of aircraft for RNP values of 4 or better.

Flexible airspace use

3.3.2.5 For efficient airspace use, it is also essential to consider the operational requirements of civil and military users and to reduce to an absolute minimum any restrictions on civil aviation operations. Flexible airspace with optimum configuration also calls for avoidance of permanent segregation created by establishing permanent Restricted Areas, for example. In any case, if that segregation proves unavoidable, the extension, configuration and periods of use of segregated airspace should be limited to the minimum necessary to safeguard the operations or activities involved.

3.3.2.6 If the segregated airspace is permanent, special arrangements should be made, according to the circumstances, to allow for the access of civil users. Close civil/military co-ordination in real time, at both the planning and operational levels, is necessary to attain that flexibility and dynamic management of the airspace. It will also be necessary to pay special attention to communication requirements between the ATS units and military units involved.

Horizontal separation

3.3.2.7 The evolution and improvement of air traffic services in TMA provides for a progressive reduction of horizontal (lateral and longitudinal) separations through the use of radar surveillance in the short/medium-term. Radar implementation in terminal areas should be preceded by a specific study to determine precisely what the operational requirements are and their relationship to the cost of implementing and operating the system.

3.3.2.8 In the planning for CAR/SAM Regions, the intention is to continue using the primary radar in association with the secondary monopulse radar (PSR/SSR) in the medium term and replacing it with the secondary radar in Mode S. Use of Automatic Dependent Surveillance (ADS/ADS-B) will gradually spread in terminal areas as a possible complement to the SSR. In the future, when the corresponding SARPs are developed, it will be used alone in those TMAs where it is required for operations.

Non precision approaches (RNAV) using basic GNSS equipment

3.3.2.9 The evolution of approximation procedures envisages the use of basic GNSS receivers to progressively replace conventional radio aids. Initially, the GNSS will be considered a supplementary system for **non precision** approaches, with the preparation of RNAV/GNSS procedures to be overlay on conventional radio aid-based procedures. This kind of overlay approaches on a non precision conventional approach offers users operational advantages by allowing them and the administrations to gain valuable experience in the use of GNSS equipment, in-flight preparation and inspection of procedures, application of the WGS 84, etc.

3.3.2.10 The following phase would be the application of RNAV/GNSS procedures to replace conventional ones in keeping with the evolution of GNSS use at the regional level. Amendment 10 to the PANS-OPS, Doc. 8168, Vol. III, applicable starting on November 5, 1998, contains the criteria for the preparation of non-precision RNAV procedures using basic GNSS receivers and GNSS equipment requirements.

3.3.2.11 The term **Basic GNSS Receiver** was developed to describe the first-generation GNSS receivers that comply at least with the RTCA DO 208, SC-181 and JAA TGL 3 and equivalent IFR certification standards such as the TSO-C129, for example. These documents specify the minimum performance requirements for GNSS receivers so that they are able to fulfil the en-route, TMA and non-precision approach procedures developed specifically for the GNSS.

3.3.2.12 According to those specified standards, GNSS receivers should incorporate at least the following capacities:

- a) Routines for integrity monitors B RAIM, for example;
- b) Turn anticipation; and
- 1) Electronic recovery of the approach procedure using a navigation database.

GNSS precision approaches

3.3.2.13 The ILS is intended to continue in the foreseeable future to be the primary system for precision approaches for the CAR/SAM Regions. As the necessary augmentations for the GNSS are implemented—Beither aircraft- or ground-based augmentations (ABAS, GBAS, SBAS) that will make it possible to meet requirements for system accuracy, availability, integrity and continuity—and considering the operational requirements and the availability of the corresponding SARPs, CAT I, II and III precision approaches will continue to be implemented.

3.3.2.14 The mentioned approaches will also make it possible to make curved and segmented approaches, thus eliminating some of the restrictions imposed by centre line-calculation approach procedures. Consideration should be given to their application at airports that are not too distant, on parallel runways not too far apart, noise trail requirements, ground/obstacle clearance requirements or the availability of little land for the construction of new runways. They would also allow for IFR independent approaches to runways only 2,500 ft. apart, thereby increasing airport capacity for operations in IMC conditions.

Note: *The criteria for construction of GNSS-based precision approach procedures are not yet available.*

Minimum Safe Altitude Warning (MSAW)

3.3.2.15 The software for minimum safe altitude warning (MSAW), a surveillance system that makes it possible to detect when an aircraft is flying below the minimum flight altitude established for a given airspace sector, is being incorporated insofar as possible into the existing radar systems and its use will become increasingly widespread as the latest generation radar systems planned for the CAR/SAM Regions are implemented.

Conflict prediction, alert and resolution advice

3.3.2.16 The software for conflict prediction, alert, and resolution advice is also being incorporated, insofar as possible, into the existing radar systems and its use is expected to become increasingly generalised as the systems planned for the CAR/SAM Regions are implemented. This system will help with the tactical control by watching over aircraft movement to check whether they are complying with the flight plans and to identify and resolve any problems, such as imminent violations of separations and incursions into airspace reserved for special use.

ATIS radio broadcasts (ATIS-VOICE/D-ATIS)

3.3.2.17 The automatic terminal information service (ATIS-VOICE) will continue to be implemented, according to operational requirements, in aerodromes where the volume of communication on VHF air-ground channels must be reduced. Likewise, and as data links at the TMA level become available, the D-ATIS will also be implemented.

Pre-departure clearance (PDC) and taxi clearance

3.3.2.18 Data link use for transmission of pre-departure clearance (PDC) and taxi clearance should be implemented at an early stage in order to reduce the communication load and errors or confusion stemming from voice communication. In light of its relationship to the TMA/Aerodrome traffic volume, its implementation should be preceded by an analysis of the pertinent aspects, with the participation of the users.

Arrivals Metering, sequencing and spacing

3.3.2.19 Better regulation, sequential organisation, and spacing of the arrival traffic using automatic metering devices would increase runway capacity in IMC to a level approaching the existing runway capacity in visual meteorological conditions (VMC). These timing, order, and separation aids should be introduced at airports where there are frequent delays for aircraft arriving in all weather conditions.

Functional integration of ground-based with airborne systems

3.3.2.20 The functional integration of ground-based with airborne systems should be planned carefully. This integration is necessary to guarantee safe and effective aircraft movement during all stages of TMA operations. The system=s airborne and ground-based requirements should be functionally capable of intercommunicating mutually in order to attain general ATM objectives. Functional compatibility of the data interchanged between the airborne and ground-based elements is essential to guarantee the system=s effectiveness.

Enhanced ground surveillance and guidance, runway incursion alert

3.3.2.21 As more aerodrome capacity is needed and/or traffic or local density conditions justify it, the use of enhanced ground surveillance and guidance, runway incursion alert will be planned. The Advanced Surface Movement Guidance and Control System (A-SMGCS) will be used for the routing, guidance, supervision, and control of aircraft and vehicles on the ground at aerodromes. This system will make it possible to maintain acceptable movement rates in all kinds of meteorological conditions, while at the same time improving the required level of air operations safety. The operational requirements of the A-SMGCS have been defined and are set out in the attachment to ICAO communication SP 20M-98/47.

Windshear detection

3.3.2.22 Windshear detection systems will be implemented gradually in keeping with operational requirements and cost-benefit justifications. As data links come into use, information about wind shear and other meteorological data will be transmitted directly and automatically to the cockpits.

Integration of FMUs

3.3.2.23 Although the future ATM system should be designed to allow normally for a maximum traffic demand in TMA, possible enlargements should be considered to respond to the future growth envisaged. The fact must be accepted that perhaps it will not be possible to handle excessive maximum traffic levels, and that therefore a co-ordinated air traffic flow management (ATFM) subsystem should be available. When there is more than one flow management unit (FMU), plans will have to be prepared to harmonise procedures and methods with the adjacent FMUs. This integration of FMUs will require appropriate communication to help co-ordinate flights that cross the areas of responsibility of more than one FMU, as well as to accede to the database that will contain information such as reserved airspace, aeronautical information, and data about airports, traffic, meteorology, and search and rescue, etc.

Chapter 4: Communications, Navigation and Surveillance

4.1 Introduction

4.1.1 Operational ATM requirements were identified for 18 main traffic flows crossing several Homogeneous Areas and several FIRs in the CAR/SAM Regions and outside of them. The progressive application of RNAV navigation and the evolutionary application of several types of RNP to these main flows, lead to the identification of operational applications such as ADS, CPDLC, AIDC as an ICC application to support the ATM evolution within the planning period.

4.1.2 Taking into account the applications mentioned above, it was intended to establish firstly the C and S elements. The navigation element (N), was considered as a RNP requirement, which can be met by different navigation systems i.e. ground based, current satellite based systems with the necessary augmentations and aircraft self-contained navigation systems. However and considering the trend towards the wider use of GNSS, its implementation was emphasized, starting from the currently available satellite navigation systems, GPS and GLONASS.

4.2 CNS Plan for Enroute Operations

Note: The CNS implementation tables for enroute operations by flight information regions are in **Attachment B**.

4.2.1 It is expected that voice communications will be maintained during the planning period for ground-to-ground and air-to-ground communications. To meet in the future these requirements in a more efficient manner will depend on the upgrading of the AFS using modern digital communications. The application of modern technology will allow the improvement of the VHF coverage.

4.2.2 It is expected that the HF voice communications will continue playing an important role in the remote and oceanic areas, until cost-effective studies may show the feasibility for an implementation of voice and data communications for the AMSS using the current satellite systems or other non-geostationary new-generation satellite systems (NGSS) such as LEOs or MEOs, which are being shown as good future candidates to provide data and voice satellite communications for civil aviation with a coverage including the polar areas. These NGSS could have several advantages in relation to the current systems, such as lower costs for avionics and communications services. In this regard, the AMCP/5 Meeting has recommended to the ICAO Air Navigation Commission the development of SARPs and of acceptability criteria for the NGSS specific application to the AMSS.

4.2.3 In relation with the data communication, the en-route CNS plans contemplate only systems compatible with the ATN internetwork as defined by ICAO within the architecture of the OSI model of the ISO. The ATN internet will be implemented in the CAR/SAM Regions in an evolutionary manner, with a view to providing maximum functionality and flexibility for the interoperation of the data links required for ATM automation. However, implementations of data communication, using the current available systems such as ACARS and the application of protocol ARINC 622, which originated avionics packages such as FANS-1/A, are possible for some environment if cost-effective studies justify the implementation of these systems as an interim requirement. These kinds of solutions are not considered in the CNS plans due to the fact that same should be considered as part of the currently available communications systems; when necessary, they should be interfaced with the ATN-compliant systems meeting the existing and future ICAO SARPs developed or being developed for the CNS systems.

4.2.4 The case indicated above should be considered in the same way as the AFTN, which is considered as a current system with respect to the ATN. The AFTN interface with the ATN, was already identified as a necessary step as part of the evolutionary development of the ATN. As it can be noted, in the CNS en-route plans the AFTN is not considered as part of them in the similar way that the existing voice communications systems were not considered.

4.2.5 The en-route plans have been developed for each FIR. When a FIR is crossed by more than one traffic flow, the most stringent requirements are considered for this FIR. As a way of example, if a FIR is crossed by two main traffic flows and one of them requires ADS by the year 2008 and the other by the year 2006, the requirement for the year 2006 will be the prevailing one for the FIR in question. This criteria to establish the operational ATM requirements, harmonizes those requirements for all the main flows crossing the FIRs and allows a coordinated implementation of the CNS requirements by the States.

4.2.6 The CNS implementation tables contain two main parts, which are explained below:

- a) the first part contains common data affecting the implementation of CNS elements to all FIRs. This data is related with the development of CNS SARPs by ICAO and aircraft equipage. In this regard and in relation with the GNSS, detailed data concerning the different aspects of the SARPs required by the system is presented.
- b) The second part contains the CNS en-route plans for every FIR considered in the CAR/SAM Regions. In order to encourage and facilitate inter-regional harmonization, in this part there are also developed plans for FIRs located in other ICAO Regions, adjacent to the CAR/SAM Regions.

4.2.7 In relation with the CNS plans for each FIR, the following should be noted:

- a) The need of implementing the ATN is identified when an ATM requirement for a data link to meet an air-to-ground or/and ground-to-ground application is required in certain period of the main traffic flows ATM evolution.

- 2) It is considered that, for an effective pre-operational test of the data links, the ATN infrastructure should be in place one year before the operational use of such a data link for specific ATM applications. Likewise the trials and demonstrations of specific ATM applications using data links should be carried out as pre-operational tests during two years before the operational use of those applications by the ATM units. These provisions would ensure that the technology would be well understood by the States and the training of personnel in the operational and technical areas could be completely achieved.
- 3) VDL Modes and other technical details affecting the rest of data links technologies have not been identified in this Annex because this part should be developed in the extent possible as part of the corresponding FASID document. Since no Mode S SSR surveillance was identified as an ATM requirement, the Mode S data link for en-route applications was not considered, for the time being.
- 4) AMSS and HF data links have been considered for oceanic and remote continental areas where no VHF communications would not be feasible to implement. As indicated before, technologies applicable to the AMSS should be later examined in the light of the NGSS as potential SATCOM providers for civil aviation.

4.3 CNS Plan for Operations in Terminal Areas

4.3.1 Introduction

Note: The CNS implementation tables for operations in terminal areas are in **Appendix D**.

4.3.1.1 The plans for the CNS element to support the ATM evolution in the Terminal Areas (TMAs) are developed based on the operational requirements on Communications, Navigation and Surveillance. In this regard, the following should be noted:

4.3.1.2 The conventional CNS systems are not considered in the CNS evolution Tables. This consideration was made due to the fact that the same should be maintained operational during the transition period and would be deactivated once the new CNS systems prove to meet current and future operational requirements to enhance the flexibility and capacity of the ATM.

4.3.1.3 In the places where it is indicated that the implementation date of the ATM requirements should be determined (TBD), considerations for the date to establish the corresponding CNS elements were not made. The CAR/SAM States should evaluate these cases and determine when these requirements could be needed in order to establish the corresponding CNS Plans for them.

4.3.2 **Communications**

4.3.2.1 In the Communications element are considered data links technologies to exchange messages or other data for several applications in the ATS, Surveillance and Navigation. In this regard it should be noted that, within the considered time frame (1994 - 2010), the only clear possibilities are the communications services to support ATM functions, such as Pre-Departure Clearance and D-ATIS.

4.3.2.2 The SARPs for the corresponding data links have already been developed. In this regard, VHF Mode 2 appears to be the most feasible candidate to initiate data communications for the mentioned ATM functions. Since the capacity of voice communications should be always present, VHF mode 3 appears to be the adequate candidate to integrate data and voice channels in a one RF VHF carrier.

4.3.2.3 The SARPs for VDL Mode 3 are being developed. In order to maintain harmony and coherency with the plans made for en-route navigation, the ATN plans for TMA operations should be the same for the en-route operations.

4.3.3 **Navigation**

4.3.3.1 In relation with navigation, the States should apply the CAR/SAM strategy for the development of GNSS in the CAR/SAM Regions to progressively phase-out the conventional nav aids. Air operations for en-route terminal and landing using the GNSS concept, would be performed in the initial stage by using the GPS satellite constellation.

4.3.4 **Surveillance**

4.3.4.1 For surveillance, the SSR modes A/C would be the basic means for this function in the places where this facility is justified. However although no specific dates have been indicated to establish the ADS-C (ADS environment), this kind of surveillance should appear once the conditions are given, and should be in agreement with the plans outlined for the en-route services. Surveillance with ADS-B is not so clearly envisaged and would have possibilities to be established by means of the SSR Mode S extended squitter and VHF Mode 4.

ATTACHMENT A

TABLES ON ATM EVOLUTION IN THE CAR/SAM REGIONS - ENROUTE OPERATIONS

EXPLANATORY NOTES TO THE TABLES ON ATM EVOLUTION IN THE CAR/SAM REGIONS - ENROUTE OPERATIONS

1. **Traffic Flow**

It indicates the main international traffic flow between the points of origin and destiny and its corresponding ATM homogeneous area.

Note 1: Definition of **traffic flow**: Geographical bands defined by points of origin and destiny (the traffic flows can cross over many ATM homogeneous areas).

Note 2: Definition of **homogeneous ATM area**: Areas in which, among other things, have similar traffic density and complexity and similar air navigation infrastructure requirements.

2. **Airspace**

It describes the type of airspace, be it continental, oceanic, or both.

3. **Traffic Density**

It indicates the density of traffic in the airspace in question.

4. **FIRs involved**

The Flight Information Regions (FIRs) which the traffic flow in question cross are listed here.

5. **Current Operational Situation**

It describes in general terms the separations currently used in the traffic flow in question, as well as the status of communications, navigation, surveillance and the typical aircraft fleet operating in that airspace.

6. **ATM Evolution**

It indicates the various ATM functions which could be implemented to achieve an ATM evolution satisfying the requirements for safety, capacity, efficiency and regularity of international air operations.

7. **Minimum On Board Requirements**

Minimum requirements with regard to equipment and procedures which aircraft must follow to comply with the corresponding ATM evolution.

8. **Minimum Ground Requirement Services**

Minimum requirements with regard to equipment and procedure which the ATS units must follow to comply with the corresponding ATM evolution.

9. **Implementation Date**

It indicates the tentative implementation date in which the referred ATM functions are expected to be available.

Note: The early application of the ATM function will be able to be carried out preferably on the basis of agreements between States.

10. **Remarks**

Self-explanatory.

11. **Tracks/ATS Routes**

It indicates the type of route/track to be applied.

12. **Longitudinal Separations between Aircraft in Tracks/ATS Routes**

It indicates the evolution of the minimum longitudinal separations to be applied.

13. **Spacing between Tracks/ATS Routes**

It indicates the evolution of the minimum spacing to be applied between ATS tracks/routes.

14. **Reduced Vertical Separation Minima**

It indicates the evolution of the reduced vertical separation minima (RVSM) application to 1000 ft between FL 290 and FL 410.

15. **Airspace Management (ASM)**

It indicates the evolution of the airspace management to be applied.

16. **Air Traffic Flow Management (ATFM)**

It indicates the evolution of the air traffic flow management to be applied.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 1

1 TRAFFIC FLOW	BUENOS AIRES – SANTIAGO DE CHILE (AH1)		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE	CONTINENTAL		-10 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION - CONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS -RNAV/ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)	LOW			
4 FIRs INVOLVED	EZEIZA, MENDOZA AND SANTIAGO			
6 ATM EVOLUTION	7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 ATS TRACKS / ROUTES				
-FIXED RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT	TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES				
- 10 MIN MINIMUM	- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	-	-IMPLEMENTED
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)	- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2002	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2006	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN ATS TRACKS/ROUTES				
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-NON APPLICABLE IN THIS FLOW
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-NON APPLICABLE IN THIS FLOW

TABLE1

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2002	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2006	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
-ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK .
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 2

1 TRAFFIC FLOW		BUENOS AIRES – SAO PAULO/RIO DE JANEIRO		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL		-10 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION - CONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS -RNAV/ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		EZEIZA, MONTEVIDEO , CURITIBA AND BRASILIA							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2003		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		-		-IMPLEMENTED	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2002			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2005		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	

TABLE 2

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2002	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2005	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (30) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVATIONS, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 3

1 TRAFFIC FLOW		SANTIAGO DE CHILE – SAO PAULO/RIO DE JANEIRO (AH1)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL		-10 AND 15 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION - CONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS -RNAV/ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		SANTIAGO, MENDOZA, CORDOBA, RESISTENCIA, ASUNCION, CURITIBA AND BRASILIA							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2000		-HARMONIZE SEPARATION AT FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2002			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2006		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	

TABLE 3

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2002	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2006	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 OR MORE AIRCRAFT OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 4

1 TRAFFIC FLOW		SAO PAULO/RIO DE JANEIRO – EUROPE (AH1)		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE		CONTINENTAL / OCEANIC		-10 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION - CONTINENTAL CONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS - 100 NM LATERAL OCEANIC SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)		LOW			
4 FIRs INVOLVED		BRASILIA, RECIFE (DAKAR – AFI)			
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 ATS TRACKS / ROUTES					
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	1999 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT		TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES					
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	-	-IMPLEMENTED
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN ATS TRACKS/ROUTES					
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-IMPLEMENTED WITHOUT RNP CERTIFICATION/PUBLICATION
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	1999	-ACCORDING TO PLAN IN PREPARATION BY SOUTH ATLANTIC (SAT) GROUP OF STATES

TABLE 4

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)		-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	2004	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574) - PLANNING ELABORATED BY SOUTH ATLANTIC (SAT) GROUP OF STATES
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION -AUTOMATION	2006	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- (1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- (2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- (3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- (4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- (5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 5

1 TRAFFIC FLOW		SAO PAULO/RIO DE JANEIRO – LIMA (AH3)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL		-10 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION - ONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		BRASILIA, CURITIBA, LA PAZ AND LIMA							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS / ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		-		-IMPLEMENTED	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2002			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2006		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	

TABLE 5

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2002	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2006	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	2008	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- (1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- (2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- (3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- (4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- (5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 6

1 TRAFFIC FLOW	SANTIAGO – LIMA – LOS ANGELES		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE	OCEANIC		-10 AND 15 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION - 120 NM OCEANIC LATERAL SEPARATION - RNAV/ ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)	LOW			
4 FIRs INVOLVED	SANTIAGO, ANTOFAGASTA, LIMA, GUAYAQUIL,, CENTRAL AMERICA, MERIDA, MEXICO, MAZATLAN (LOS ANGELES)			
6 ATM EVOLUTION	7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 ATS TRACKS / ROUTES				
-FIXED RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT	TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS / ROUTES				
- 10 MIN MINIMUM	- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	2001	-HARMONIZE SEPARATION AT FIRS LIMITS
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)	- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN ATS TRACKS/ROUTES				
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-NON APPLICABLE IN THIS FLOW
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	

TABLE 6

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 7

1 TRAFFIC FLOW		SANTIAGO – LIMA – MIAMI (AH4)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS - 90 AND 100 NM OCEANIC LATERAL SEPARATION - ATS CONVENTIONAL ROUTES AND RNAV - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		SANTIAGO, ANTOFAGASTA, LIMA, GUAYAQUIL, BOGOTA, BARRANQUILLA, PANAMA, KINGSTON, HABANA AND MIAMI							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS / ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2001		-HARMONIZE SEPARATION BETWEEN FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444 . ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT, AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2003			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA -ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION -ADS PRESENTATION		2008		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-IMPLEMENTED IN OCEANIC AREA - RNP CERTIFICATION/PUBLICATION PENDING	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	

TABLE 7

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM./AIDC - ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING.
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	- NON APPLICABLE IN OCEANIC OR REMOTE AREA * PROCEDURES ARE CONTAINED IN DOC. 4444 . ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT, AT THE DISCRETION OF STATES.
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	- NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444 . ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT, AT THE DISCRETION OF STATES.
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	- SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444 . ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT, AT THE DISCRETION OF STATES.
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	- SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444 . ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT, AT THE DISCRETION OF STATES.
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF THE AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) - DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	- DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	- DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 8

1 TRAFFIC FLOW	SAO PAULO/RIO DE JANEIRO – LOS ANGELES (AH 3)		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE	CONTINENTAL		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL LATERAL SEPARATION ACCORDING TO SARPS - RNAV / ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)	LOW			
4 FIRs INVOLVED	BRASILIA, PORTO VELHO, BOGOTA, BARRANQUILLA, PANAMA, CENTRAL AMERICA, MERIDA, MEXICO AND MAZATLAN (LOS ANGELES)			
6 ATM EVOLUTION	7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 ATS TRACKS / ROUTES				
-FIXED RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT	TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES				
- 10 MIN MINIMUM	- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	2001	-HARMONIZE SEPARATION BETWEEN FIRS LIMITS
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)	- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION*	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2003	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN ATS TRACKS/ROUTES				
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-NON APPLICABLE IN THIS FLOW
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-NON APPLICABLE IN THIS FLOW

TABLE 8

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- (1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- (2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- (3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- (4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- (5) TRAFFIC CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 9

1 TRAFFIC FLOW		SAO PAULO/RIO DE JANEIRO – MIAMI (AH 2)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS - 90 AND 100 NMLATERAL SEPARATION - ATS CONVENTIONAL ROUTES /RNAV ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		BRASILIA, MANAUS, MAIQUETIA, CURACAO, KINGSTON, SANTO DOMINGO, PORT AU PRINCE, HABANA, MIAMI							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2001		-HARMONIZE SEPARATION AT FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2003			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2008		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS / ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-IMPLEMENTED IN OCEANIC AREA - RNP CERTIFICATION/PUBLICATION PENDING	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	

TABLE 9

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2006	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTRE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEEC COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- (1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- (2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- (3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- (4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- (5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 OR MORE AIRCRAFT OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 10

1 TRAFFIC FLOW		SAO PAULO/RIO DE JANEIRO – NEW YORK (AH 2)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS - 90 AND 100 NMLATERAL SEPARATION - ATS CONVENTIONAL ROUTES /RNAV ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		BRASILIA, BELEM, PARAMARIBO, GEORGETOWN, PIARCO AND SAN JUAN (NEW YORK)							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2001		-HARMONIZE SEPARATION AT FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENTO AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2006			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2008		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-PARTIALLY IMPLEMENTED - RNP CERTIFICATION/PUBLICATION PENDING	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2003			

TABLE 10

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM./AIDC - ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- (1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- (2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- (3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- (4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- (5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 OR MORE AIRCRAFT OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 11

1			5	
TRAFFIC FLOW	BUENOS AIRES – NEW YORK (AH 4)		CURRENT OPERATIONAL SITUATION	
2			-10 AND 15 MIN LONGITUDINAL SEPARATION -STANDARD VERTICAL SEPARATION -CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS -90 AND 100 NM LATERAL SEPARATION -ATS CONVENTIONAL ROUTES -RADAR SURVEILLANCE PARTIALLY AVAILABLE -PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS -SATISFACTORY AMS COMMUNICATIONS -NEW AND OLD GENERATION AIRCRAFT FLEET	
AIRSPACE	CONTINENTAL / OCEANIC			
3	LOW			
4				
FIRs INVOLVED	EZEIZA, RESISTENCIA, ASUNCION, LA PAZ, PORTO VELHO, MANAUS, MAIQUETIA, CURACAO, SANTO DOMINGO, MIAMI (NEW YORK)			
6	7	8	9	10
ATM EVOLUTION	MINIMUM ON BOARD REQUIREMENTS	MINIMUM GROUND REQUIREMENT SERVICES	IMP. DATE	REMARKS
11				
ATS TRACKS / ROUTES				
-FIXED RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT	TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12				
LONGITUDINAL SEPARATION BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES				
- 10 MIN MINIMUM	- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	2001	-HARMONIZE SEPARATION AT FIRS LIMITS
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)	- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13				
SPACING BETWEEN TRACKS/ATS ROUTES				
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	-PARTIALLY IMPLEMENTED - RNP CERTIFICATION/PUBLICATION PENDING
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	-RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) -GROUND-GROUND SPEECH COM. (3)	- 2003	-NON APPLICABLE IN THIS FLOW
-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	-RNP 10 PUBLICATION -DCPC VOICE (1) (3) -GROUND-GROUND SPEECH COM. (3)	2006	

TABLE 11

- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	-RNP 4 PUBLICATION -DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	-RNP 4 PUBLICATION -VHF DCPC VOICE -APPROPRIATE NAV INFRASTRUCTRE -GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	-RNP 4 PUBLICATION -VHF DCPC VOICE -GROUND-GROUND SPEECH COM./AIDC (3) -APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC ORE REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	-RNP 5 PUBLICATION -VHF DCPC VOICE -GROUND-GROUND SPEEC COM./AIDC (3) -APPROPRIATE NAV INFRASTRUCTURE -RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	-RNP 4 PUBLICATION -VHF DCPC VOICE -GROUND-GROUND SPEECH COM./AIDC (3) -APPROPRIATE NAV INFRASTRUCTURE -RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE -GROUND-GROUND SPEECH COM./AIDC (3) -COM. WITH MILITARY UNITS -CIVIL/MILITARY COORDINATION -AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	-AUTOMATION -VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	-AUTOMATION -VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- (1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- (2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- (3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- (4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- (5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

(H:\CNSATM\PLANS\ACTION\TABLE11.DOC)

ATM EVOLUTION IN THE CAR/SAM REGIONS

TABLE 12

1 TRAFFIC FLOW		BUENOS AIRES – MIAMI (AH 4)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS - 90 AND 100 NMLATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		EZEIZA, RESISTENCIA, CORDOBA, LA PAZ, PORTO VELHO, BOGOTA, BARRANQUILLA, KINGSTON, HABANA (MIAMI)							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2001		- HARMONIZE SEPARATION AT FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION*		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2003			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2006		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-PARTIALLY IMPLEMENTED - RNP CERTIFICATION/PUBLICATION PENDING	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-NON APPLICABLE IN THIS FLOW	

TABLE 12

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2006	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) - DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 13

1 TRAFFIC FLOW		NORTH OF SOUTH AMERICA – EUROPE (AH 5)		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS - 90 , 100 AND 120 NMLATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)		LOW			
4 FIRs INVOLVED		GUAYAQUIL, BOGOTA, MAIQUETIA, PIARCO, (EUR)			
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 ATS TRACKS / ROUTES					
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2005	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT		TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES					
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	2001	- HARMONIZE SEPARATION AT FIRS LIMITS
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION*	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN ATS TRACKS/ ROUTES					
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2001	-PARTIALLY IMPLEMENTED
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	

TABLE 13

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA -SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA -SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) - DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 14

1 TRAFFIC FLOW		MEXICO – EUROPE (AH 6))		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS - 90 , 100 AND 120 NMLATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		MEXICO, MERIDA, HBANA, MIAMI (EUR)							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS / ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2001		- HARMONIZE SEPARATION AT FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETIONOF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2006			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2008		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN TRACKS/ATS ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		- PARTIALLY IMPLEMENTED - RNP CERTIFICATION/PUBLICATION PENDING	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2003			

TABLE 14

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 15

1 TRAFFIC FLOW		MEXICO – NORTH AMERICA (AH 3)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		CONTINENTAL / OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - CONVENTIONAL CONTINENTAL LATERAL SEPARATION ACCORDING TO SARPS - 100 NMLATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		MEXICO, MONTERREY (HOUSTON – MIAMI)							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 TRACKS / ATS ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2001		HARMONIZE SEPARATION AT FIRS LIMITS	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2006			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION		2008		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN TRACKS/ATS ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		-		-IMPLEMENTED - RNP CERTIFICATION/PUBLICATION PENDING	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2003			

TABLE 15

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE	TBD	-NON APPLICABLE IN OCEANIC OR REMOTE AREA - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE	TBD	-SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES, RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 OR MORE AIRCRAFT OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 16

1 TRAFFIC FLOW		CENTRAL AMERICA – EUROPE (AH 6)		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE		OCEANIC		- 10 AND 15 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - 60, 90, 100 AND 120 NM OCEANIC LATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE PARTIALLY AVAILABLE - PARTIALLY SATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - PARTIALLY SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)		LOW			
4 FIRs INVOLVED		CENTRAL AMERICA, PANAMA, KINGSTON, PORT AU PRINCE, CURACAO, SANTO DOMINGO, SAN JUAN (EUR)			
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 TRACKS / ATS ROUTES					
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT		TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES					
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	2001	HARMONIZE SEPARATION AT FIRS LIMITS
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETIONOF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN TRACKS/ATS ROUTES					
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	-	- PARTIALLY IMPLEMENTED - RNP PUBLICATION/CERTIFICATION PENDING
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	

TABLE 16

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	2008	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 OR MORE AIRCRAFT OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

TABLE 17

1 TRAFFIC FLOW	SOUTH AMERICA – SOUTH AFRICA (AFI)		5 CURRENT OPERATIONAL SITUATION	
2 AIRSPACE	OCEANIC		- 30 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - 120 NM OCEANIC LATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE UNAVAILABLE - UNSATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - PARTIALLY SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET	
3 TRAFFIC DENSITY (5)	LOW			
4 FIRs INVOLVED	EZEIZA, MONTEVIDEO, BRASILIA, JOHANNESBURGH (AFI)			
6 ATM EVOLUTION	7 MINIMUM ON BOARD REQUIREMENTS	8 MINIMUM GROUND REQUIREMENT SERVICES	9 IMP. DATE	10 REMARKS
11 TRACKS / ATS ROUTES				
-FIXED RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2000 (4)	-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED
- RANDOM RNAV ROUTES	- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)	- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2004	- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED
- AUTONOMOUS FLIGHT	TBD	TBD	TBD	- CONCEPT BEING DEFINED BY ICAO
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES				
- 10 MIN MINIMUM	- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION	2003	
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)	- RNAV CAPACITY - DCPC VOICE (3)	- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION	-	- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)	- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION	2008	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY	- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS PRESENTATION	TBD	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION
13 SPACING BETWEEN ATS TRACKS/ROUTES				
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 20 CERTIFICATION - DCPC VOICE (3)	- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2003	
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 12.6 CERTIFICATION - DCPC VOICE (3)	- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2006	

TABLE 17

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2008	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	TBD	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC (3)		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) - DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

ATM EVOLUTION IN THE CAR/SAM REGIONS – EN ROUTE OPERATIONS

TABLE 18

1 TRAFFIC FLOW		SANTIAGO DE CHILE – EASTER ISLAND – PAPEETE (PAC)		5 CURRENT OPERATIONAL SITUATION					
2 AIRSPACE		OCEANIC		- 30 MIN LONGITUDINAL SEPARATION - STANDARD VERTICAL SEPARATION - 120 NM OCEANIC LATERAL SEPARATION - ATS CONVENTIONAL ROUTES - RADAR SURVEILLANCE UNAVAILABLE - UNSATISFACTORY ATS SPEECH COMMUNICATION COORDINATIONS - PARTIALLY SATISFACTORY AMS COMMUNICATIONS - NEW AND OLD GENERATION AIRCRAFT FLEET					
3 TRAFFIC DENSITY (5)		LOW							
4 FIRs INVOLVED		SANTIAGO – EASTER - TAHITI							
6 ATM EVOLUTION		7 MINIMUM ON BOARD REQUIREMENTS		8 MINIMUM GROUND REQUIREMENT SERVICES		9 IMP. DATE		10 REMARKS	
11 ATS TRACKS / ROUTES									
-FIXED RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2000 (4)		-RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL/MILITARY COORDINATION FOR THE LOCATION/REDESIGN OF PROHIBITED AND RESTRICTED ZONES WILL BE REQUIRED	
- RANDOM RNAV ROUTES		- RNAV CAPACITY - RNP X CERTIFICATION - DCPC VOICE (3)		- RNP X PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2004		- RNP CERTIFICATION AND PUBLICATION WILL DEPEND OF AIRSPACE AND/OR ATS ROUTES CONCERNED - WHEN NECESSARY, CIVIL /MILITARY AGREEMENT FOR FLEXIBLE USE OF AIRSPACE WIL BE REQUIRED	
- AUTONOMOUS FLIGHT		TBD		TBD		TBD		- CONCEPT BEING DEFINED BY ICAO	
12 LONGITUDINAL SEPARATIONS BETWEEN AIRCRAFT IN ATS TRACKS/ROUTES									
- 10 MIN MINIMUM		- NAV CAPACITY ACCORDING TO AIRSPACE - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - NAV AIDS OR MNT APPLICATION		2003			
- 80 NM MINIMUM RNAV (NON RADAR ENVIRONMENT)		- RNAV CAPACITY - DCPC VOICE (3)		- DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3) - MNT APPLICATION - 60' MAXIMUM POSITION INFORMATION		-		- PROCEDURES ARE CONTAINED IN DOC. 4444. ITS IMPLEMENTATION IS POSSIBLE AT ANY MOMENT AT THE DISCRETION OF STATES.	
- 50 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 10 CERTIFICATION - DCPC VOICE (3)		- RNP 10 PUBLICATION -DCPC VOICE (1) - GROUND-GROUND SPPECH COM. (3) - MNT APPLICATION - 30' MAXIMUM POSITION INFORMATION		2008			
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)		- FMS (2) - RNP 4 CERTIFICATION - DCPC VOICE AND DATA - ADS CAPACITY		- RNP 4 PUBLICATION - DCPC VOICE AND DATA - GROUND-GROUND SPEECH COM. AND AIDC - MNT APPLICATION - ADS SPACING		TBD		- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SEPARATION	
13 SPACING BETWEEN ATS TRACKS/ ROUTES									
- 100 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 20 CERTIFICATION - DCPC VOICE (3)		- RNP 20 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2003			
- 60 NM MINIMUM (NON RADAR ENVIRONMENT)		- RNP 12.6 CERTIFICATION - DCPC VOICE (3)		- RNP 12.6 PUBLICATION -DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)		2006			

TABLE 18

-50 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 10 CERTIFICATION -DCPC VOICE (3)	- RNP 10 PUBLICATION - DCPC VOICE (1) (3) - GROUND-GROUND SPEECH COM. (3)	2002	
- 30 NM MINIMUM (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION -DCPC VOICE AND DATA -ADS	- RNP 4 PUBLICATION - DCPC VOICE AND DATA -GROUND-GROUND SPEECH COM./AIDC -ADS	TBD	- CORRESPONDING SARPS NOT AVAILABLE FOR THIS SPACING
- 18 NM MINIMUM (BIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - APPROPRIATE NAV INFRASTRUCTURE - GROUND-GROUND SPEECH COM./AIDC(3)		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- 16.5 MINIMUM (UNIDIRECTIONAL) (NON RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
-BETWEEN 10 AND 15 NM (RADAR ENVIRONMENT)	- RNP 5 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 5 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
- BETWEEN 8 AND 12 NM (RADAR ENVIRONMENT)	- RNP 4 CERTIFICATION - VHF DCPC VOICE - SSR TRANSPONDER	- RNP 4 PUBLICATION - VHF DCPC VOICE - GROUND-GROUND SPEECH COM. /AIDC (3) - APPROPRIATE NAV INFRASTRUCTURE - RADAR SURVEILLANCE		- NON APPLICABLE IN OCEANIC OR REMOTE AREA
14 REDUCED VERTICAL SEPARATION MINIMA				
-RVSM 1000 FT BETWEEN FL290 AND 410	- RVSM CERTIFICATION -DCPC VOICE (3)	-*SUPERVISION OF SYSTEM PERFORMANCE -DCPC VOICE (3) - GROUND-GROUND SPEECH COM.	TBD	- REGIONAL AGREEMENT REQUIRED -* REFER TO RVSM IMPLEMENTATION MANUAL (DOC 9574)
15 AIRSPACE MANAGEMENT (ASM)				
- ENHANCED FLEXIBLE USE OF AIRSPACE	- NAV. CAPACITY ACCORDING TO AIRSPACE -DCPC VOICE (3) -DATA LINK	-DCPC VOICE - GROUND-GROUND SPEECH COM./AIDC (3) - COM. WITH MILITARY UNITS - CIVIL/MILITARY COORDINATION - AUTOMATION	TBD	- AGREEMENTS ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
16 AIR TRAFFIC FLOW MANAGEMENT (ATFM)				
-FMU	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2008	- DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.
-ATFM	-DATA LINK	- AUTOMATION - VOICE AND DATA COM. (ICC)	2010	- CENTRALIZED ATFM REQUIRES A REGIONAL AGREEMENT - DATA BASE WILL CONTAIN INFORMATION SUCH AS, AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

- 1) SPEECH COMMUNICATIONS THROUGH A THIRD PARTY (AERONAUTICAL TELECOMMUNICATIONS STATION) AT THE CRITERION OF COMPETENT ATS AUTHORITY ON THE BASIS OF AN EVALUATION OF THE IMPACT OF THIS COMMUNICATIONS METHOD IN THE PROVISION OF ATS AND THE CONSEQUENT EFFECT OF THE SAFETY OF AIR OPERATIONS WITHIN THE AIRSPACE IN QUESTION.
- 2) IT IS ASSUMED THAT FMS AVAILABILITY INCLUDES RNAV CAPACITY.
- 3) FOR AIR TRAFFIC SERVICES , RADIOTELEPHONY WILL BE USED IN AIR-GROUND AND GROUND-GROUND COMMUNICATIONS AND COULD BE IMPROVED WITH DATA LINK.
- 4) DATE REFERS TO IMPLEMENTATION OF NEW RNAV ROUTES WITH RNP REQUIREMENTS.
- 5) TRAFFIC IS CONSIDERED TO BE OF HIGH DENSITY WHEN 100 AIRCRAFT OR MORE OPERATE AT A GIVEN TIME WITHIN A CIRCLING HAVING A RADIUS OF 250 NM.

(H:\CNSATM\PLANS\ACTION\TABLE18.DOC)

ATTACHMENT B

CNS IMPLEMENTATION TABLES FOR ENROUTE OPERATIONS BY FLIGHT INFORMATION REGIONS COMMON INFORMATION TO THE FIRs

REGIONAL COMMUNICATIONS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS DE COMUNICACIONES

[illegible]

REGIONAL NAVIGATION SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS DE NAVEGACION

[illegible]

REGIONAL SURVEILLANCE SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS DE VIGILANCIA

SURVEILLANCE SYSTEMS IMPLEMENTATION, COMMON DATA TO THE FIRs/ IMPLANTACION DE LOS SISTEMAS DE VIGILANCIA, DATOS COMUNES A LAS FIRs			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Development of SARPs/Desarrollo de SARPs	R	ADS																	
	N	ADS-B*																	
	P	SSR Mode S/SSR Modo S																	
Aircraft equipage/ Equipo de abordó		ADS																	
		ADS-B	(TBD)																
		SSR Mode S/SSR Modo S																	

*Emerging concept or technology concensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente

**CNS IMPLEMENTATION TABLES FOR ENROUTE OPERATIONS BY
FLIGHT INFORMATION REGIONS
CAR REGION**

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: CENAMER (CA/OA)

[illegible]

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: CURACAO (CA/OA)

[illegible]

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: HAVANA (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: HOUSTON (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: KINGSTON (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: LOS ANGELES (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: MAZATLAN (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: MERIDA (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: MEXICO (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: MIAMI (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: MONTERREY (CA/OA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: NEW YORK (CA/OA)

COMMUNICATIONS/COMUNICACIONES																			
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																		
	HF data/datos HF (OA)																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: PIARCO (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: PORT-AU-PRINCE (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
 IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: SAN JUAN (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: SANTO DOMINGO (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**CNS IMPLEMENTATION TABLES FOR ENROUTE OPERATIONS BY
FLIGHT INFORMATION REGIONS
SAM REGION**

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: ANTOFAGASTA (OA/CA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: ASUNCION (CA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: BARRANQUILLA (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: BELEM (CA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: BOGOTA (CA/OA)

		COMMUNICATIONS/COMUNICACIONES																	
CA: Continental area/Área continental																			
OA: Oceanic area/Área Oceánica																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																		
	HF data/datos HF (OA)																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
		NAVIGATION/NAVEGACION																	
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
	Precision approach/Aproximacion de precision																		
		SURVEILLANCE/VIGILANCIA																	
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: BRASILIA (OA/CA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA/CA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: CORDOBA (CA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: CURITIBA (OA/CA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: EZEIZA (OA/CA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA/CA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: GEORGETOWN (CA/OA)

COMMUNICATIONS/COMUNICACIONES																			
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
Uso Operacional	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: GUAYAQUIL (CA/OA)

		COMMUNICATIONS/COMUNICACIONES																	
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																		
	HF data/datos HF (OA)																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
Uso Operacional	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: LA PAZ (CA)

COMMUNICATIONS/COMUNICACIONES																			
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																		
	HF data/datos HF (OA)																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: LIMA (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: MAIQUETIA (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: MANAUS (CA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
 IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: MENDOZA (CA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: MONTEVIDEO (OA/CA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: PANAMA (CA/OA)

COMMUNICATIONS/COMUNICACIONES		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: PARAMARIBO (CA/OA)

COMMUNICATIONS/COMUNICACIONES																			
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
Uso Operacional	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: PORTO VELHO (CA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: RECIFE (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: RESISTENCIA (CA)

COMMUNICATIONS/COMUNICACIONES																			
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: SANTIAGO (OA/CA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

CNS IMPLEMENTATION TABLES FOR ENROUTE OPERATIONS BY

FLIGHT INFORMATION REGIONS

OTHER ICAO REGIONS

**REGIONAL CNS SYSTEMS IMPLEMENTATION
 IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: DAKAR (OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

REGIONAL CNS SYSTEMS IMPLEMENTATION IMPLANTACION REGIONAL DE LOS SISTEMAS CNS

FIR: EUR (CA/OA)

COMMUNICATIONS/COMUNICACIONES																		
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																	
	HF data/datos HF																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																	
	HF data/datos HF (OA)																	
	VHF data/datos VHF																	
	SSR Mode S/SSR Modo S																	
	ATN																	
NAVIGATION/NAVEGACION																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																	
	GNSS + ABAS + SBAS																	
	GNSS + ABAS + GBAS																	
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																	
	En-route supplementary/En ruta suplementario																	
	Primary/Primario																	
	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	
SURVEILLANCE/VIGILANCIA																		
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Trials and Demonstration/ Ensayos y Demostraciones	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																	
	ADS-B*																	
	SSR Mode S/SSR Modo S																	

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
 IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: JOHANNESBURG (OA)

COMMUNICATIONS/COMUNICACIONES																			
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
Uso Operacional	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

**REGIONAL CNS SYSTEMS IMPLEMENTATION
 IMPLANTACION REGIONAL DE LOS SISTEMAS CNS**

FIR: PASCUA (TAHITI) (OA)

		COMMUNICATIONS/COMUNICACIONES																	
CA: Continental area/Area continental OA: Oceanic area/Area Oceánica																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	AMSS																		
	HF data/datos HF																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
Implementation and Operational Use/ Implantación y Uso Operacional	AMSS (OA)																		
	HF data/datos HF (OA)																		
	VHF data/datos VHF																		
	SSR Mode S/SSR Modo S																		
	ATN																		
NAVIGATION/NAVEGACION																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstrations/ Ensayos y Demostraciones	GNSS + ABAS																		
	GNSS + ABAS + SBAS																		
	GNSS + ABAS + GBAS																		
Implementation and Operational Use/ Implantación y Uso Operacional	WGS-84																		
	En-route supplementary/En ruta suplementario																		
	Primary/Primario																		
	Terminal/NPA																		
	Precision approach/Aproximacion de precision																		
SURVEILLANCE/VIGILANCIA																			
		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Trials and Demonstration/ Ensayos y Demostraciones	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		
Implementation and Operational Use/ Implantación y Uso Operacional	ADS																		
	ADS-B*																		
	SSR Mode S/SSR Modo S																		

*Emerging concept or technology-consensus still to be reached/Concepto emergente o consenso tecnológico aún pendiente.

ATTACHMENT C

TABLE ON ATM EVOLUTION IN THE CAR/SAM REGIONS - OPERATIONS IN TERMINAL AREAS (TMA)

**EXPLANATORY NOTES TO THE TABLES ON ATM EVOLUTION
IN THE CAR/SAM REGIONS - OPERATIONS IN TERMINAL AREAS (TMA)**

1. ATM Evolution in Terminal Areas

It indicates the various ATM functions which would be implemented in order to achieve an ATM evolution satisfying the requirements of safety, capacity, efficiency and regularity of international air operations in Terminal Areas (TMA).

2. On Board Requirements

Minimum requirements with regard to equipment and procedures which aircraft must have to comply with the corresponding ATM evolution.

3. Ground Requirements

Minimum requirements with regard to equipment and procedures which the ATS units must have to comply with the corresponding ATM evolution.

4. Implementation date

The dates indicated shall serve as reference. The implementation dates of each of the referred ATM functions will be determined by States for each TMA in particular, taking into account operational requirements and corresponding technological and economical aspects.

5. Remarks

Self-explanatory.

6. Airspace Management (ASM)

It indicates the evolution of the airspace management to be applied.

7. Air Traffic Services (ATS)

It indicates the evolution of the air traffic services to be applied.

8. Air Traffic Flow Management (ATFM)

It indicates the evolution of the air traffic flow management to be applied.

ATM EVOLUTION IN THE CAR/SAM REGIONS OPERATIONS IN TERMINAL AREAS (TMA)

Note: States should examine the situation of their terminal areas (TMA) in the areas relative to airspace management (ASM), air traffic services (ATS) and air traffic flow management (ATFM).

1. ATM EVOLUTION IN TERMINAL AREAS	2. ON BOARD REQUIREMENTS	3. GROUND REQUIREMENTS	4. IMPLEMENTATION DATE (2)	5. REMARKS
6. AIRSPACE MANAGEMENT (ASM)				
OPTIMIZED SECTORIZATION	- VHF DCPC VOICE	-VHF DCPC VOICE - DEFINITION OF SECTORIZATION, INFRASTRUCTURE AND HUMAN RESOURCES	2000	
CONVENTIONAL SID/STAR IMPLEMENTATION	- VHF DCPC VOICE - CONVENTIONAL NAVIGATION CAPACITY	- VHF DCPC VOICE - DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURES	2000	- SID/STARs ARE NORMALLY NECESSARY AT HIGH TRAFFIC FLOW AERODROMES AND SHOULD BE KEPT TO THE MINIMUM POSSIBLE TAKING INTO CONSIDERATION THE SAFE, ORDERLY AND FAST AIR TRAFFIC CIRCULATION (REF ANNEX 11 AND DOC. 9426) - PRIOR TO IMPLEMENTATION, COORDINATION WITH USERS IS RECOMMENDED
SID/STAR RNAV IMPLEMENTATION WITH RNP REQUIREMENTS	- VHF DCPC VOICE - RNAV NAVIGATION CAPACITY - RNP 1 CERTIFICATION	- VHF DCPC VOICE - DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURES - RNP 1 PUBLICATION - WGS-84 COORDINATES	2002	
18 NM BIDIRECTIONAL TRACKS/ROUTES SPACING (NON RADAR ENVIRONMENT)	- VHF DCPC VOICE - RNP 4 CERTIFICATION	- VHF DCPC VOICE - RNP 4 PUBLICATION - APPROPRIATE NAVIGATION CAPACITY - GROUND-GROUND SPEECH CIRCUITS	-	- IMPLEMENTATION UPON STATES CRITERIA - SARPS ARE CONTAINED IN ANNEX 11 (AMENDMENT 38 APPLICABLE NOVEMBER 1998)
16.5 NM UNIDIRECTIONAL TRACKS/ROUTES SPACING (NON RADAR ENVIRONMENT)	- VHF DCPC VOICE - RNP 4 CERTIFICATION	- VHF DCPC VOICE - RNP 4 PUBLICATION - APPROPRIATE NAVIGATION CAPACITY - GROUND-GROUND SPEECH CIRCUITS	-	- IMPLEMENTATION UPON STATES CRITERIA - SARPS ARE CONTAINED IN ANNEX 11 (AMENDMENT 38 APPLICABLE NOVEMBER 1998)
10 TO 15 NM TRACKS/ROUTES SPACING (RADAR ENVIRONMENT)	- VHF DCPC VOICE - RNP 5 CERTIFICATION - SSR TRANSPONDER	- VHF DCPC VOICE - RNP 5 PUBLICATION - GROUND-GROUND SPEECH CIRCUITS - APPROPRIATE NAVIGATION INFRASTRUCTURE - RADAR SURVEILLANCE	-	- SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - IMPLEMENTATION UPON STATES CRITERIA - SARPS ARE CONTAINED IN ANNEX 11 (AMENDMENT 38 APPLICABLE NOVEMBER 1998)
8 TO 12 NM TRACKS/ROUTES SPACING (RADAR ENVIRONMENT)	- VHF DCPC VOICE - RNP 4 CERTIFICATION - SSR TRANSPONDER	- VHF DCPC VOICE - RNP 4 PUBLICATION - GROUND-GROUND SPEECH CIRCUITS - APPROPRIATE NAVIGATION INFRASTRUCTURE - RADAR SURVEILLANCE	-	- SAFETY OF SYSTEM MUST BE EVALUATED, INCLUDING VOLUME OF WORK OF CONTROLLER - IMPLEMENTATION UPON STATES CRITERIA - SARPS ARE CONTAINED IN ANNEX 11 (AMENDMENT 38 APPLICABLE NOVEMBER 1998)
OPTIMIZATION OF AIRSPACE USE	- VHF DCPC VOICE - NAVIGATION CAPACITY ACCORDING TO AIRSPACE	-VHF DCPC VOICE -GROUND-GROUND SPEECH CIRCUITS -COMMUNICATION WITH MILITARY UNITS -CIVIL/MILITARY COORDINATION	2000	-AGREEMENTS AMONG CIVIL AND MILITARY AUTHORITIES ARE REQUIRED TO OPTIMIZE THE USE OF PROHIBITED AND RESTRICTED ZONES IN ORDER TO ACHIEVE ATS ROUTES AS DIRECT AS POSSIBLE
7. AIR TRAFFIC SERVICES				
HORIZONTAL SEPARATION (LONGITUDINAL/LATERAL) IN RADAR ENVIRONMENT	- VHF DCPC VOICE - CONVENTIONAL NAVIGATION CAPACITY - SSR TRANSPONDER	- VHF DCPC VOICE - ACCORDING TO SARPS - RADAR SURVEILLANCE	-	-IMPLEMENTATION OF RADAR SYSTEM ACCORDING TO OPERATIONAL REQUIREMENTS AND SPECIFIC STUDIES FOR EACH TMA (REF. DOC 9426, CAR/SAM/2 REC. 14/31; GREPECAS ATS/SG DRAFT CONCLUSION 8/7) - PRIOR COORDINATION WITH USERS IS RECOMMENDED
HORIZONTAL SEPARATION (LONGITUDINAL/LATERAL) IN ADS/ADS-B ENVIRONMENT	- VHF DCPC VOICE - NAVIGATION CAPACITY AS REQUIRED - ADS / ADS-B CAPACITY (1)	- VHF DCPC VOICE - PRESENTATION OF SITUATION FOR ADS/ADS-B (1)	TBD	-CORRESPONDING SARPS NOT YET AVAILABLE

RNAV NON PRECISION APPROACHES FOR OVERLAY GNSS (SUPPLEMENTARY GNSS)	- VHF DCPC VOICE - GNSS NAVIGATION CAPACITY - RNP 0.3 CERTIFICATION - ABAS	-VHF DCPC VOICE -WGS-84 COORDINATES - APPROVAL OF GNSS AS SUPPLEMENTARY NAVIGATION SYSTEM - DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURE	2002	-IN AWOP/16 REPORT THERE ARE REFERENCES WITH REGARD TO RNP FOR NON PRECISION APPROACHES
RNAV NON PRECISION APPROACHES FOR GNSS (PRIMARY GNSS)	-VHF DCPC VOICE - GNSS NAV. CAPACITY -CERTIFICACION RNP 0.3 -ABAS*	-VHF DCPC VOICE -WGS-84 COORDINATES -GPS APPROVAL AS PRIMARY NAVIGATION SYSTEM -DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURE - SBAS AUGMENTATION// PREDICTIVE FDE	TBD	-SBAS AUGMENTATION SYSTEM HAS NOT YET BEEN DETERMINED FOR CAR/SAM REGIONS. SUBJECT TO GREPECAS APPROVAL * AIRCRAFT-BASED AUGMENTATION SYSTEMS PROVIDE LIMITED AVAILABILITY OF SERVICE. THIS MAY LEAD TO OPERATIONAL RESTRICTIONS BASED ON PREDICTION OF ONE SATELLITE CONSTELLATION STATUS BEFORE DEPARTURE.
NON-PRECISION APPROACHES WITH VERTICAL IPV GUIDANCE FOR GNSS (1)	-VHF VOICE DCPC -GNSS NAV. CAPACITY -RNP 0.125 CERTIFICATION FOR IPV -ABAS -FMS	-VOICE DCPC -IMPLEMENTATION OF WGS'94 COORDINATES -MAPPING DATA BASE -SBAS AUGMENTATION -DESIGN/FLIGHT INSPECTION /PUBLICATION OF PROCEDURE	TBD	TO BE DECIDED WHETHER IPV IS TO BE CONSIDERED AS AN NON PRECISION APPROACH (NPA) OR AS A PRECISION APPROACH (PA) WITH MINIMA GREATER THAN CAT1.
PRECISION APPROACHES (ILS)	- ILS RECEIVER	- DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURE - ILS EQUIPMENT	-	-ILS PLANNING WILL BE CARRIED OUT ACCORDING TO OPERATIONAL REQUIREMENTS AND SPECIFIC STUDIES CONSIDERING SHORT AND MEDIUM TERM - PREVIOUS CCORDINATION WITH USERS IS RECOMMENDED
CAT I GNSS PRECISION APPROACHES	- VHF DCPC VOICE - GNSS NAVIGATION CAPACITY - RNP CERTIFICATION FOR CAT I - ABAS	-DCPC VHF VOICE - WGS-84 COORDINATES - DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURE - SBAS, GBAS AUGMENTATION* - CORRESPONDING RNP PUBLICATION	TBD	-CORRESPONDING SARPS NOT YET AVAILABLE FOR THESE APPROACHES - PERMITS CURVED AND SEGMENTED APPROACHES AND IFR INDEPENDENT APPROACHES TO CLOSELY-SPACED RUNWAYS * SUBJECT TO GREPECAS APPROVAL
CAT II AND CAT III GNSS PRECISION APPROACHES	- VHF DCPC VOICE - GNSS NAVIGATION CAPACITY - RNP CERTIFICATION FOR CAT II AND III - ABAS	-VHF DCPC VOICE -WGS-84 COORDINATES - DESIGN/FLIGHT INSPECTION/PUBLICATION OF PROCEDURE - GBAS AUGMENTATION - CORRESPONDING RNP PUBLICATION	TBD	-CORRESPONDING SARPS NOT YET AVAILABLE FOR THESE APPROACHES - PERMITS CURVED AND SEGMENTED APPROACHES AND IFR INDEPENDENT APPROACHES TO CLOSELY-SPACED RUNWAYS
MINIMUM SAFE ALTITUDE WARNING (MSAW)	- SSR TRANSPONDER	- DISPLAY WITH MSAW SOFTWARE -DEFINITION OF MSAW SECTORS		-MSAW CAPACITY SHOULD BE TAKEN INTO CONSIDERATION IN ALL NEW SYSTEMS AND, AS POSSIBLE, ITS IMPLEMENTATION IN THE CURRENT SYSTEMS. SSR TRANSPONDER C/S
CONFLICT PREDICTION, ALERT AND RESOLUTION ADVICE	-VHF DCPC VOICE - SSR TRANSPONDER - ADS OR ADS-B AVIONICS (1)	-VHF DCPC VOICE -SURVEILLANCE (SSR/ADS) WITH SOFTWARE FOR ADVICE IN CONFLICT PREDICTION, WARNING AND SOLUTION		- THE CAPACITY FOR CONFLICT PREDICTION, ALERT AND RESOLUTION ADVICE SHOULD BE TAKEN INTO CONSIDERATION IN ALL NEW SYSTEMS AND, AS POSSIBLE, ITS IMPLEMENTATION IN THE CURRENT SYSTEMS
AUTOMATIC TERMINAL INFORMATION SERVICE – VOICE (ATIS-VOICE)	- VHF RECEIVER	- ATIS SYSTEM		-ATIS IMPLEMENTATION WILL BE CARRIED OUT ACCORDING TO OPERATIONAL REQUIREMENTS
DATA LINK AUTOMATIC TERMINAL INFORMATION SERVICE (D-ATIS)	- DATA LINK	- D-ATIS SYSTEM	TBD	-AMENDMENT 38 TO ANNEX 11, APPLICABLE ON NOVEMBER 1998, CONTEMPLATES THE PROVISION OF D-ATIS -IMPLEMENTATION POSSIBLE AT ANY TIME AT THE DISCRETION OF STATES
PRE-DEPARTURE CLEARANCE (PDC) AND TAXIWAY CLEARANCE	- DCPC VOICE AND DATA	- DCPC VOICE AND DATA	2000	-IMPLEMENTATION POSSIBLE AT ANY TIME AT THE DISCRETION OF STATES
ARRIVED METERING, SEQUENCING, SPACING	- DCPC VOICE AND DATA - FMS	- DCPC VOICE AND DATA - SOFTWARE FOR ARRIVAL REGULATION	TBD	

FUNCTIONAL INTEGRATION OF GROUND WITH AIRBORNE SYSTEM	- DCPC VHF VOICE AND DATA - FMS - ADS/ADS-B AVIONICS (1)	- DCPC VHF VOICE AND DATA - PRESENTATION OF {ADS/ADS-B} STATUS (1) - LIGHTING SYSTEMS - AUTOMATION	TBD	
ENHANCED GROUND SURVEILLANCE AND GUIDANCE, RUNWAY INCURSION ALERT	-DCPC VHF VOICE AND DATA - GNSS NAVIGATION CAPACITY - ADS-B AVIONICS (1) - DATA LINK	- DCPC VHF VOICE AND DATA - GBAS - PRESENTATION OF THE ADS-B STATUS (1) - WARNING SYSTEMS	TBD	- THE PRECISION OF THE INFORMATION AVAILABLE SHOULD BE COMPATIBLE WITH THE ASMGCS
WINDSHEAR DETECTION	- DCPC VHF VOICE AND DATA - METEOROLOGICAL INFORMATION RECEIVER	- DCPC VHF VOICE AND DATA - WIND SHEAR SENSORS		IMPLEMENTATION POSSIBLE AT ANY TIME AT THE DISCRETION OF STATES
8. AIR TRAFFIC FLOW MANAGEMENT				
FMU INTEGRATION	- DATA LINK	- AUTOMATION - VOICE AND DATA COM MUNICATIONS (ICC)	2008	-THE DATA BASE WILL CONTAIN INFORMATION SUCH AS AIRSPACE RESERVES, AERONAUTICAL INFORMATION, AERODROMES, TRAFFIC, MET, SAR, ETC.

Note (1): New concept or technological consensus not yet reached

Note (2): The indicated dates will serve as reference. Implementation dates of each of the evolution elements will be determined by States for each TMA in particular, taking into account operational requirements and corresponding technological and economical aspects.

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ATTACHMENT D

CNS IMPLEMENTATION TABLES FOR OPERATIONS IN TERMINAL AREAS (TMA)

COMMUNICATIONS SYSTEM IMPLEMENTATION - TMA OPERATIONS/ IMPLANTACION DEL SISTEMA DE COMUNICACIONES - OPERACIONES TMA

[illegible]

NAVIGATION SYSTEM IMPLEMENTATION - TMA OPERATIONS/ IMPLANTACION DEL SISTEMA DE NAVEGACION - OPERACIONES TMA

[illegible]

SURVEILLANCE SYSTEM IMPLEMENTATION - TMA OPERATIONS IMPLANTACION DEL SISTEMA DE VIGILANCIA - OPERACIONES TMA
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			1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Preparation of SARPs/Preparación de SARPs	R	ADS																	
	S	ADS-B*																	
	P	SSR Mode S/SSR Modo S																	
Aircraft equipage/Equipo de aeronave		ADS	(TBD)																
		ADS-B*																	
		SSR Mode S/SSR Modo S																	
Pre-operational Trials/Pruebas Pre-operacionales		ADS																	
		ADS-B*																	
		SSR Mode S/SSR Modo S																	
Implementation and Operational Use/Implantación y Uso Operacional		ADS																	
		ADS-B (TBD)																	
		SSR Mode S/SSR Modo S																	

APPENDIX/APENDICE

GLOSARIO DE ACRONIMOS/ACRONYMS GLOSSARY

AAC	Comunicación aeronáutica administrativa Aeronautical administrative communication
AAD	Desviación respecto a la altitud asignada Assigned altitude deviation
AAGDI	Intercambio automatizado de datos aire/tierra Automated air/ground data interchange
AAIM	Autonomous aircraft integrity management Gestión autónoma de la integridad de la aeronave
AAS	Sistema automatizado de tecnología avanzada Advanced automated system
ABAS	Sistema de aumentación basado en las aeronaves Aircraft-based augmentation system
ABI	Información anticipada sobre límite Advance boundary information
ACARS	Sistema de direccionamiento e informe para comunicaciones de aeronaves Aircraft communication addressing and reporting system (ARINC)
ACAS	Sistema anticolidión de a bordo Airborne collision avoidance system
ACC	Centro de control de área Area control center
ADC	Plano de aeródromo Aerodrome chart
ADI	Indicadores de demanda total Aggregate demand indicators
ADIZ	Zona de identificación de defensa aérea Air defence identification zone
ADL	Enlace de datos aeronáutico Aeronautical data link
ADLP	Procesador de enlace de datos automático Automatic data link processor
ADO	Oficina de aeródromo Aerodrome office
ADS	Vigilancia dependiente automática Automatic dependent surveillance
ADS/B	Vigilancia dependiente automática-radiodifusión Automatic dependent surveillance-broadcasting
ADS/C	Vigilancia dependiente automática-contrato Automatic dependent surveillance-contract
ADSP	Grupo de expertos sobre la vigilancia dependiente automática Automatic dependent surveillance panel
AEEC	Comité de ingeniería electrónica de las líneas aéreas Airlines electronic engineering committee
AERA	ATC automatizado en ruta Automated-en route ATC
AES	Estación terrena de a bordo Aircraft earth station
AFS	Servicio fijo aeronáutico Aeronautical fixed service

AFTN	Red de telecomunicaciones fijas aeronáuticas Aeronautical fixed telecommunication network
A/G	Comunicaciones aire/tierra Air/ground communications
AIC	Circular de información aeronáutica Aeronautical information circular
AIDC	Comunicaciones de datos entre instalaciones ATS ATS interfacility data communications
AIRMET	Información relativa a fenómenos meteorológicos en ruta que puedan afectar la seguridad de las operaciones de aeronaves a baja altura Information concerning en-route weather phenomena which may affect the safety of low-level aircraft operations
AIS	Servicio de información aeronáutica Aeronautical information service
AMCP	Grupo de expertos sobre comunicaciones móviles aeronáuticas Aeronautical mobile communications panel
AMS(R)S	Servicio móvil aeronáutico por satélite (R) [SMAS(R)] Aeronautical mobile-satellite (R) service
AMSS	Servicio móvil aeronáutico por satélite [SMAS] Aeronautical mobile-satellite service panel
AMSSP	Grupo de expertos sobre el servicio móvil aeronáutico por satélite Aeronautical mobile-satellite service panel
ANC	Carta aeronáutica 1:500 000 Aeronautical chart 1:500 000
ANCS	Carta de navegación aeronáutica - escala pequeña Aeronautical navigation chart small scale
ANP	Plan navegación aérea Air navigation plan
ANS	Servicios de navegación aérea Air navigation services
AOC	Control de las operaciones aeronáuticas Aeronautical operational control
AOC	Plano de obstáculos de aeródromo Aerodrome obstacle chart
APANPIRG	Grupo regional de planificación e implantación Asia/Pacífico Asia/Pacific planning and implementation regional group
APAPI	Indicador simplificado de trayectoria de aproximación de precisión Abbreviated precision approach path indicator
APC	Comunicaciones aeronáuticas de los pasajeros Aeronautical passenger communications
APDC	Plano de estacionamiento y atraque de aeronaves Aircraft parking/docking chart
APIRG	Grupo regional de planificación e implantación AFI AFI planning and implementation regional group
APN	Plataforma Apron
APP	Oficina de control de aproximación Approach control office
APR	Notificación automática de posición Automatic position recording
ARC	Plano de área Area chart

ARINC	Radio aeronáutico Inc. Aeronautical radio Inc.
ARNS	Servicio de radionavegación aeronáutico Aeronautical radio navigation service
ASAS	Sistema de garantía de la separación de a bordo Airborne separation assurance system
ASDE	Equipo de detección de superficie de aeropuerto Airport surface detection equipment
ASE	Error del sistema altimétrico Altimetry system error
ASECNA	Agencia para la seguridad de la navegación aérea para Africa y Madagascar Agency for the security of air navigation in Africa and Madagascar
ASM	Gestión del espacio aéreo Airspace management
A-SMGCS	Sistema de control guía de movimiento en superficie (avanzado) (Advanced) surface movement guidance and control system
ASPP	Grupo de expertos sobre planificación de los sistemas del servicio fijo aeronáutico para el intercambio de datos Aeronautical fixed service (AFS) systems planning for data interchange panel
ASR	Radar de vigilancia de aeropuerto Airport surveillance radar
ATA	Hora actual de arribo Actual time of arrival
ATAR	Grupo de estudio sobre aeronotificación automática Automatic air reporting study group
ATC	Control de tránsito aéreo Air traffic control
ATCO	Controlador de tránsito aéreo Air traffic controller
ATFM	Gestión de la afluencia del tránsito aéreo Air traffic flow management
ATIR	Informe sobre incidentes de tránsito aéreo Air traffic incident report
ATIS	Servicio automático de información del área terminal Automatic terminal information service
ATM	Gestión del tránsito aéreo Air traffic management
ATN	Red de telecomunicaciones aeronáuticas Aeronautical telecommunication network
ATS	Servicios de tránsito aéreo Air traffic services
ATSC	Comunicaciones de los servicios de tránsito aéreo Air traffic services communications
AT-VASIS	Sistema visual indicador de pendiente de aproximación simplificado en T Abbreviated T visual approach slope indicator system
AWOP	Panel de operaciones todo tiempo All weather operations panel
BORPC	Requisitos operacionales básicos y criterios de planificación Basic operational requirements and planning criteria
CAA	Administración de aviación civil Civil aviation authority
CAMR-92	Conferencia administrativa mundial de radiocomunicaciones - 1992 World administrative radiocommunications conference - 1992

CAPS	Servicio de compras de aviación civil Civil aviation purchasing service
CASITAF	Grupo de tareas para implantación CNS/ATM CNS/ATM systems implementation task force
CAT	Categoría (de aterrizaje) Category (of landing)
CATCs	Centros de instrucción de aviación civil Civil aviation training centres
CBA	Análisis de costo/beneficios Cost/benefit analysis
CBT	Entrenamiento basado en computadora Computer based training
CCIR	Comité consultivo internacional de radiocomunicaciones International radio consultative committee
CDL	Lista de desviación de configuración Configuration deviation list
CDMA	Código de división de acceso múltiple Code division multiple access
CDTI	Presentación de información de tránsito en el puesto de pilotaje Cockpit display of traffic information
CDU	Unidad de control de presentación Control display unit
CEAC	Comisión europea de aviación civil European civil aviation commission
CFIT	Impacto contra el suelo sin pérdida de control Controlled flight into terrain
CFM	Confirme o confirmo Confirm or I confirm
CFMU	Dependencia central de organización de la afluencia Centralized flow management unit
CIDIN	Red OACI común de intercambio de datos Common ICAO data interchange network
CH	Transmisión de verificación de continuidad de canal Channel-continuity-check of transmission
CLRD	Servicio de entrega de autorización de tránsito
CMDN	Conjunto de material didáctico normalizado Standard training package (STP)
CMU	Dependencia de gestión de las comunicaciones Communications management unit
CNS	Comunicaciones, navegación y vigilancia Communications, navigation and surveillance
CNS/ATM	Comunicaciones, navegación y vigilancia/gestión del tránsito aéreo Communications, navigation, and surveillance/air traffic management
COCESNA	Corporación centroamericana de servicios de navegación aérea Central american air navigation services corporation
COM/MET/OPS	Comunicaciones/meteorología/operaciones Communications/meteorology/operations
COM/OPS/95	Reunión departamental comunicaciones/ operaciones (1995) Communications/operations divisional meeting (1995)
COORD	Coordenadas Coordinates

CPDLC	Comunicaciones por enlace de datos controlador/piloto Controller/pilot data link communications
CRC	Verificación por redundancia cíclica Cyclic redundancy check
CS	Distintivo de llamadas Call sign
CVR	Registrador de la voz en el puesto de pilotaje Cockpit voice recorder
D-ATIS	Servicio automático de información terminal por enlace de datos Data link automatic terminal information service
DARP	Procedimiento dinámico de reasignación de rutas de las aeronaves Dynamic airborne route planning
DCPC	Comunicaciones directas piloto/controlador Direct controller/pilot communications
DFDR	Registrador digital de datos de vuelo Digital flight data recorder
DGNSS	GNSS diferencial Differential GNSS
DLIC	Capacidad de iniciación de enlace de datos Data link initiation capability
DLS	Servicio de enlace de datos Data link service
DLY	Diariamente Daily
DME	Equipo radiotelemétrico Distance measuring equipment
DME/P	Equipo radiotelemétrico de precisión Precision distance measuring equipment
DOC	Cobertura operacional designada Designated operational coverage
DOTS	Systema de pista dinámica de océano Dynamic ocean track system (FAA)
DTHR	Umbral de pista desplazado Displaced runway threshold
DR	A estima Dead reckoning
DSB-AM	Doble banda de amplitud modulada Double sideband-amplitude modulated
DSC	Circuito oral directo Direct speech circuit
DSP	Programa de secuencia de despegue Departure sequencing programme
D-VOLMET	Enlace de datos VOLMET Data link VOLMET
EANPG	Grupo europeo de planificación de la navegación aérea [GEPNA] European air navigation planning group
EASIE	Programa de implantación de la ATM mejorada y del Modo S en Europa Enhanced ATM and Mode S implementation in Europe
EATCHIP	Programa europeo de armonización e integración ATC European ATC harmonization and integration
E-GPWS	Sistema mejorado de alerta de proximidad a tierra Enhanced ground proximity warning system

EFIS	Exhibición de instrumentos electrónicos de vuelo (cabina de vidrio) Electronic flight instrument display (glass cockpit)
EGNOS	Servicio de superposición de navegación global europeo European global navigation overlay service
EIRP	Fuente de poder irradiado isotrópico equivalente Equivalent isotropic radiated power
ELT	Transmisor localizador de emergencia Emergency locator transmitter
EMC	Compatibilidad electromagnética Electromagnetic compatibility
ENR	En ruta En-route
ENRC	Carta en ruta Enroute chart
EPIRB	Radiofaro indicador de posición de emergencia Emergency position indicating radio beacon
ESA	Agencia espacial europea European space agency
ETG	Grupo Europeo Tripartito European Tripartite Group
ETOPS	Operaciones de aeronaves bimotores de rango extendido Extended range twin-engine aircraft operations
EUROCONTROL	Organización europea para la seguridad de la navegación aérea European organization for the safety of air navigation
EURATN	ATN europea European ATN
EURET	Transporte europeo European transport
ETA	Hora estimada de arribo Estimated time of arrival
EUR	Europa Europe
FAA	Administración federal de aviación Federal aviation administration
FANS	Comité especial sobre sistemas de navegación aérea del futuro Special committee on future air navigation systems
FANS (Fase II)	Comité especial para la supervisión y coordinación del desarrollo del sistema de navegación aérea del futuro y del planeamiento de la transición
(Phase II)	Special committee for the monitoring and co-ordination of development and transition planning for the future air navigation system
FANS-1/A	Sistema de navegación aérea del futuro (Tipo 1 o Tipo A) Future air navigation system (Type 1 or Type A)
FASID	Documento para la implantación de las instalaciones y servicios Facilities and services implementation document
FAWP	Punto notificación de aproximación final Final approach way-point
FDAU	Unidad de adquisición de datos de vuelo Flight data acquisition unit
FDE	Detección y eliminación de fallas Fault detection and exclusion
FDI	Detección y aislamiento de fallas Fault detection and isolation

FDPS	Sistema de procesamiento de datos de vuelo Flight data processing system
FDR	Grabadora de datos de vuelo Flight data recorder
FIC	Centro de información de vuelo Flight information centre
FIR	Región de información de vuelo Flight information region
FIS	Servicio de información de vuelo Flight information service
FL	Nivel de vuelo Flight level
FLAS	Sistema de asignación de nivel de vuelo Flight level allocation system
FMC	Computadora de gestión de vuelo Flight management computer
FMCS	Sistema de computadora de gestión de vuelo Flight management computer system
FMS	Sistema de gestión de vuelo Flight management system
FMSG	Grupo de estudio sobre gerenciamiento de frecuencias Frequency management study group
FMU	Dependencia de organización de la afluencia Flow management unit
FPL	Plan de vuelo Flight plan
FS	Servicio fijo Fixed service
GADS	Sistema de exhibición genérico de aeronaves Generic Aircraft display system
GAIT	Técnica de aumentación e integridad con base en tierra Ground-based augmentation and integrity technique
GASP	Plan mundial de seguridad de la aviación Global aviation safety plan
GBAS	Sistema de aumentación basado en tierra Ground-based augmentation system
GCAS	Sistema de anticolidión en tierra Ground collision avoidance system
GEO	Satélite geoestacionario Geostationary earth orbit
GEPNA	Grupo europeo de planificación de la navegación aérea European air navigation planning group
GES	Estación terrena de tierra Ground earth station
G/G	Comunicación tierra/tierra Ground/ground communication
GIC	Canal de integridad GNSS GNSS integrity channel
GLONASS	Sistema orbital mundial de navegación por satélite (Federación de Rusia) Global orbiting navigation satellite system (Russian Federation)
GMC	Carta de movimiento en la superficie Ground movement chart

GMS	Estación terrestre de monitoreo Ground monitoring station
GMU	Unidad GPS (altura) de monitoreo GPS (height) monitoring unit
GNE	Errores de navegación Gross navigational errors
GNSS	Sistema mundial de navegación por satélite Global navigation satellite system
GNSSP	Panel sobre el sistema mundial de navegación por satélite Global navigation satellite system panel
GP	Propósito general General purpose
GPS	Sistema mundial de determinación de la posición (Estados Unidos) Global positioning system
GPWS	Sistema de alerta de proximidad a tierra Ground proximity warning system
GREPECAS	Grupo regional de planificación y ejecución CAR/SAM CAR/SAM regional planning and implementation group
GUND	Ondulación geoidal Geoid undulation
HF	Altas frecuencias High frequencies
HFDL	Enlace de datos HF HF data link
HMI	Interface hombre-máquina Human-machine interface
HMU	Monitor de altura Height monitoring unit
HRPTSG	Grupo de estudio sobre planificación y entrenamiento de recursos humanos Human resource planning and training study group
HSI	Indicador horizontal de situación Horizontal situation indicator
I+D	Investigación y desarrollo Research + development [R+D]
IAC	Carta de aproximación por instrumentos Instrument approach chart
IACA	Asociación Internacional de chárteres aéreos International air carrier association
IATA	Asociación del transporte aéreo internacional International air transport association
IAOPA	Consejo internacional de asociaciones de propietarios y pilotos de aeronaves International council of aircraft owner and pilot associations
IAWP	Punto de notificación de aproximación inicial Initial approach way-point
ICC	Comunicaciones entre centros de control Inter-center communications
ICCAIA	Consejo coordinador internacional de asociaciones de industrias aeroespaciales International co-ordinating council of aerospace industries associations
ICD	Documento de control de interfaz Interface control document
ICO	Orbita circular intermedia Intermediate circular orbit

IDPyD	Investigación, desarrollo, pruebas y demostraciones Research, development, trials and demonstrations
IFALPA	Federación internacional de asociaciones de pilotos de líneas aéreas International federation of airline pilots association
IFATCA	Federación internacional de asociaciones de controladores de tránsito aéreo International federation of air traffic controllers association
IFR	Reglas de vuelo por instrumentos Instrument flight rules
IGYCAG	Grupo Mundial Informal de Acción para la Coordinación Y2K Informal Global Y2K Coordination Action Group
ILS	Sistema de aterrizaje por instrumentos Instrument landing system
IMC	Condiciones meteorológicas de vuelo por instrumentos Instrument meteorological conditions
IMI	Signo de interrogación Interrogation sign (question mark)
INMARSAT	Consorcio satelital marítimo internacional International Maritime Satellite Consortium
INS	Sistema de navegación inercial Inertial navigation system
IRS	Sistema de referencia inercial Inertial reference system
IWP	Punto de notificación de aproximación intermedia Intermediate approach way-point
ISO	Organización internacional de normalización International standardization organization
LAAS	Sistema de aumentación de área local Local area augmentation system
LADGPS	Area local diferencial - GPS Local area differential - GPS
LAHSO	Operaciones de aterrizaje y parada antes de la intersección Land and hold short operations
LAT	Latitud Latitude
LDP	Punto de decisión para el aterrizaje Landing decision point
LEO	Sistema satelital de órbita terrena baja Low earth orbit satellite system
LOA	Carta de acuerdo Letter of agreement
LONG	Longitud Longitude
LR	El último mensaje que recibí fue ... The last message received by me was ...
LRNS	Sistema de navegación de largo alcance Long range navigation system
LS	El último mensaje que envié fue ... o el último mensaje fue ... The last message sent by me was ... or last message was ...
MAHWP	En espera de punto de notificación de aproximación errada Missed approach holding way-point
MASPS	Especificaciones mínimas de performance del sistema de aeronave Minimum aircraft system performance specifications

MAWP	Punto de notificación de aproximación errada Missed approach way-point
MCDU	Unidad de presentación visual de control de funciones múltiples Multifunction control display unit
MCS	Estación de control base Master control station
MES	Estación terrena móvil Mobile earth station
MET	Servicios meteorológicos para la navegación aérea Meteorological services for air navigation
MEL	Lista de equipo mínimo Minimum equipment list
MEO	Sistema satelital de órbita terrena media Medium earth orbit satellite system
MF	Frecuencia media Medium frequency
MIDANPIRG	Grupo de planificación y ejecución de navegación aérea de Oriente Medio Middle East air navigation planning and implementation group
MIS	Falta ... (identificación de la transmisión) Missing ... (transmission identification)
MLS	Sistema de aterrizaje por microondas Microwave landing system
MMEL	Lista maestra sobre equipo mínimo Master minimum equipment list
MMI	Interface hombre/máquina Man/machine interface
MMR	Receptor multimodo Multi-mode receptor
MNPS	Especificación de performance mínima de navegación Minimum navigation performance specification
MNT	Técnica número mach Mach number technique
MOPS	Normas de performance mínima operacional (ADS) Minimum operational performance standards (ADS)
MOU	Memorándum de acuerdo Memorandum of understanding
MSA	Acuerdos sobre sistemas de gestión Management services agreements
MSAW	Aviso de altitud mínima de seguridad Minimum safety altitude warning
MSR	Mensaje ... (identificación de la transmisión) transmitido por vía indebida Message ... (transmission identification) has been misrouted
MSSR	Radar secundario de vigilancia de monoimpulso Monopulse secondary surveillance radar
MU	Unidad de gestión Management Unit
MTSAT	Satélite de transporte multifuncional Multi-functional transport satellite
MWO	Oficina de vigilancia meteorológica Meteorological watch office
NADIN	Red de intercambio de datos de las aerovías nacionales National airways data interchange network

NAM	Norte América North America
NASC	Centro nacional de sistemas AIS National AIS system centre
NAT	Atlántico Septentrional North Atlantic
NAT SPG	Grupo sobre planeamiento de sistemas Atlántico septentrional North Atlantic systems planning group
NAV	Navegación Navigation
NDB	Radiofaro no direccional Non-directional radio beacon
NGSO	Orbita no geosincrónica Non-geosynchronous orbit
NGSS	Sistema satelital para la próxima generación Next generation satellite system
NLA	Aeronaves de gran tamaño New larger airplanes
NM	Millas marinas Nautical miles
NOAA	Administración nacional oceánica y atmosférica National oceanic and atmospheric administration
NOPAC	Pacífico Septentrional North Pacific
NOTAM	Aviso a los aviadores Notice to airmen
NOZ	Zona normal de operaciones Normal operating zone
NPV	Valor actual neto Net present value
NSC	Centro de servicios de la red Network service centre
NTL	Nacional National
NTZ	Zona inviolable No transgression zone
OAC	Centro de control de área oceánica Oceanic area control centre
OACI	Organización de aviación civil internacional International civil aviation organization
OCA	Área de control oceánica Oceanic control area
OCP	Grupo de expertos sobre franqueamiento de obstáculos Obstacle clearance panel
OCS	Sistema de control oceánico Oceanic control system
OFZ	Zona libre de obstáculos Obstacle-free zone
OGN	Empiece Originate
OLDI	Intercambio directo de datos On line data interchange

OMI	Organización marítima internacional International maritime organization [IMO]
OPAS	Asistencia operacional Operational assistance
OR	Fuera de ruta Off-route
OSI	Interconexión de sistemas abiertos Open systems interconnection
OTS	Sistema organizado de derrotas Organized track system
PANS-OPS	Procedimientos para los servicios de navegación aérea - Operación de aeronaves Procedures for Air Navigation Services - Aircraft Operations
PAR	Radar de aproximación de precisión Precision approach radar
PATC	Carta topográfica para aproximaciones de precisión Precision approach terrain chart
PBI/GDP	Producto bruto interno Gross domestic product
PCL	Iluminación controlada por el piloto Pilot controlled lighting
PDC	Autorización previa a la salida Pre-departure clearance
PET	Ensayos de ingeniería en el Pacífico Pacific engineering trials
PHARE	Programa de investigación sobre la organización armónica del tránsito aéreo en EUROCONTROL Programme for harmonized ATM research in EUROCONTROL
PIB	Boletín de información previa al vuelo Pre-flight information bulletin
PIRG	Grupo regional de planificación y ejecución Planning and implementation regional group
PNUD	Programa de las naciones unidas para el desarrollo United nations development programme [UNDP]
PPI	Indicador de rendimiento y productividad Performance and productivity indicator
PPS	Servicio GPS de posicionamiento preciso GPS precise positioning service
PRF	Frecuencia repetitiva de pulso Pulse repetition frequency
PRM	Mensaje preferencial de encaminamiento Preferred route message
PSR	Radar primario de vigilancia Primary surveillance radar
PTS	Estructura de derrota polar Polar track structure
QOS	Calidad de servicio Quality-of-service
RA	Aviso de resolución (ACAS) Resolution advice (ACAS)
RAIM	Vigilancia autónoma de la integridad en el receptor Receiver autonomous integrity monitoring
RAS	Sistema de aumentación regional Regional augmentation system

RASC	Centro regional de sistemas AIS Regional AIS system centre
RCAG	Sistema a control remoto aire/tierra Remote-controlled air/ground system
RCC	Centro coordinador de salvamento Rescue coordination centre
RCP	Performance requerida de comunicación Required communication performance
RDPS	Sistema de procesamiento de datos radar Radar data processing system
RESA	Zona de seguridad de fin de pista Runway end safety area
RF	Radiofrecuencia Radio frequency
RFI	Interferencia RF RF interference
RFP	Solicitud de propuesta Request for proposal
RGCSF	Grupo de expertos sobre el examen del concepto general de separación Review of the general concept of separation panel
RGS	Estación terrena remota Remote ground station
RHC	Circuito del lado derecho Right-hand circuit
RLRS	Espaciado lateral reducido entre rutas Reduced lateral route spacing
RMI	Indicador magnético remoto Remote magnetic indicator
RNAV	Navegación de área Area Navigation
RNAV Route	Ruta de navegación de área Area navigation route
RNP	Performance requerida de navegación Required navigation performance
RNPC	Capacidad de la performance requerida de navegación Required navigation performance capacity
ROA	Rendimiento de los activos Return on assets
ROCE	Retorno del capital invertido Return on capital employed
RPI	Indicador de posición radar Radar position indicator
RSC	Subcentro de salvamento Rescue sub-centre
RSP	Performance de vigilancia requerida Required surveillance performance
RTA	Alerta de resolución de tránsito Resolution traffic alert
RTA	Hora de llegada requerida Required time of arrival
RTCA	Comisión radio técnica para la aviación Radio technical commission for aeronautics

RTSP	Performance total requerida del sistema Required total system performance
RVSM	Separación vertical mínima reducida Reduced vertical separation minima
SA	Disponibilidad selectiva Selective availability
SAM	Sud America South America
SAR	Búsqueda y salvamento Search and rescue
SARPS	Normas y métodos recomendados Standards and recommended practices
SATCOM	Comunicaciones por satélite Satellite communication
SATVOICE	Comunicaciones orales por satélite Satellite voice communication
SBAS	Sistema de aumentación basado en satélite Satellite-based augmentation system
SCRSP	Grupo de expertos sobre sistemas de vigilancia y resolución de conflictos Surveillance and conflict resolution systems panel
SELCAL	Llamada selectiva Selective calling
SG	Subgrupo Subgroup
SICASP	Grupo de expertos sobre mejoras del radar secundario de vigilancia y sistemas anticollisión Secondary surveillance radar improvement and collision avoidance system panel
SID	Salida normalizada por instrumentos Standard instrument departure
SIGWX	Pronóstico de tiempo significativo Significant weather forecast
SIRO	Operaciones simultáneas en pistas que se cruzan Simultaneous intersecting runway operations
SMA	Asesor de movimiento de superficie Surface movement advisor
SMAS	Servicio móvil aeronáutico por satélite Aeronautical mobile satellite service [AMSS]
SMAS(R)	Servicio móvil aeronáutico por satélite (R) Aeronautical mobile satellite service (R) [AMSS(R)]
SMGCS	Sistema de guía y control del movimiento en la superficie Surface movement guidance and control system
SMR	Radar de movimiento en la superficie Surface movement radar
SOP	Procedimiento estándar de operaciones Standard operating procedure
SPS	Servicio normalizado de determinación de la posición Standardized positioning system
SSB	Banda lateral única Single sided band
SSR	Radar secundario de vigilancia Secondary surveillance radar
SST	Transporte supersónico Supersonic transport

STDMA	Acceso múltiple automático por distribución en el tiempo Self-organizing time division multiple access
STP	Conjunto de material didáctico normalizado (CMDN) Standardized training package
SUA	Espacio aéreo para uso especial Special use airspace
TA	Aviso de tránsito Traffic advisory
TAF	Pronóstico de aeródromo Aerodromo forecast
TBD	A ser determinado To be determined
TC	Concepto de túnel Tunnel concept
TCAC	Centro de avisos de ciclones tropicales Tropical cyclone advisory centre
TCAS	Sistema de anticollisión de tránsito Traffic collision avoidance system
TCB	Dirección de cooperación técnica Technical cooperation bureau
TCDC	Cooperación técnica entre los países en desarrollo Technical cooperation among developing countries
TDMA	Acceso múltiple por división del tiempo Time division multiple access
TDWR	Radar meteorológico doppler de terminal Terminal doppler weather radar
TIBA	Radiodifusión en vuelo de información sobre el tránsito aéreo Traffic information broadcast by aircraft
TLS	Nivel óptimo de seguridad Target level of safety
TMA	Area de control terminal Terminal management area
TMI	Identificación de trayectoria de mensaje Track message identification
TNAV	Tiempo de navegación (RNAV) Time of navigation (RNAV)
T-VASIS	Sistema visual indicador de pendiente de aproximación en T T visual approach slope indicator system
TWDL	Enlace de datos de dos vías Two-way data link
TWP	Programa técnico Technical work programme
TWR	Torre de control Tower
UAV	Valores anuales uniformes Uniform annual values
UHF	Frecuencia ultra alta Ultra high frequency
UIT	Unión internacional de telecomunicaciones International telecommunications union [ITU]
UL	Enlace ascendente Uplink

UM	Mensaje de enlace ascendente Uplink message
USOAP	Programa universal de auditoría de la vigilancia de la seguridad operacional Universal safety oversight audit programme
UTC	Tiempo universal coordinado Universal time coordinated
VAAC	Centro de avisos de cenizas volcánicas Volcanic ash advisory centre
VAC	Carta de aproximación visual Visual approach chart
VAP	Panel de Ayudas visuales Visual aids panel
VASIS	Sistemas visuales indicadores de pendiente de aproximación Visual approach slope indicator systems
VC	Circuito virtual Virtual circuit
VCCS	Sistema de control de comunicación de voz Voice communication control system
VDEV	Desviación vertical Vertical deviation
VDL	Enlace de datos VHF VHF data link
VDL-4	Enlace de datos VHF Modo 4 VHF data link Mode 4
VDR	Radio de datos VHF VHF data radio
VFR	Reglas de vuelo visual Visual flight rules
VHF	Muy alta frecuencia Very high frequency
VLF	Muy baja frecuencia Very low frequency
VMC	Condiciones meteorológicas de vuelo visual Visual meteorological conditions
VOLMET	Información meteorológica para aeronaves en vuelo Meteorological information for aircraft in flight
VOR	Radiofaro omnidireccional VHF VHF omnidirectional radio range
VSM	Mínima de separación vertical Vertical separation minimum
WAAS	Sistema de aumentación de área amplia Wide area augmentation system
WAC	Carta aeronáutica mundial - OACI 1:1 000 000 World Aeronautical Chart - ICAO 1:000 000
WADGPS	Diferencial de área amplia - GPS Wide area differential - GPS
WAFC	Centro mundial de pronósticos de área World area forecast centre
WAFS	Sistema mundial de pronósticos de área World area forecast system
WATRS	Sistema de rutas del Atlántico Occidental West atlantic route system

WGS-84	Sistema geodésico mundial - 1984 World geodetic system - 1984
WMS	Estación principal de área amplia Wide area master station
WRC	Conferencia mundial de radiocomunicaciones World radio communications conference
WRS	Estación de referencia sobre aumentación de área amplia Wide area augmentation reference station
WWW	Red mundial World wide web