INTERNATIONAL CIVIL AVIATION ORGANIZATION

SOUTH AMERICAN REGIONAL OFFICE

REPORT OF THE SAT/9 MEETING (SAT/9)

(Lima Peru, 6 to 10 November 2000)

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History of the meeting

ii-1 Introduction

ii-1.1 The Ninth informal meeting for the improvement of air traffic services over the South Atlantic (SAT/9 Meeting) was held pursuant to AFI/7 RAN Meeting Recommendation 5/11 and CAR/SAM/3 RAN Meeting Recommendation 5/30 in Lima, Peru from 6 – 10 November 2000. The meeting was hosted by Peru and was held at the Centro de Entrenamiento de CORPAC, S.A., (Corporación Peruana de Aeropuertos y Aviación Comercial, S.A.).

ii-1.2 The meeting was officially opened by Mr. Carlos Antoniolli, Director of Air Safety, Peruvian aeronautical authority representing the General Director of Air Transport, Peru, who welcomed the participants and wished them fruitful deliberations and a nice stay in Peru. Mr. Felix Granthon, the General Manager of CORPAC, Peru also addressed the meeting and extended his warm welcome to the delegates.

ii-1.3 The Regional Director of the ICAO South American Office, Mr. Paulo Imre Hegedus, in his welcome address emphasized the importance of Informal South Atlantic Meetings, in particular in the context of the implementation of the CNS/ATM systems. The speaker pointed out that other ICAO Regions are awaiting the outcome of this meeting, which has paved the way for inter-regional co-ordination and co-operation for the smooth and evolutionary implementation of the different elements of the ICAO CNS/ATM system. Mr José Emanuel Rodriguez, from the Air Navigation Division of ASA, from Cape Verde was unanimously elected as Chairman of the meeting, and Brazil was elected as Vice-Chairman.

ii-1.4 Mr. Dhiraj Ramdoyal, Regional Officer ATM, from the ICAO Western and Central African Office was the Secretary of the meeting and was assisted by Mr. Carlos Stehli Martinez and Mr. Jorge Fernandez Demarco CNS and ATM Regional Officers from the ICAO, Lima Office and Mr. Gustavo De León, RO/ATM Officer from the ICAO Mexico Office.

ii-2 Attendance

ii-2.1 The meeting was attended by 46 participants from 10 contracting States (Argentina, Brazil, Cape Verde, France, Peru, Senegal, South Africa, Spain, United States and Uruguay) and 3 international organizations (the Agency for the Safety of Aerial Navigation in Africa and Madagascar (ASECNA), the International Air Transport Association (IATA), and Aeronautical Radio Incorporated (ARINC).

ii-2.2 The List of participants as well as a List of contacts are shown at **Appendix D.**

ii-3 **Working languages**

ii-3.1 The meeting was conducted in English and Spanish languages and simultaneous interpretation services were provided by 2 freelance interpreters.

Agenda

The meeting adopted at its opening session the following agenda:

Agenda Item 1 : Analysis of Air Traffic Data over the South Atlantic

Agenda Item 2 : Status report on safety assessment in the EUR/SAM corridor

Agenda Item 3 : ATM related aspects within areas of routings AR-1/HA1 and AR-2/HA8

Agenda Item 4 : Review of the Report of the SAT/8 Task Force Meeting

Agenda Item 5 : Status of amendment proposals for the implementation of RVSM and RNP 10 operations in the EUR/SAM corridor

Agenda Item 6 : Communications
- AFTN
- ATS/DS
- CAFSAT and other related COM

Agenda Item 7 : Any other business

LIST OF CONCLUSIONS

Conclusion 1/1: Air traffic statistical data in the EUR/SAM corridor

That States concerned continue to provide the necessary air traffic statistical data on a regular basis to Spain, in accordance with SAT/8 conclusion 1/1 and the address of the South Atlantic Monitoring Agency (SATMA) could also be used for that purpose.

Conclusion 2/1: Submission of statistical data

That:

a) States and Organizations concerned submit to the South Atlantic Monitoring Agency (SATMA) the necessary statistical data to assist in the timely completion of the safety analysis; and

b) The navigation deviation investigation form at Atached A to the report on this agenda item be used in the collection of the data.

Conclusion 3/1: Processing of flight plans

That:

a) Centres concerned try to promote the utilization of repetitive flight plans (RPLs);

Note: All ways and means should be explored in order to improve the communications deficiencies. Otherwise, the expected benefits would still not be achieved as updated information on delayed/ cancelled flights would, most of the time, not reach its destination

b) Brazil, Canarias, Cape Verde and Senegal record the number of flight plans which are not received from period 1 – 7 December 2000 and forward the information to the South Atlantic Monitoring Agency (SATMA) including Euro-Control and IATA for pertinent follow-up action as necessary;

c) Brazil performs a survey on the AFTN links used in the transmission of flight plans in the EUR/SAM corridor;

d) IATA requests operators flying within the EUR/SAM corridor between period 1 – 7 December 2000 to resubmit via SITA network a copy of the flight plans to the following address: LPAYTXH (*primary*) or otherwise, to LPAFOYA (*secondary*) and to indicate the AFTN address to which the flight plans were originally forwarded; and

e) Euro-Control be again apprised of the problem.

Conclusion 3/2: Creation of an additional ATS route West of UN741

That the proposal for the creation of an additional route West of UN741 be discussed within the framework of the SAT Task Force Meeting which has been established for the EUR/SAM corridor.

Conclusion 3/3: Creation of an ATS route between Antigua – Ascension Island – South Africa

That:

a) South Africa and the United States will co-ordinate a proposal for amendment of the CAR/SAM and AFI Plans for the creation of an ATS route between Antigua – Ascension Island – South Africa;

b) The need for proper ATS co-ordination between the ATS units of Ascension Island and Brazil including the submission of flight plans and air to ground communications of flights to/from Ascension Island with the appropriate ATS units is a pre-requisite prior to the implementation of the above route; and

c) The appropriate ICAO Regional Offices concerned will follow-up the matter.

Conclusion 3/4: Flights to/from Ascension Island and Malvinas/Falklands

That:

a) the ATS units of Ascension Island and Malvinas/Falklands ensure that flight plans be transmitted to all ATS units concerned in a timely manner;

b) Pilots intending to operate to/from Ascension Island and Malvinas/Falklands ensure that proper air to ground communication is established with the appropriate ATS units; and

c) The appropriate ICAO Regional Offices concerned will follow-up the matter.

Conclusion 4/1: Follow-up action on SAT/8 TF 1 Conclusions

That States and Organizations concerned be urged to take appropriate action on the conclusions emanating from SAT/8TF1 meeting as necessary.

Conclusion 5/1: Amendments to Doc 7030 for the implementation of RNP10, in-flight contingencies and RVSM in the EUR/SAM corridor.

That:

a) the Secretariat ensures that the procedures for the amendment of the Regional Supplementary Procedures Doc 7030 for the introduction of RNP10, in-flight contingencies and RVSM be processed in a timely manner so that the planned date of implementation is not delayed;

b) the Secretariat ensures that the proposed amendments to the drafts be considered; and

c) Editorial amendments to the Air Navigation Plan be carried out for the new route network

Conclusion 6/1: Shortcomings concerning AFS communication requirements between South Africa and Argentina, Brazil and Uruguay

South Africa will study the connection alternatives contained in Appendix A to this part of the report for the improvements in the AFS within area of routing AR-2, and will submit its decision to ICAO before the forthcoming SAT Task Force meeting, scheduled to be held in the second quarter of 2001, subject to technical requirement specifications being met.

Conclusion 6/2: Air-to-air communication channel.

States be invited to promulgate the use of air-to-air frequency 123.45 Mhz in accordance with the provisions of Annex 10, Vol. V, Chapter 4, par. 4.1.3.2.

Conclusion 6/3: Improvements of the HF communications

That:

a) as an urgent matter, Argentina and Brazil should take the necessary measures, including the review of the communication procedures, to improve the current situation of the HF communication coverage in the Oceanic areas of the Ezeiza and Brasilia FIRs;

b) South to parallel 20°S, IATA be invited to carry out a HF communication survey during the second and third weeks of December 2000, and the test results be submitted to the concerned States and ICAO Regional Offices;

c) The ICAO Secretariat prepares documentation for the revision of the CAR/SAM and AFI Air Navigation Plans by GREPECAS and APIRG concerning the recommendations for allocation of HF network designators for the aeronautical stations in the concerned parts of the AFI, SAM and SAT WMARAs; and

d) In support of c) above, IATA and IFALPA, using the standard methodology approved by the ICAO Council continue the reporting of deficiencies/shortcomings to the concerned Regional Planning Groups and ICAO Regional Office

Conclusion 6/4: SATCOM voice communications

That Argentina and Brazil consider the implementation at the ACCs of Brasilia and Ezeiza including in the AIP the corresponding number, a telephone set connected to the PSTN with automatic voice recording in order to receive voice SATCOM calls from the aircraft in case that no HF communication be established.

Conclusion 6/5: Technical Working Group established by the SAT/9 Meeting

That, as part of the SAT meetings mechanism, a Technical Working Group be established to study issues related with the planning and implementation of CNS/ATM systems in the EUR/SAM corridor, according to the Terms of Reference, Work Programme and Composition indicated in Appendix A-2 of the Report.

Conclusion 7/1: SAT/9 Task Force meeting for homogeneous areas AR-1/HA-1

That The SAT/9 Task Force Meeting will be held in the second week of February and will be hosted by Spain. The Terms of Reference, Work Programme and Composition are at Appendix A-1 to the Report.
Note: The system development plan and the CNS/ATM implementation plan for area of routing AR-1/HA1 is also attached

Conclusion 7/2: SAT/9 Technical Working Group Meeting (TWG)

That The SAT TWG meeting with be held just prior to the SAT/9 TF meeting and will be hosted by Spain. The Terms of reference, Work Programme and Composition of the SAT TWG are at Appendix A-2 to the Report.

Conclusion 7/3: SAT/9 Task Force Meeting for the homogeneous areas AR-2/HA8

That the SAT Task Force for homogeneous areas AR-2/HA8 will be held in the second quarter of 2001 at a location to be coordinated by the ICAO Regional Offices concerned. The Terms of Reference, Work Programme and composition are indicated at Appendix A-3 to the Report.
Note the *CNS/ATM implementation plan for area of routing AR-2/HA8 is also attached.*

Conclusion 7/4: SAT/10 Meeting

That the SAT/10 meeting will be hosted by Senegal and will be convened in the month of November 2001.

Conclusion 7/5: Establishment of a Web page for the EUR/SAM corridor Monitoring Agency (SATMA)

That SATMA be the official Web page site of the web page.

Agenda Item 1: Analysis of Air Traffic Data over the South Atlantic

1.1 The meeting noted with appreciation the air traffic data collection and analysis carried out by Spain and urged States and organizations concerned to assist in providing all necessary information in accordance with the methodology established by SAT/8 Conclusions 1/1 b) and c).

1.2 The meeting noted the analysis of the weekly survey of traffic data carried out for every quarter of the year 2000 and was appraised of the trend in the traffic growth as compared to previous years. The results of the analysis are summarized as follows:

a) The occupancy on ATS route UN857 (UA32) represents 46.3% of the traffic flow and traffic on UN741(UR 1) and UN 866 (UB602) represent 35.1% and 18.6% respectively.

b) The percentage of preferred flight levels were as follows:

Above FL370:	5%
FL370 :	29%
FL350 :	35%
FL330 :	18.5%
FL310 :	10%
Lower than FL310:	1.5%

c) non-preferred flight levels including deviation of traffic for optimum flight levels was about 16%.

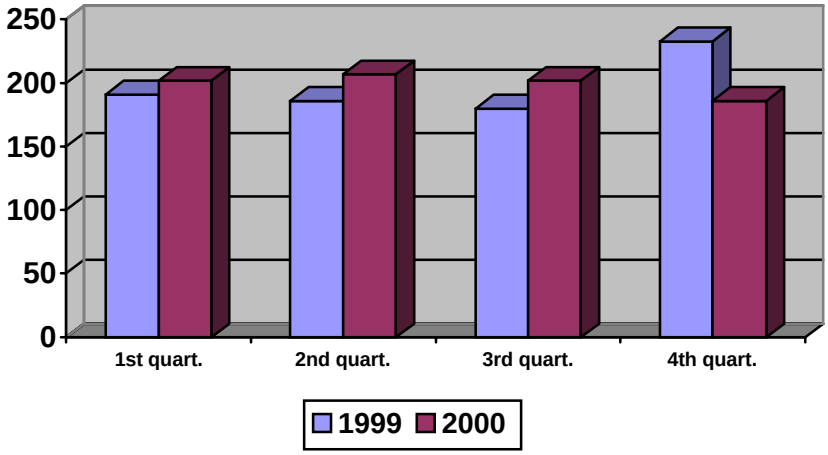
d) The traffic growth 1999-2000 is only 4.2% and indicates a lull as compared to previous years. The comparative statistics of 1999/2000 are shown at **Appendix A** to this part of the Report. However the traffic forecast carried out by IATA with projections up to year 2012 indicates a steady growth of over 8% indicates a steady increase of over 10% per year (See **Appendix B** to this part of the Report).

1.3 Based on the foregoing, the meeting concluded that:

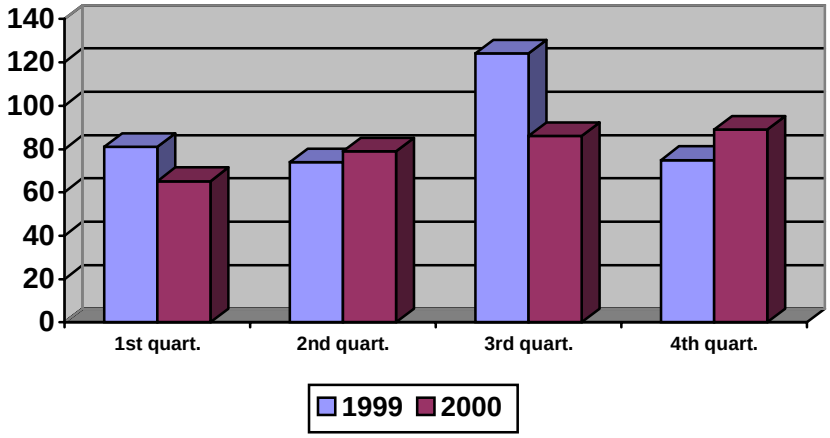
Conclusion 1/1: Air traffic statistical data in the EUR/SAM corridor

That States concerned continue to provide the necessary air traffic statistical data on a regular basis to Spain, in accordance with SAT/8 conclusion 1/1 and the address of the South Atlantic Monitoring Agency (SATMA) could also be used for that purpose.

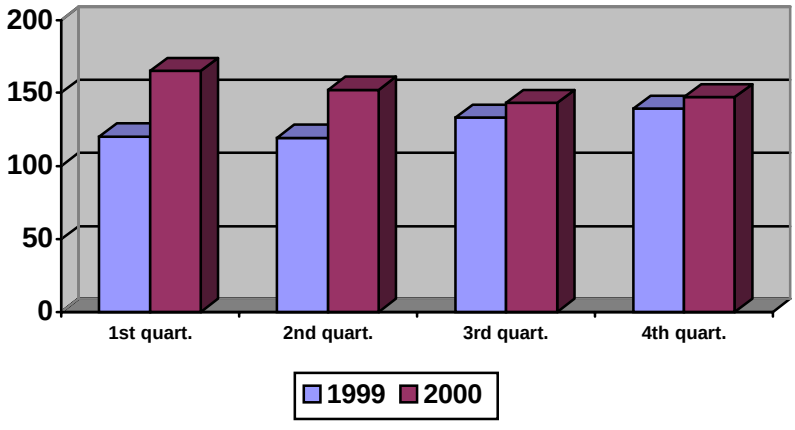
GADUN - UN857 (UA-32)



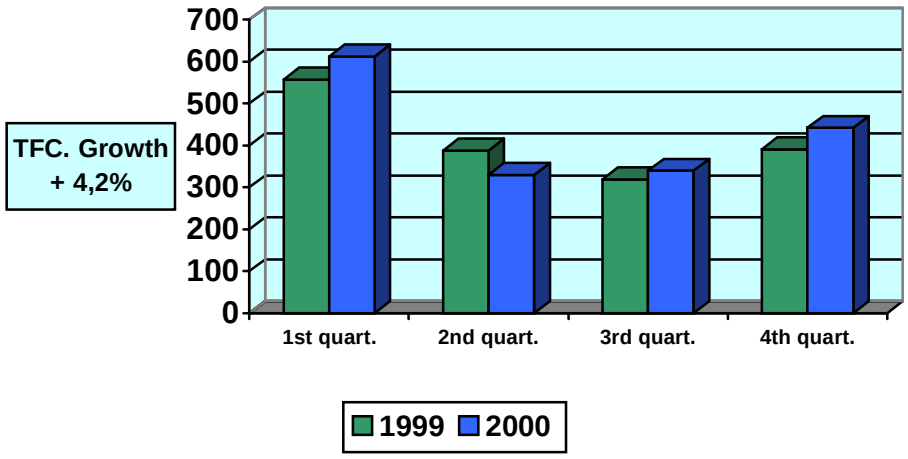
VORAS - UN866 (UB-602)



EDUMO - UN741 (UR-1)

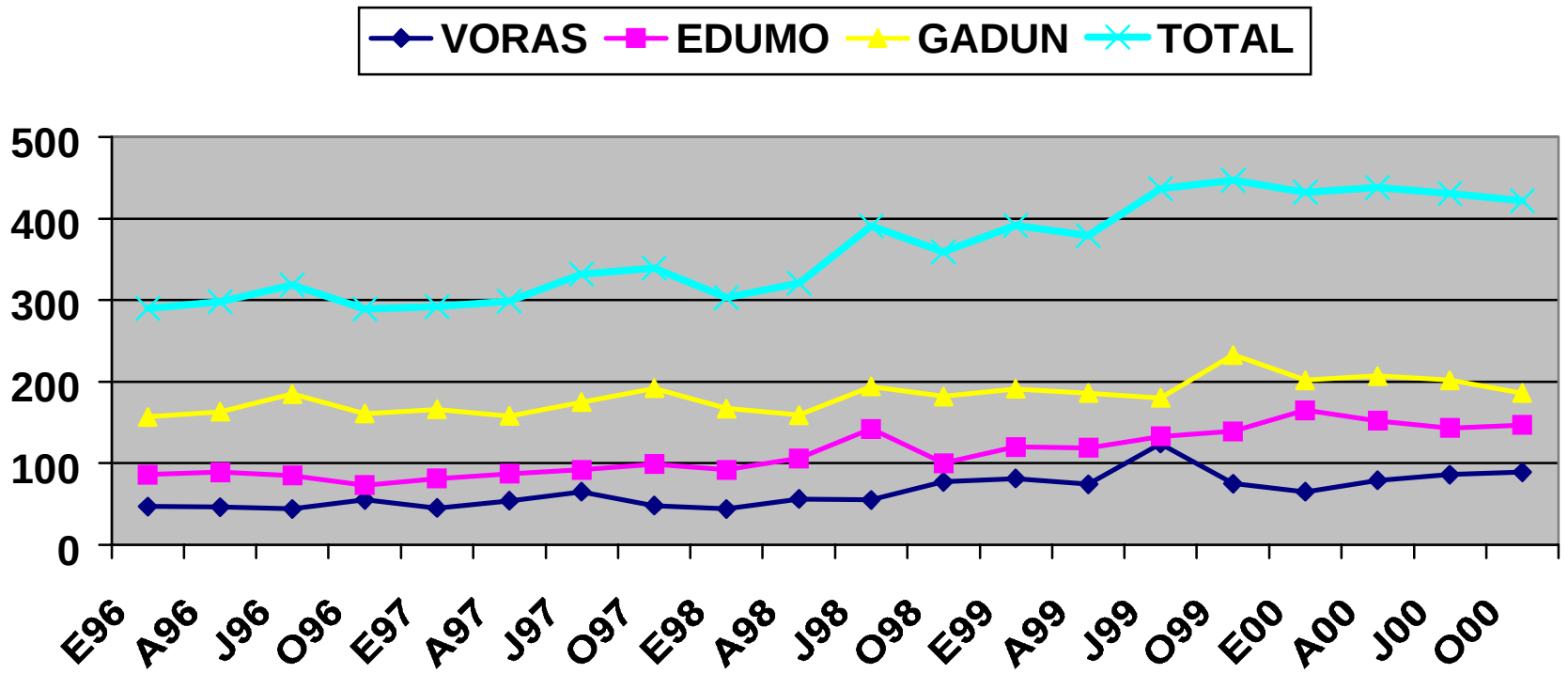


TOTAL 1999/2000



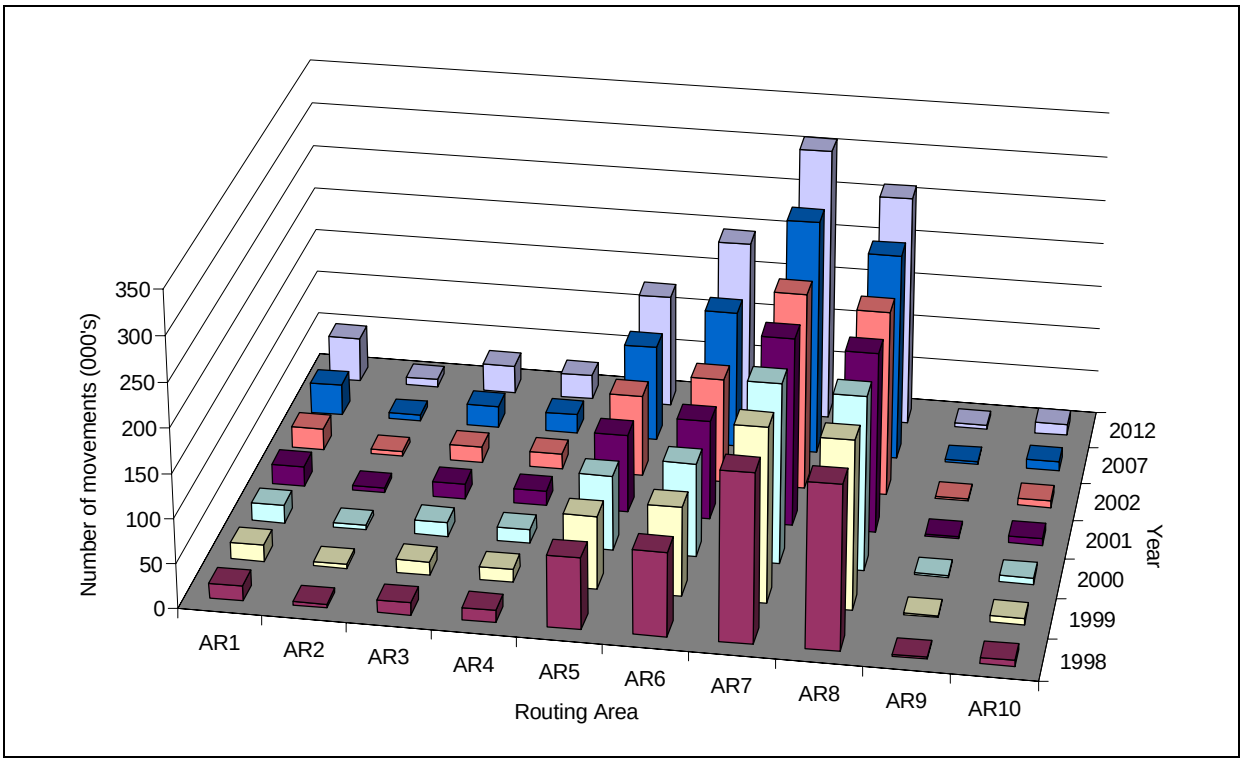
	CANARIAS	OVERFLIGHTS	TFC.	GROWTH	
	2000	1999	% var99/00	% var 98/99	% var 97/98
Month	FLIGHTS	FLIGHTS	99/00	98/99	97/98
JAN	2370	2207	7,4	18,7	8,5
FEB	2114	2041	3,6	21,5	7,8
MAR	2178	2158	0,9	13,2	8,4
APR	2253	2090	7,8	15,2	10,7
MAY	2369	2080	13,9	7,7	14,4
JUN	2132	1913	11,4	-1,8	19,3
JUL	2272	2337	-2,8	10,9	15,4
AUG	2249	2313	-2,8	7,8	18,6
SEP	2202	2262	-2,7	15,1	13,3
OCT		2356		20,9	11,4
NOV		2298		15	15
DEC		2456		14,6	13,1
TOTAL	20139	26511	3,8	13	13

SAT STATISTICS - TRAFFIC GROWTH 1966/2000 (1st week of every



The Chart summarises the forecast number of movements within each route area, through to 2012 *(carried out by IATA)*.

Movements Forecast by Homogeneous Routing Area



Scheduled Regional Results

AR1 Europe – South America

AR	1997	1998	1999	2000	2001	2002	2007	2012
AR1	15,718	17,100	18,557	20,298	22,330	24,469	35,200	50,572
AR1		8.8%	8.5%	9.4%	10.0%	9.6%	7.5%	7.5%

Agenda Item 2: Status report on safety assessments in the EUR/SAM corridor

2.1 Under this Agenda Item the meeting was informed by Spain, the monitoring agency established for ensuring the safe implementation of RNP 10 in a 50 NM lateral spacing environment and RVSM in the EUR/SAM corridor, that a contract has been signed with ARINC to carry out a safety assessment to ensure that the all the requirements are met for the safe implementation of RNP 10 and RVSM.

2.2 The meeting noted that the risk analysis evaluation process will be in accordance with the guidance material provided by ICAO and will take into account experiences of other ICAO Regions to ensure that all parameters have been addressed when carrying out the safety assessment. The meeting was also apprised of the methodology to be used in carrying out the safety risk assessment. It was agreed that although the lateral spacing between the routes are more than 50 NM, a conservative approach will be adopted and therefore a 50 NM spacing will be used.

2.3 The meeting was informed that in accordance with the contract, the results of the evaluation process should be available by 1 January 2001 The need for the co-operation of all States and organizations concerned in providing necessary data was stressed. Based on the foregoing the meeting concluded that:

Conclusion 2/1: Submission of statistical data

That:

a) States and Organizations concerned submit to the South Atlantic Monitoring Agency (SATMA) the necessary statistical data to assist in the timely completion of the safety analysis; and

b) The navigational deviation investigation form at attached A to the report on this agenda item be used in the collection of the data.

2.4 The meeting was ensured that the safety assessment will take into account the projected traffic growth in the EUR/SAM corridor for the next 10 years and will also give due considerations to crossing track operations. It was agreed that although the statistical data provided by Spain indicates a lull in the traffic growth since 1999, the assessment should instead take into account an annual increase of 8%(as per the projections made by IATA).

2.5 Spain will officially promulgate the SATMA by an AIC.

Send to SATMA
Fax: +34 928 577052
E-Mail: satma@aena.es

NAVIGATION DEVIATION INVESTIGATION FORM				
Type of Report: PILOT – Flight CONTROLLER – ATC Unit				
Date/Time (UTC):	Type of Error: LATERAL Type (A to G) (*) VERTICAL Type (A to O)			
Causes: WEATHER (See 2-G) OTHERS (Specify)				
Conflict Alert Systems:				
DETAILS OF AIRCRAFT	**First Aircraft**		**Second Aircraft (for vertical)**	
Aircraft Identification:				
Name of Owner/Operator:				
Aircraft Type:				
Departure Point:				
Destination:				
Route Segment:				
Flight Level:	Cleared	Actual	Cleared	Actual
Cleared Track:				
Extent of deviation - magnitude and direction: (NM for lateral; feet for vertical)				
Amount of time at incorrect Flight Level/Track:				
Position where deviation was observed: (BRG/DIST from fixed point or LAT/LONG)				
Action Taken by ATC/Pilot:				
Other comments:				

(*) See deviation classification

EUR/SAM CORRIDOR

NAVIGATION DEVIATION INVESTIGATION FORM

- The ATCO/Pilot should fill as many items as possible.
- Additional data can be attached.

- The notification of any deviation (vertical or lateral) has to be classified, when possible, according to the following types:

1.- For Large Height Deviations (vertical deviation)

A – Contingency action due to engine fault
B - Contingency action due to pressurisation failure
C - Contingency action due to OTHER CAUSE
D – Failure to climb/descend as cleared
E – Climb/descend without ATC clearance
F – Entry airspace at an incorrect level
G – ATC FL re-clearance resulting in loss of lateral or longitudinal separation.
H – Deviation due to TCAS
I – Aircraft unable to maintain level
O – Other

2.- For lateral deviations

A – Committed by aircraft not certified for operation in the RNP airspace
B – ATC system loop error
C1 - Equipment control error including inadvertent waypoint error
C2 – Waypoint insertion error due to the correct entry of incorrect position
D – Other with failure notified to ATC in time for action
E - Other with failure notified to ATC too late for action
F - Other with failure notified/received by ATC
G - Lateral deviations due to weather when unable to obtain prior ATC clearance

Note: That there are data that have to be notified by the pilot.

Remark: The EUR/SAM corridor includes the FIR/UIRs: Recife (Atlantic), Dakar Oceanic Sal Oceanic and Canarias.

Agenda Item 3: ATM related issues within AR1/HA1 and AR2/HA8

3.1 Processing of flight plans

3.1.1 Under this agenda item the meeting noted with concern that a significant number of flight plans are still not received for traffic operating within the EUR/SAM corridor. It was pointed out that this matter was addressed by the SAT/8 Task Force meeting and was the subject of conclusion 4/1 which stated that "the European and North Atlantic Office (EUR/NAT) Office draws the attention of Eurocontrol to the significant number of flight plans which are not being received at the level of Casablanca, Sal and Recife ACCs and explores ways and means of identifying the problem".

3.1.2 It was noted that to date the situation is still far from satisfactory. The meeting was of the view that the following possibilities should be explored in order to determine the real cause(s) of the problem:

- the reliability of the Rio-Dakar AFTN circuits;
- the reliability of the Brasilia-Madrid AFTN circuits ;
- the procedures for the submission of flight plans within Euro-Control through the Initial Flight plan Processing system (IFPS) Centre in Brussels;
- the addressing system being used in particular at the level of non automated centres;
- human errors (incorrect address, different call signs being used for the same flight, etc…)

3.1.3 In view of the foregoing the meeting formulated the following conclusions:

Conclusion 3/1: Processing of flight plans

That:

a) Centres concerned try to promote the utilization of repetitive flight plans (RPLs)

Note: All ways and means should be explored in order to improve the communications deficiencies. Otherwise, the expected benefits would still not be achieved as updated information on delayed/ cancelled flights would, most of the time, not reach its destination.

b) Brazil, Canarias, Cape Verde and Senegal record the number of flight plans which are not received from period 1 – 7 December 2000 and forward the information to the South Atlantic Monitoring Agency (SATMA) including Euro-Control and IATA for pertinent follow-up action as necessary.

c) Brazil performs a survey on the AFTN links used in the transmission of flight plans in the EUR/SAM corridor;

d) IATA requests operators flying within the EUR/SAM corridor between period 1 – 7 December 2000 to resubmit via SITA network a copy of the flight plans to the following address: LPAYTXH (*primary*) or otherwise, to LPAFOYA (*secondary*) and to indicate the AFTN address to which the flight plans were originally forwarded; and

e) Euro-Control be again apprised of the problem.

3.2 Co-ordination between Argentina, Brazil, South Africa and Uruguay

3.2.1 As a follow-up to conclusions 3/5, 3/6 and 3/8 of the SAT/6 meeting and Conclusion 6/1 of the SAT/8 meeting, an Ad Hoc Committee was created to address the following issues:

a) Review of operational letters of agreement between Johannesburg ACC/Ezeiza ACC, Johannesburg ACC/Comodoro Rivadavia ACC, Johannesburg ACC/Brasilia ACC, Johannesburg ACC/Montevideo ACC.

b) Review of the communications, navigation and surveillance aspects in the South Atlantic (AR 2/AH8).

c) Review of the search and rescue service provisions.

3.2.2 The meeting reviewed the report of the Ad-Hoc Committee and noted that:

a) operational letters of agreements (LOAs) between Johannesburg ACC and Brasilia, Ezeiza and Comodoro Rivadavia ACCs were reviewed and signed . The LOAs, will be published on 22 March 2001 and will become effective on 17 May 2001;

b) operational letter of agreement between Johannesburg ACC and Montevideo ACC was reviewed. However, due to the fact that the airspace of Oceanic Montevideo

Oriental has been delegated to Ezeiza ACC, it was agreed that the LOA will be signed at an appropriate opportunity.

c) on 14 and 15 November 2000, a frame agreement for the coordination of maritime and aeronautical search and rescue services in the Johannesburg Oceanic FIR and Ezeiza/Comodoro Rivadavia FIRs will be discussed in Buenos Aires, Argentina, between the Governments of Argentina and South Africa.

3.3 Creation of another route west of the proposed route network in the EUR/SAM corridor

3.3.1 The meeting noted the proposal by Spain for the creation of an additional ATS route West of UN741. It was pointed out that the implementation of this route will enhance airspace capacity in the area and will alleviate problems with users being able to fly at their preferred flight levels allocations on UN741. It was agreed that this matter be discussed at a later date or within the framework of the SAT Task Force Meeting for the EUR/SAM corridor. The need to consider the creation of a random area in that portion of the airspace was also emphasized.

3.3.2 Based on the foregoing the meeting concluded that:

Conclusion 3/2: Creation of an additional ATS route West of UN741

That the proposal for the creation of an additional route West of UN741 be discussed within the framework of the SAT Task Force Meeting which has been established for the EUR/SAM corridor.

3.4 Limited implementation of RVSM along ATS route UN741

3.4.1 The meeting recalled the agreement reached at the Madrid Task Force meeting for a limited implementation of RVSM between FL 330 and FL 370 along UN741 as from 19 April 2001*(tentative date)*. It was explained that the rationale for this implementation is mainly for training purposes. The go/no go decision will be taken by the next Task Force meeting to be held in February 2001. It was however recognized that implementation will be subject to the conditions prescribed in the AICs which have been published by the States concerned (Appendices D and E of the Madrid Task Force meeting refer).

3.4.2 **Training of ATS personnel for the implementation of RVSM**

3.4.2.1 The meeting noted with appreciation the offer by Spain to give simulator assisted training to air traffic services personnel of other ACCs for the provision of RVSM within the EUR/SAM corridor.

3.4.2.2 It was agreed that a training programme be established for the limited application of RVSM along UN741 and in particular, for the elaboration of procedures in the transition areas.

3.5 Creation of an ATS route between Antigua – Ascension Island – South Africa and related ATS problems

3.5.1 United States proposed the creation of an ATS route between Antigua- Ascension Island - South Africa. It was pointed out that the creation of this route with fixed entry and exit points within the EUR/SAM corridor will enhance safety. The rationale for this route is mainly for military and humanitarian flights by the United States military. However, it was explained that it could be harmonized with the proposed additional ATS routes by South Africa.

3.5.2 While discussing the above proposal, the need for proper ATS co-ordination between Ascension Island and Brazilian ATS units was emphasized. The meeting noted with concern the lack of flight plans and reliable air to ground communications of military flight to/from Ascension Islands was the subject of many ATS incidents.

3.5.3 The meeting also noted the same concerns expressed by Argentina in relation to lack of flight plans and reliable air- to-ground communications for flights to/from Ascension Island and Malvinas/Falkland Islands.

3.5.4 Based on the foregoing, the meeting concluded that:

Conclusion 3/3: Creation of an ATS route between Antigua – Ascension Island – South Africa

That:

a) South Africa and the United States will co-ordinate a proposal for amendment of the CAR/SAM and AFI Plans for the creation of an ATS route between Antigua – Ascension Island – South Africa;

b) The need for proper ATS co-ordination between the ATS units of Ascension Island and Brazil including the submission of flight plans and air to ground communications of flights to/from Ascension Island with the appropriate ATS units is a pre-requisite prior to the implementation of the above route; and

c) The appropriate ICAO Regional Offices concerned will follow-up the matter.

Conclusion 3/4: Flights to/from Ascension Island and Malvinas/Falklands

That:

a) the ATS units of Ascension Island and Malvinas/Falklands ensure that flight plans be transmitted to all ATS units concerned in a timely manner;

b) Pilots intending to operate to/from Ascension Island and Malvinas/Falklands ensure that proper air to ground communication is established with the appropriate ATS units; and

c) The appropriate ICAO Regional Offices concerned will follow-up the matter.

3.6 Proposal for the creation of two ATS routes from Atlanta to Cape Town and Johannesburg respectively

3.6.1 The proposal for the creation of ATS routes between Atlanta to Johannesburg and Cape Town by South Africa will be harmonized with the proposal by the United States for the creation of an ATS route between Antigua –Ascension Island and South Africa. This proposal will also be addressed within the framework of the SATTF for the AR2/HA8 homogeneous areas (Conclusion 3/3a) refer).

3.7 Creation of a random area within homogeneous areas AR-2/HA8

3.7.1 South Africa also presented the meeting with a proposal to initiate studies related to the establishment of an random routes area in the South Atlantic (AR 2/AH 8). It was agreed that this matter be discussed within the framework of the proposed SAT Task Force for AR2/HA8. The Terms of Reference, Work Programme and Composition of the Task Force are indicated at Appendix A-2 of the Report.

Agenda Item 4: Review of the Report of the SAT Task Force meeting

4.1 Under this agenda item the meeting was apprised of the outcome on the SAT/8 Task Force meeting which was convened in Madrid, Spain from 22 – 26 May 2000 pursuant to SAT/8 Conclusion 2/5b).

4.2 It was noted that in accordance with its Terms of Reference, the meeting completed its mandate and formulated 15 conclusions and action taken on these conclusions is summarized as follows.:

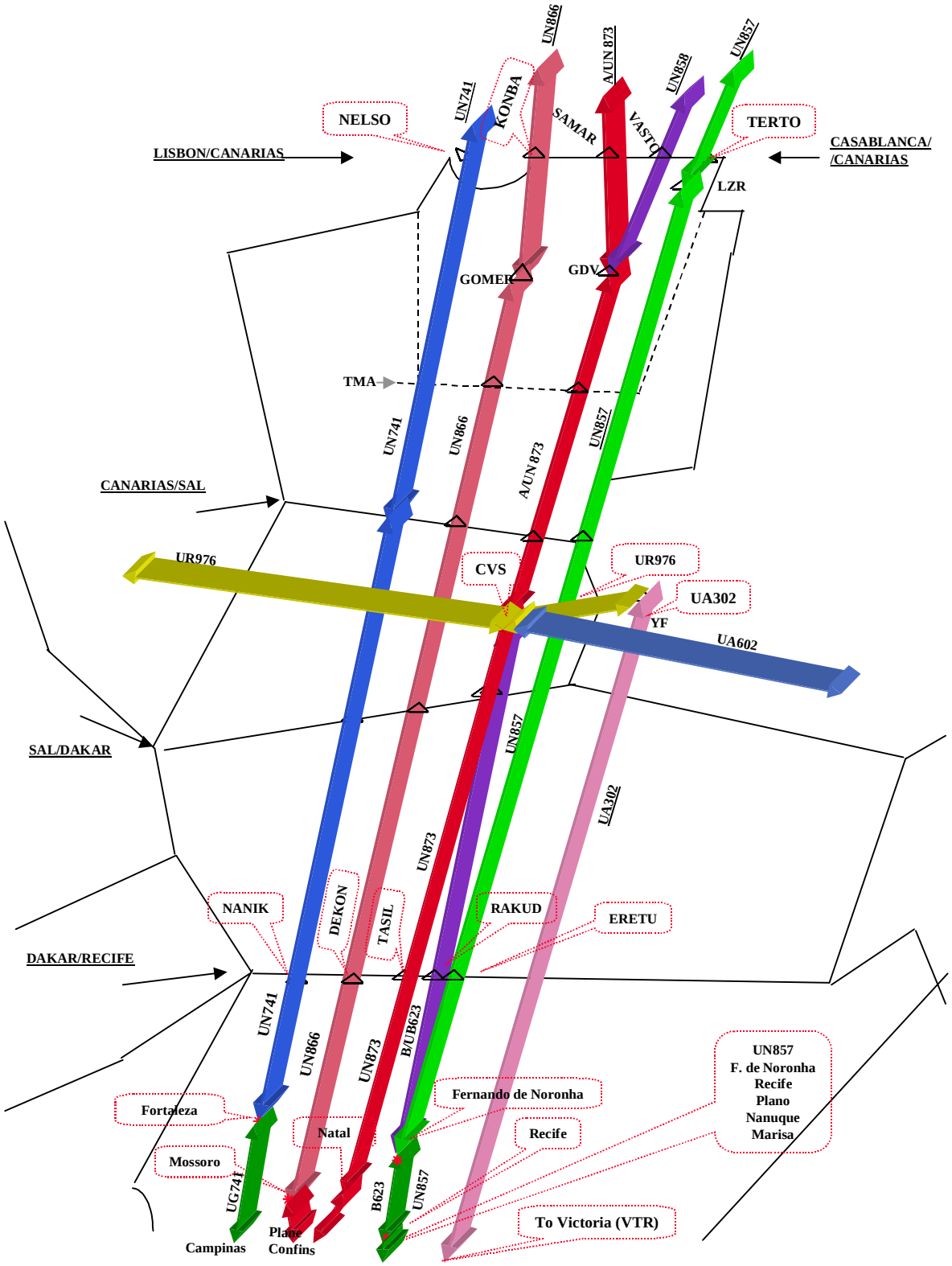
Conclusions	Title	Action Taken	Remarks/Responsibility
1/1	Safety assessment	ongoing	To be completed by 1 January 2001/SATMA, Spain
1/2	Air Traffic Statistical Data in the EUR/ SAM corridor	ongoing	States
2/1	EUR/SAM corridor route network	ongoing	Secretariat/ States. The new EUR/SAM route network is shown in the **Appendix** to this part of the Report
2/2	Civil/Military Co-ordination	ongoing	Spain
2/3	Amendment to Regional SUPPs	ongoing	Secretariat/ finalized by HQ-to be sent to states and Organizations by first week of December 2000
2/4	Creation of new ATS routes (Johannesburg to Atlanta and Durban to Atlanta)	To be discussed between Brazil, South Africa, USA and international organizations concerned.	Users prefer random routes**.** Have been cautioned on the potential risk of crossing the EUR/SAM corridor at random entry/exit points.
2/5	AIC for implementation of RNP 10/50 NM lateral spacing in the EUR/SAM corridor	Action taken	
2/6	Implementation time-scales for the implementation of RNP	ongoing	Brazil, Cape Verde, Senegal and Spain. Status to be reviewed by SAT/TF (February 2001)
3/1	Amendment of the Regional Supplementary Procedures (Doc. 7030)	ongoing	To be submitted to States and Organizations concerned by first week of December 2000. (Draft already reviewed by HQ)

Conclusions	Title	Action Taken	Remarks/Responsibility
3/2	AIC for implementation of RVSM in the EUR/SAM corridor	Action taken	
3/3	Co-operation with other States and Organizations	ongoing	Will seek assistance from Euro-control and SATMA
3/4	Implementation time-scales for implementation of RVSM	ongoing	Brazil, Cape Verde, Senegal and Spain. Status to be reviewed by SATTF (February 2001)
4/1	Processing of flight plans	Not satisfactory	Reviewed by SAT/9-New conclusion
4/2	Introduction of the active supervision node (ASN) and back-up supervision node (BSSN) concepts and a maintenance strategy	Not completed	Brazil, Cape Verde, Senegal and Spain -CAFSAT network
5/1	Operational approval of aircraft intending to operate in an RNP 10 environment	ongoing	SATTF to follow-up.

4.3 Based on the foregoing the meeting concluded that:

Conclusion 4/1: Follow-up action on SAT/8 TF 1 Conclusions

That States and Organizations concerned be urged to take appropriate action on the conclusions emanating from SAT/8TF1 meeting as necessary.


UN866
A/UN 873
UN858
UN857
UN741
KONBA
SAMAR
VASTO
NELSO
TERTO
LISBON/CANARIAS
CASABLANCA/
/CANARIAS
LZR
GOMER
GDV
TMA
UN741
UN866
A/UN 873
UN857
CANARIAS/SAL
UR976
CVS
UR976
UA302
YF
UA602
SAL/DAKAR
UN857
UA302
UN873
NANIK
DEKON
TASIL
RAKUD
ERETU
DAKAR/RECIFE
UN741
UN866
UN873
B/UB623
UN857
F. de Noronha
Recife
Plano
Nanuque
Marisa
Fernando de Noronha
Fortaleza
Natal
Recife
Mossoro
UG741
B623
UN857
To Victoria (VTR)
Campinas
Plane
Confins

Agenda item 5 : Status of amendment proposals of Doc 7030 for the implementation of RNP 10, in-flight contingencies and RVSM in the EUR/SAM corridor

5.1 Under this agenda item the meeting was apprised of the status of the amendment proposals developed within the framework of the SAT meetings for the implementation of RNP10, in-flight contingencies and RVSM in the EUR/SAM corridor. It was pointed out that the draft is being finalized by ICAO and will be submitted to States and Organizations concerned by the second week of December 2000.

5.2 The meeting emphasized the need to expedite the amendment process in order to meet the target dates, which have been established for RNP 10 operations and the early implementation of RVSM along ATS route UN741. Slight amendments were made to the draft proposals. The final drafts are indicated at **Appendices B1, B2 and B3** of the Report.

5.3 Based on the foregoing the meeting concluded that:

Conclusion 5/1: Amendments to Doc 7030 for the implementation of RNP10, in-flight contingencies and RVSM in the EUR/SAM corridor.

That:

a) That the Secretariat ensures that the procedures for the amendment of the Regional Supplementary Procedures Doc 7030 for the introduction of RNP10, in-flight contingencies and RVSM be processed in a timely manner so that the planned date of implementation is not delayed;

b) the Secretariat ensures that the proposed amendments to the drafts be considered; and

c) Editorial amendments to the Air Navigation Plan be carried out for the new route network.

Agenda Item 6: Communications
- AFTN
- ATS/DS, etc.
- CAFSAT Network and other related COM

6.1 Under this Agenda Item, the meeting reviewed the AFS and AM(R)S communication requirements and the implementation status pursuant to recommendations emanating from the current AFI and CAR/SAM Air Navigation Plans for the EUR/SAM corridor. Emphasis was put on ways and means of finding solutions to the current communications deficiencies/shortcomings, and plans to implement applications related to the CNS/ATM systems were also discussed.

Aeronautical Fixed Communications (AFS)

6.2 The meeting noted the deficiencies affecting the analogue ATS speech circuit Dakar ACC-Recife ACC and the AFTN circuits linking the AFTN communication centres of Brazil and Dakar. In this regard, it was noted that, with the implementation of the CAFSAT network nodes at Dakar (to be operational by November 2000) and Recife (February 2001), the following channels would be implemented in replacement to the ones currently being used:

1) A 8 Kbps, ITU G728 digital voice channel for ATS coordination purposes between the ACCs of Dakar and Recife (Atlantico ACC in the future); and

2) An AFTN/X.25 channel at a minimum of 2.4 Kbps modulation rate linking Dakar and Brazil AFTN communication centres.

Note: Dakar AFTN communication centre uses the X25 protocols since 1991.

6.2.1 Likewise, it was noted that Spain and Brazil have agreed to route the current AFTN/X.25 circuit Brazil-Madrid using the CAFSAT, in order to connect the Brazil AFTN communication centre with the Spanish REDAN network.

6.2.2 The meeting was informed of the current implementation of the South American digital network (REDDIG) and noted that at Recife a CAFSAT node and a REDDIG node would be implemented, which will allow the inter-connection of both networks in a simple and efficient way. Concerning this matter, the meeting noted that the requirements of inter-connection are related only with the transfer of data messages between both networks environments by means of the mentioned AFTN circuits and the future data circuits belonging to the global ATN backbone. The meeting noted that the open architecture of the CAFSAT and REDDIG networks facilitate the inter-connection.

6.3 The meeting examined the shortcomings concerning AFS communication requirements between South Africa and Argentina, Brazil and Uruguay respectively. In this regard, the meeting considered, among other possibilities, three alternatives to eliminate in a reliable and efficient way the mentioned shortcomings, which are documented in Appendix A to this part of the Report, in which is also shown some alternatives regarding AFS circuits currently implemented using PTT services. South Africa indicated that the proposed alternative solutions need to be analysed by its technical personnel before taking any decision on the proposed options. In this regard, the meeting agreed with South Africa's position and invited the administration to make all efforts to submit its decision on the mentioned alternatives through the ICAO Regional Office concerned for consideration by the next SAT Task Force Meeting. In this regard, the meeting formulated the following Conclusion:

Conclusion 6/1: Shortcomings concerning AFS communication requirements between South Africa and Argentina, and between Brazil and Uruguay

South Africa will study the connection alternatives contained in Appendix A to this part of the report for the improvements in the AFS within area of routing AR-2, and will submit its decision to ICAO before the forthcoming SAT Task Force meeting, scheduled to be held in the second quarter of 2001, subject to technical requirement specifications being met.

The meeting agreed that the technical specifications of the REDDIG and CAFSAT networks will be forwarded to South Africa.

Aeronautical Mobile (en-route) Service (AM(R)S)

6.4 The meeting, in discussing the AM(R)S, focused its attention to the deficiencies in the HF voice communications and matters related with the VHF voice air-to-air communication channel.

Air-to-air communication channel

6.5 The meeting noted that, as part of Amendment 74 to ICAO Annex 10, the VHF frequency 123.45 MHz was standardized worldwide for the air-to-air communication channel (Annex 10, Vol. V, Chapter 4, par. 4.1.3.2) to enable aircraft engaged in flights over remote and oceanic regions out of the range of VHF ground stations to exchange necessary operational information to facilitate the resolution of operational problems. It was also noted that the mentioned Standard, which is applicable as of 2 November 2000, eliminated the need of Regional Air Navigation meetings to recommend for each region a specific air-to-air channel, which were earlier published in Doc. 7030 (130.55 for CAR/SAM

regions and 128.95 for the AFI region). In this regard and in order to encourage the applicability of the indicated Standard, the meeting formulated the following Conclusion:

Conclusion 6/2: Air-to-air communication channel.

States be invited to promulgate the use of air-to-air frequency 123.45 Mhz in accordance with the provisions of Annex 10, Vol. V, Chapter 4, par. 4.1.3.2.

HF voice communication deficiencies and revision of the HF ICAO network designators.

6.6. The meeting reviewed information on HF communication deficiencies and noted that flight operations between South Africa and South America in the Johannesburg oceanic region experienced difficulties in establishing HF communications with Brasilia and Ezeiza. It was also noted that the lack of reliable AFS communications increases the problem. In this regard, Argentina indicated that, recently, new HF systems were implemented for Ezeiza and that, during 1999, the antennas yards were also upgraded. On the other hand, Brazil recognized that problems exist at the Brasilia aeronautical station to cover with HF the corresponding area of service for the oceanic area and that a better service is being currently provided from Recife with HF systems covering the continental and oceanic areas. However, efforts are being made to implement a modern HF system for the future Atlantico FIR (to be implemented in 2003), which would assure the adequate HF voice communication coverage for its oceanic FIR.

6.6.1. In order to determine the real current situation of the HF communications, IATA offered to perform a communication test based on a procedure currently used by the aircraft companies. In this regard, it was agreed that the mentioned test should be carried out to the South of parallel 20^{o}S during the second and third weeks of December 2000, and the results of the same should be addressed to the concerned ICAO Regional Offices.

6.6.2. It was noted that the AM(R)S plans are based on Appendix S27 to the ITU Radio Regulations. In this regard, it was also noted that the aeronautical stations recommended by ICAO and located in the ITU WMARAs AFI, SAM and SAT are using the ICAO established network designators AFI-1, AFI-2, SAM-1, SAM-2, SAT-1 and SAT-2. The meeting was requested to review the recommendations concerning the allocation of ICAO network designators recommended for each aeronautical station, aimed at establishing a more efficient HF voice communications and provision of an adequate support and monitoring to the air operations in the oceanic regions. In this regard, the meeting agreed that this study, should be carried out by the APIRG and GREPECAS regional planning groups, based on documentation prepared by the ICAO Regional Offices. In

connection with this matter, IATA and IFALPA were encouraged to report the corresponding HF deficiencies/shortcomings using the standard format approved by the ICAO Council. Considering the above, the meeting formulated the following Conclusion:

Conclusion 6/3: Improvements of the HF communications

That:

a) as an urgent matter, Argentina and Brazil should take the necessary measures, including the review of the communication procedures, to improve the current situation of the HF communication coverage in the Oceanic areas of the Ezeiza and Brasilia FIRs;

b) South to parallel 20°S, IATA be invited to carry out a HF communication survey during the second and third weeks of December 2000, and the test results be submitted to the concerned States and ICAO Regional Offices;

c) the ICAO Secretariat prepares documentation for the revision of the CAR/SAM and AFI Air Navigation Plans by GREPECAS and APIRG concerning the recommendations for allocation of HF network designators for the aeronautical stations in the concerned parts of the AFI, SAM and SAT WMARAs; and

d) in support of c) above, IATA and IFALPA, using the standard methodology approved by the ICAO Council, continue the reporting of deficiencies/shortcomings to the concerned Regional Planning Groups and ICAO Regional Offices.

6.6.3 The meeting considered an initiative to implement an air-ground communication using the SATCOM voice communication service provided by Inmarsat. In this regard, the meeting was informed that most of the aircraft operating in the South Atlantic area were equipped with SATCOM, and calls to the ACCs through the public switched telephone network (PSTN) system, in case of no HF communications, could be received. It was noted that the SATCOM implementation requires at the ground stations the implementation of a telephone set connected to the PSTN and implemented with automatic voice recording. In this regard, the meeting noted that Uruguay has already implemented the mentioned telephone set with its number included in the AIP. Considering useful this alternative, the meeting formulated the following Conclusion:

Conclusion 6/4: SATCOM voice communications

That Argentina and Brazil consider the implementation at the ACCs of Brasilia and Ezeiza, a telephone set connected to the PSTN with automatic voice recording in order to receive voice SATCOM calls from the aircraft in case that no HF communication is established and the corresponding number be promulgated in the relevant AIPs.

Surveillance and other CNS/ATM system concept matters

6.6.4 Spain presented a proposal to use the CAFSAT network in order to implement ADS/CPDLC in the EUR/SAM corridor, based on the system implemented in Canarias ACC that operates with the avionics FANS 1/A. The proposal contemplates the display at the ACCs of air traffic of those FANS 1/A equipped aircraft and, also, an advanced configuration to provide CPDLC functionality. In this regard, it was proposed that a Technical Working Group (TWG) be created to propose a common model of systems for all ACCs, considering equipment capability, significance of investments and expenses of operation.

6.6.5 The meeting noted Spain's proposal and was informed of plans by Senegal (2002) and Cape Verde (2004) in relation to the implementation of full ADS/CPDLC functionalities according to the AFI CNS/ATM implementation plan (AFI Doc 003). In this regard, Brazil also informed the meeting that plans are being made to implement ADS/CPDLC in connection with the implementation of Atlantico FIR.

6.6.6 Concerning the activation of the TWG, the meeting agreed with the proposal, but extended the scope of its work in order to harmonize the CNS/ATM systems planning and implementation issues in the EUR/SAM corridor, based on the ICAO policies and SARPs. In this regard, the meeting formulated the following Conclusion:

Conclusion 6/5: Technical Working Group established by the SAT/9 Meeting

That, as part of the SAT meetings mechanism, a Technical Working Group be established to study issues related with the planning and implementation of CNS/ATM systems in the EUR/SAM corridor, according to the Terms of Reference, Work Programme and Composition indicated in Appendix A-2 of the Report.

ALTERNATIVE OPTIONS TO FULFIL THE AFS REQUIREMENTS OF JOHANNESBURG WITH THE CAR/SAM, AFI AND EUR REGIONS

Three different alternatives, reviewed during the SAT/9 Meeting for the fulfillment of the AFS requirements of Johannesburg with the CAR/SAM, AFI and EUR regions are shown in this Appendix. In every case, both ATS/DS and AFTN circuits have been taken into account. When using satellite communications as transmission mode, the delay factor is a main issue while planning voice circuits, and ICAO and ITU Recommendations applied. The total end-to-end delay of voice communications must be less of 400 milliseconds.

Option 1: **CAFSAT station placed in Johannesburg**

As it is shown in the figure 1, the node of Johannesburg needs to be established with a global carrier of the INTELSAT IS-801, in order to give connectivity with Recife, Dakar and the EUR region through Canarias. The voice and data traffic to/from the CAR/SAM region is switched at Recife. The ATS/DS circuits with Ezeiza and Montevideo could be established with a double hop (CAFSAT and REDDIG). AFTN transparent data channels could be implemented satisfactorily. The Recife CAFSAT global bandwidth is used to make these voice and data connections. Space segment costs are subject to negotiation between the parts involved.

Option 2: **REDDIG station placed in Johannesburg**

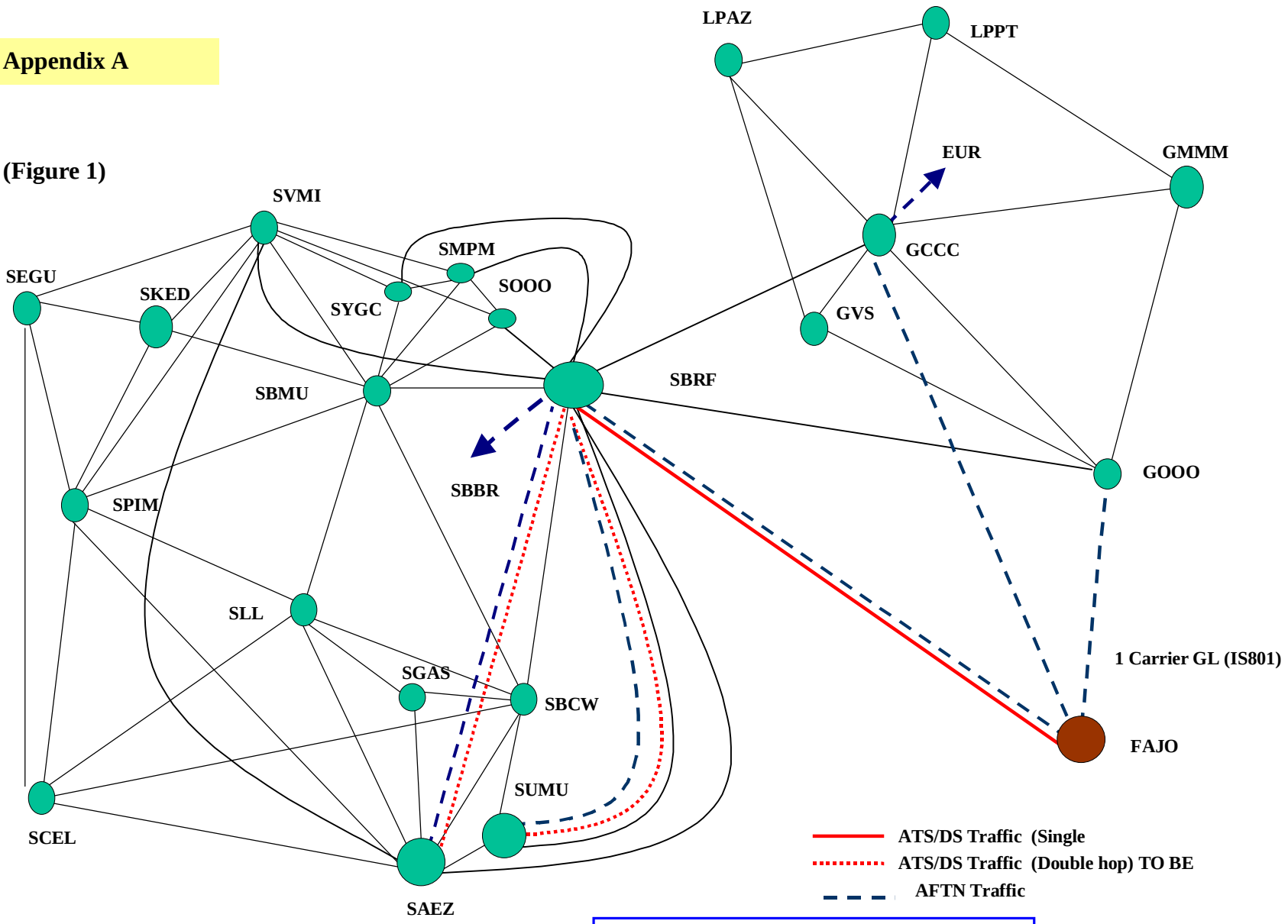
This option, shown in the figure 2, can be implemented without double hops in the voice channels. The AFTN traffic to/from the AFI and EUR regions are switched transparently at Recife, using 2 data channels, and reducing a 50% the use of the Recife CAFSAT global bandwidth. Even though, space segment costs are subject to negotiation between the parts involved. All ATS/DS requirements of Johannesburg to/from Recife, Ezeiza and Montevideo are accomplished individually and may be established immediately upon request of the parts. The node of Johannesburg will need to contract a zone beam carrier on the SE beam of the INTELSAT 903, which e.i.r.p could allow to reduce the RF equipments to implement while comparing it with the option 1, shown above. Ezeiza, Montevideo and Recife may need to add additional bandwidth to the REDDIG carriers in order to implement east-west satellite traffic with Johannesburg.

Option 3: **Implementation of a terrestrial digital link between Ezeiza and Johannesburg**

As proposed by Argentina (SAT/9 WP21), this option shown in the figure 3, could solve the requirements of Johannesburg with all the regions involved. In this case, a 32 Kbps Frame Relay digital link with a 50 % CIR (voice priority) could be established. The AFTN traffic to/from AFI and EUR regions should be switched transparently through the REDDIG nodes of Ezeiza and Recife to enter the CAFSAT network for reaching Dakar and Europe. This digital link must be rented by South Africa and Argentina on a permanent basis and the costs are subject to negotiation between all States involved.

Appendix A

(Figure 1)

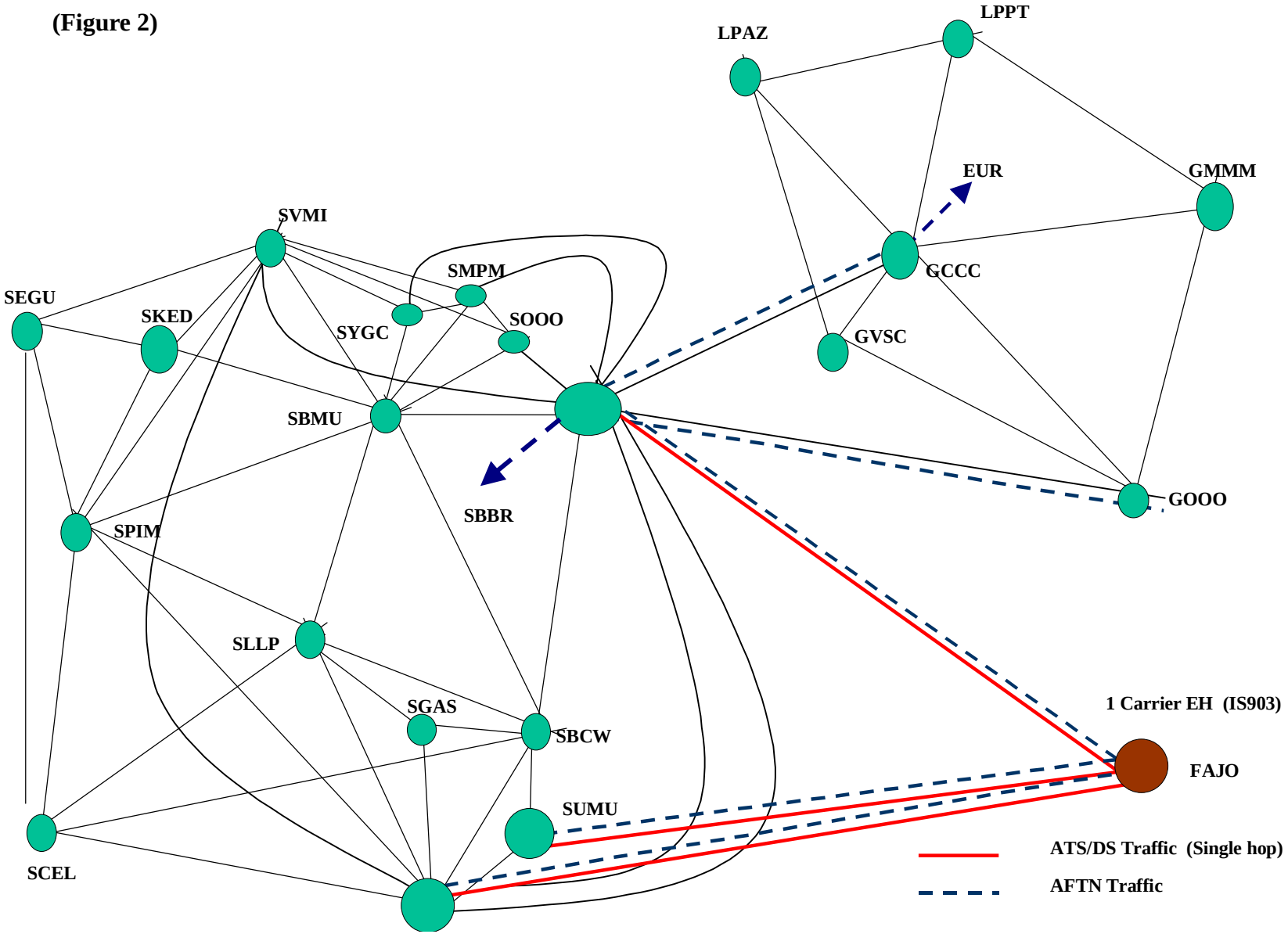


CAFSAT station in Johannesburg

Appendix A

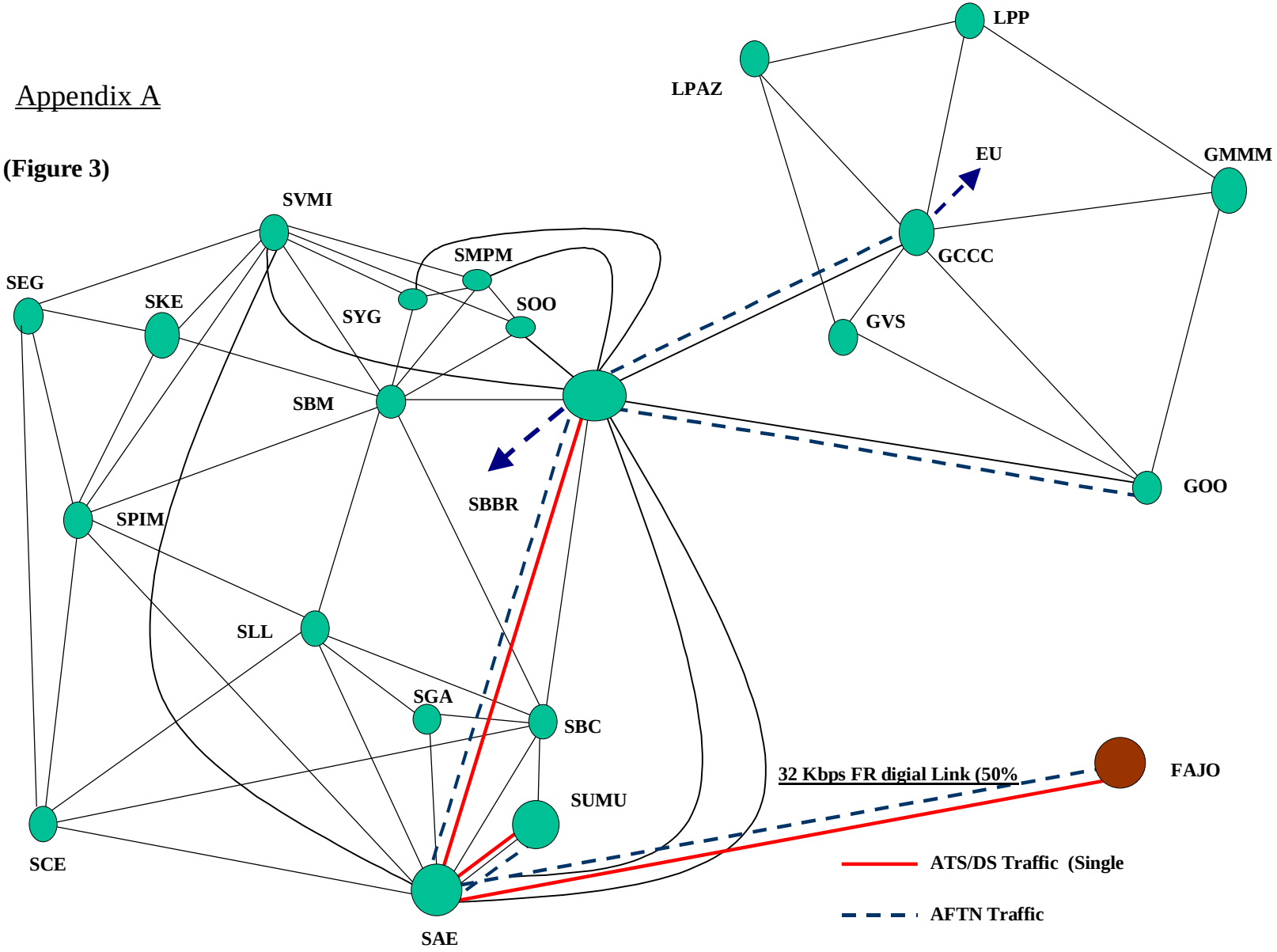
REDDIG station in Johannesburg

(Figure 2)



Appendix A

(Figure 3)



Digital link between Johannesburg & Ezeiza

Agenda Item 7: Any other business

7.1 The meeting was apprised of the new ATS system being implemented by the Air Navigation Agency (ASA) in Cape Verde, in collaboration with IATA and noted the different applications of the new CNS/ATM systems to be installed.

7.2 Installation of the new system is due to start by November 2003 and site acceptance test will be conducted in February 2004.

7.3 The meeting also informed of the ADS and CPDLC data-link applications to be installed by ASECNA for the Dakar Oceanic FIR and noted that it will be operational in 2002.

7.4 The meeting visited the Lima ACC at the invitation of CORPAC and noted that ADS facilities have been installed and are being used for training purposes.

7.5 The meeting also noted a presentation made by the United States in relation with their experiences in civil/military coordination matters.

7.6 **SAT/9 Task Force Meeting for the EUR/SAM corridor (AR-1/HA 1)**

7.6.1 The SAT/9 Task Force Meeting will be held in the second week of February and will be hosted by Spain. The Terms of Reference, Work Programme and Composition are at **Appendix A-1** to the Report

7.7 **SAT/9 Technical Working Group Meeting (TWG)**

7.7.1 The SAT TWG meeting with be held just prior to the SAT/9 TF meeting and will be hosted by Spain. The Terms of reference, Work Programme and Composition of the SAT TWG are at **Appendix A-2** to the Report.

7.8 **SAT/9 Task Force Meeting for the homogeneous areas AR-2/HA8**

7.8.1 The SAT Task Force for homogeneous areas AR-2/HA8 will be held in the second quarter of 2001 at a location to be coordinated by the ICAO Regional Offices concerned. The Terms of Reference, Work Programme and composition are indicated at **Appendix A-3** to the Report.

7.9 **SAT/10 Meeting**

7.9.1 The SAT/10 meeting will be hosted by Senegal and will be convened in the month of November 2001.

7.10 **Establishment of a Web page for the EUR/SAM corridor Monitoring Agency (SATMA)**

7.10.1 The meeting noted with appreciation the initiative taken by Spain for the establishment of a Web page for SATMA. It was pointed that the site will be available to the public and would be in the English and Spanish languages. However, the meeting was of the view that certain restricted sections could only be accessed through a password to be provided by SATMA.

7.11 Based on the foregoing the meeting formulated the following conclusion:

Conclusion 7/1: SAT/9 Task Force meeting for homogeneous areas AR-1/HA-1

That The SAT/9 Task Force Meeting will be held in the second week of February and will be hosted by Spain. The Terms of Reference, Work Programme and Composition are at Appendix A-1 to the Report.
Note: The system development plan and the CNS/ATM implementation plan for area of routing AR-1/HA1 is also attached

Conclusion 7/2: SAT/9 Technical Working Group Meeting (TWG)

That the SAT TWG meeting with be held just prior to the SAT/9 TF meeting and will be hosted by Spain. The Terms of reference, Work Programme and Composition of the SAT TWG are at **Appendix A-2** to the Report.

Conclusion 7/3: SAT/9 Task Force Meeting for the homogeneous areas AR-2/HA8

That the SAT Task Force for homogeneous areas AR-2/HA8 will be held in the second quarter of 2001 at a location to be coordinated by the ICAO Regional Offices concerned. The Terms of Reference, Work Programme and composition are indicated at Appendix A-3 to the Report.
Note the *CNS/ATM implementation plan for area of routing AR-2/HA8 is also attached.*

Conclusion 7/4: SAT/10 Meeting

That the SAT/10 meeting will be hosted by Senegal and will be convened in the month of November 2001.

Conclusion 7/5: Establishment of a Web page for the EUR/SAM corridor Monitoring Agency (SATMA)

That SATMA be the official Web page site of the web page

TERMS OF REFERENCE OF TASK FORCE ESTABLISHED BY THE SAT/9 MEETING (AR-1/AH-1)

Taking into account of the evolutionary implementation of CNS/ATM systems in the EUR/SAM corridor, the Task Force should explore ways and means of achieving further enhancements in airspace capacity in the area and in particular take necessary steps to ensure the smooth implementation of RNP 10/50 NM lateral spacing and RVSM.

Note: The Task Force will adopt a pragmatic approach and may wish to set up sub-groups if necessary in order to carry out specific tasks.

Work programme

1. Evaluate the results of the safety assessment being carried out by Spain for RNP 10/50 NM lateral spacing and RVSM operations in the EUR/SAM corridor and initiate action through the Secretary for the endorsement of the results by the ICAO Council.

2. Make the go/no go decision on the implementation of the new route network.

3. Follow-up the amendments to the AFI part of the Regional Supplementary Procedures (Doc 7030) concerning procedures to be applicable in an RNP 10/50 NM lateral spacing environment, in-flight contingencies and the implementation of RVSM.

4. Finalize action in accordance with the time-scales which have been established for the:

    - implementation of the new ATS route network in the EUR/SAM corridor on 19 April 2001;
    - limited implementation of RVSM on ATS route UN741;
    - implementation of RVSM on 24 January 2002;
    - ensure that States/ Organizations concerned have taken all necessary measures which were agreed upon; and
    - Develop a common AIC and AIP Supplement in order to implement the new route network and RNP 10.

The Task Force should complete its work and take appropriate action on pressing issues and submit its proposal to the SAT/10 meeting.

Rapporteur:

Spain has been appointed as Rapporteur of the Task Force

Composition:

The Task Force of multi-disciplinary nature shall comprise of experts from States responsible of the FIRs of the EUR/SAM corridor, and experts from adjacent FIRs and international organizations.

EUR/SAM TRAFFIC FLOW (AR-1) SYSTEMS DEVELOPMENT PLAN PROPOSAL (SAT/7 Meeting, Sal, Cape Verde, December 98) Appendix A to Agenda5									
FIRs Casablanca (Oceanic), Canarias (outside TMA), Sal (outside TMA), and concerned flows only in Dakar Oceanic and Recife Oceanic (Lisbon and Santa Maria Oceanic for interface co-ordination only)									
		1998	1999	2000	2001	2002	2003	2004	2005 onwards
ATM									
	Route network	Three fixed parallel routes UA32, UB602, UR1	Addition of a fourth parallel route	Progressive elimination of fixed ATS Route System from West to East					
	Traffic Management	Most traffic operates along fixed routes. Limited random to the West of R1 (UN741) only. Full Air Traffic Control provided		Progressive evolution towards a random RNAV environment (Implementation schedule developed and coordinated by SAT Meetings)					
	*Lateral Separation**	100 NM	50 NM					30 NM	
	Longitudinal separation Time-based	10 minutes							
	Distance-based	80 NM				50 NM			
	Vertical Separation	2000 ft above FL290		Progressive evolution towards RVSM FL290/FL410 (Implementation schedule developed and co-ordinated by SAT Meetings)					
Communications									
	Fixed service	Low speed character oriented AFTN. Sal ACC communications switched via Dakar	High speed data oriented protocols. Direct links between all ACCs concerned. Dial-up satellite facilities back-up for voice communications.	Progressive on-line data interchange between ACC computers in contiguous airspaces (ACCs Casablanca, Canarias, Dakar, Lisbon, Recife, Sal and Santa Maria).					Transition to on-line data interchanges completed.
	Mobile service	Voice only. VHF on upper airspace of Canarias,Casablanca and Sal FIRs. Limited VHF coverage in the Canarias South and Northern Recife FIRs. HF only in Dakar Oceanic FIR.		CPDLC capability in all ACCs concerned.					
Navigation									
	RNP Lower airspace	20							
	Upper airspace		10						5
Surveillance									
	Independent	Full SSR coverage in the Canarias UTA. Extensive coverage in the Casablanca UIR. Good coverage up to 250 NM from Northern Coast of Brasil and Fernando Noronha. No SSR coverage of Canarias FIR South of UTA, and whole of Dakar and Sal Oceanic FIRs							
	Dependent	Ground systems to process both character based and ATN protocols for Automatic Dependent Surveillance (ADS) and Automatic Position Reporting (APR). Introduction of situation displays in ACCs (Plots driven either by ADS or FDPS, suitably identified) ATC computer assisted strategic conflict prediction and resolution.							
		Trials and demonstrations		Progressive operational application					Full ground capability achieved
*** Outside RNP10 airspace, higher minima will apply as promulgated.**									

AFI CNS/ATM IMPLEMENTATION PLAN
PROGRAMME OF ACTIVITIES

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
M-SG EUR/SAT AR-1	ATM	Separation longitudinal	SAT/Group

5. **Title**	Reduction of longitudinal separation minima applying Mach Number Technique (MNT)
6. **Description**	Present longitudinal separation minima is 10 minutes. Will also include ATS route UA302
7. **Shortcoming or Objective Addressed**	Present longitudinal separation minima lead to unavailability of economic flight trajectories during peak periods
8. **Expected benefits**	Increased airspace capacity and reduced delays
Required elements	
9. **Airborne**	RNAV Voice/Data communications, MNT
10. **Ground**	Availability of ATS/DS circuits between ATS units, extended VHF coverage MNT, Voice/data communications
11. **Cost benefit assessment:** High	

12. **Area of applicability**	13. **States concerned**
Selected volume of airspace in FIRs: Casablanca, Canarias, Dakar Oceanic, Recife and Sal	Brazil, Cape Verde, Morocco, Senegal and Spain .
14. **Phases**	15. **Target dates**
Extended VHF coverage Operational application Operational application UA302	1996 1998 1999

16. **Related Activities** (*all other related Activities*)

17. **Additional requirements which would increase the benefits**

Common application date by NOTAM
Implemented since 23 April 98 (except for UA302)

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
M-SL EUR/SAT **AR-1**	ATM	Separation lateral	SAT/Group
5. **Title**	Reduction of lateral separation minima		
6. **Description**	Lateral separation minima will be reduced from the present 100NM to 50NM. Second phase from 50 NM to 25 NM		
7. **Shortcoming or Objective Addressed**	System capacity constraints		
8. **Expected benefits**	Increase system capacity to provide optimum flight profiles to aircraft.		
Required elements			
9. **Airborne**	RNP 10 approval/certification; RNP 5 for 2004 - 2nd phase. Voice/Data communications		
10. **Ground**	Voice/Data communications Pilot position reports.		
11. **Cost benefit assessment:** Estimated high. To be quantified.			
12. **Area of applicability**	13. **States concerned**		
Oceanic airspace to be specified in FIRs: Casablanca, Canarias, Dakar Oceanic, Recife and Sal	Brazil, Cape Verde, Morocco, Senegal and Spain .		
14. **Phases**	15. **Target dates**		
50 NM 25 M RNP 5 RNP 10	1999 - 2004 2004 - onwards 1998 Casablanca and Canarias FIRS 1999 - 2004: Other FIRs		
16. **Related Activities** (*all other related Activities*)			
Amendment to the SUPPS Doc 7030 M-RNP EUR/SAT			
17. **Additional requirements which would increase the benefits**			
WGS-84 datum			

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
M-RR EUR/SAT AR-1	ATM	Random Routing	SAT/Group

5. **Title**	Random routing EUR/SAT
6. **Description**	Availability of random routing in a defined volume of airspace along the EUR/SAT traffic flows.
7. **Shortcoming or Objective Addressed**	Present fixed route system results in less than optimum flight profiles.
8. **Expected benefits**	Availability of more economic routings.
Required elements	
9. **Airborne**	DCPC (Voice/Data) RNP approval/certification FMS; AOC data link; Direct flight plan uploads
10. **Ground**	DCPC (Voice/Data) AOC data link Flight plan generation AOC/ATS data communications

11. **Cost benefit assessment:** Estimated high. To be quantified.

12. **Area of applicability**	13. **States concerned**
Oceanic airspace to be specified within FIRs: Casablanca, Canarias, Dakar Oceanic, Recife and Sal	Brazil, Cape Verde, Morocco, Senegal and Spain .
14. **Phases**	15. **Target dates**
Progressive elimination of fixed ATS route system from West to East	2000 -2005

16. **Related Activities** (all other related Activities)

Amendment to Doc. 7030
S-ADS EUR/SAT
C-MD(V/S/H) EUR/SAT

17. **Additional requirements which would increase the benefits**

ADS
DCPC
FDPS

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
M-RR EUR/SAT AR -1	ATM	Vertical separation	SAT/Group

5. **Title**	Present vertical separation is 2000 ft above FL290
6. **Description**	Present vertical separation minima lead to unavailability of economic/preferred flight levels during peak periods
7. **Shortcoming or Objective Addressed**	Present fixed route system results in less than optimum flight profiles.
8. **Expected benefits**	Increased airspace capacity and reduced delays
Required elements	
9. **Airborne**	RVSM certification/Operational approval Voice/Data communications
10. **Ground**	Availability of reliable ATS/DS circuits between ATS units, extended VHF coverage and trained personnel Height monitoring sampling Voice/data communications

11. **Cost benefit assessment:** Estimated high. To be quantified.

12. **Area of applicability**	13. **States concerned**
Oceanic airspace to be specified within FIRs: Casablanca, Canarias, Dakar Oceanic, Recife and Sal	Brazil, Cape Verde, Morocco, Senegal and Spain .
14. **Phases**	15. **Target dates**
Extended VHF Progressive evolution towards RVSM	1996 2000 - 2005

16. **Related Activities** (all other related Activities)

Amendment proposal to Doc. 7030

17. **Additional requirements which would increase the benefits**

Common application date by NOTAM

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
C-MD(V/S/H) EUR/SAT AR-1	Communications	Data link	SAT/Group

5. **Title**	DCPC (data) via VHF, satellite and/or HF data link along the Europe to South America routes.
6. **Description**	This capability allows aircraft operating in the EUR/SAT routes to exchange ATS messages with ATS units using data link.
7. **Shortcoming or Objective Addressed**	Present exchanges of ATS messages via HF are inherently unreliable resulting in need for increased longitudinal separation minima and reduced freedom of flight.
8. **Expected benefits**	RNP along specific itineraries as a result of improved communications(2000), reduced longitudinal separation minima (1995) and random routings in selected portions of the airspace starting in year 2000.
Required elements	
9. **Airborne**	Satellite and VHF air/ground data communications capab ility. HF data link communications capability
10. **Ground**	Satellite and/or VHF air/ground data communications capability Flight data processing system (FDPS). HF data communications capability

11. **Cost benefit assessment:** High benefits expected from improved communications. To be quantified.

12. **Area of applicability**	13. **States concerned**
FIRs: Canarias, Casablanca, Dakar Oceanic, Recife and Sal.	Brazil, Cape Verde, Morocco, Senegal and Spain (Canarias).
14. **Phases**	15. **Target dates**
Trials and demonstrations	1999
Limited Operational service	2000 - onwards

16. **Related Activities** (all other related Activities)

Coordination with the SAM Region . Coordination with service providers

17. **Additional requirements which would increase the benefits**

Standardized message formats and contents

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
N-RNP EUR/SAT **AR - 1**	Navigation	RNP 10	SAT/Group

5. **Title**	Required Navigation Performance
6. **Description**	Definition and publication of a navigation performance value to be attained by traffic operating in a specified volume of airspace between Europe and South America.
7. **Shortcoming or Objective Addressed**	Reduction of present 100NM lateral separation minima to 50NM (RNP 10) Second phase: 25 NM (RNP 5)
8. **Expected benefits**	Lower lateral separation minima will allow for the more frequent availability of user preferred profiles.
Required elements	
9. **Airborne**	RNP 10 approval/certification DCPC (Voice/data)
10. **Ground**	Amendment to Doc. 7030.

11. **Cost benefit assessment:** Estimated to be high. To be quantified.

12. **Area of applicability**	13. **States concerned**
Oceanic airspace to be specified within FIRs: Canarias, Casablanca, Dakar Oceanic, Recife and Sal	Brazil, Cape Verde, Morocco, Senegal and Spain .
14. **Phases**	15. **Target dates**
Publication Operational Application RNP 5 RNP 10 RNP 5	2000 2000 1998 Casablanca and Canarias FIRs 2000 Other FIRs Upper airspace 2004 - onwards Other FIRs

16. **Related Activities** (all other related Activities)

Amendment to Doc 7030

17. **Additional requirements which would increase the benefits**

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
S-ADS EUR/SAT AR-1	Surveillance	Dependent	SAT/Group
5. **Title**	Automatic Dependent Surveillance EUR/SAT		
6. **Description**	To establish a capability in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position, and additional data as appropriate to ATS units.		
7. **Shortcoming or Objective Addressed**	Lack of displays at ATS units of air traffic situation outside radar coverage lead to increased separation minima and constrained freedom of flight, both of which impact negatively on airspace users.		
8. **Expected benefits**	Better accommodation of user preferred trajectories, resulting in more economic flight profiles.		
Required elements			
9. **Airborne**	ADS avionics capability. DCPC (voice/data)		
10. **Ground**	DCPC (voice/data) ADS workstation Software: Capability to process and display ADS messages and eventually Current Flight Plan derived flight profiles.		
11. **Cost benefit assessment:** Estimated to be high. To be quantified.			
12. **Area of applicability**	13. **States concerned**		
Oceanic airspace to be specified within FIRs: Casablanca, Canarias, Dakar Oceanic, Recife and Sal	Brazil, Cape Verde, Morocco, Senegal and Spain .		
14. **Phases**	15. **Target dates**		
*Trials and demonstrations Limited functionality Full Operational functionality	2000 2001 - 2004 2005		
16. **Related Activities** (all other related Activities)			
C-MD(V/S/H) EUR/SAT Coordination with the SAM Region. **Note: ADS already available in Canarias ACC. Trials with full system capability to start soon*			
17. **Additional requirements which would increase the benefits**			
(CPDLC).			

TABLE 4

ATM EVOLUTION IN THE CAR/SAM REGIONS – ENROUTE OPERATIONS

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
-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 INFRASTRUCTRE - 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 SPEEC 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 AUTHORITIY 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\TABLE04.DOC)

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.

TERMS OF REFERENCE OF THE TECHNICAL WORKING GROUP (TWG) ESTABLISHED BY THE SAT/9 MEETING

Considering the GREPECAS and APIRG plans, the TWG should explore ways and means of achieving further enhancements in airspace capacity in the EUR/SAM corridor by exploiting emerging technologies and in particular, taking advantage, where appropriate, of rationalization, integration and harmonization of systems. Implementation of new systems should be sufficiently flexible to accommodate existing and future services in an evolutionary and cost-effective manner. The associated institutional arrangements shall not inhibit competition among service providers complying with relevant ICAO Standards, Recommended Practices and Procedures.

Work programme

1. considering implementation time-frames planned in the AFI and SAM CNS/ATM implementation plans, address cost benefit aspects for the use of ADS/CPDLC and other CNS/ATM applications;

2. In order to facilitate transition to the ATN, evaluate the feasibility of using existing or emerging digital VSAT networks (CAFSAT, ASECNA VSAT, SADC VSAT, REDDIT, etc.) to implement data link systems to support applications such as ADS and CPDLC within the EUR/SAM corridor;

2. Explore the use of emerging new ATM technologies and tools (conflict resolution systems etc…)

3. Consider advantages of internetworking between existing VSAT networks (CAFSAT, REDDIG, ASECNA VSAT, SADC VSAT and other emerging networks) and evaluate the long-term potential benefits.

The TWG should complete its work and submit its proposal to the SAT Task Force. The TWG should also work through correspondence and make optimum use of the internet for consultations with other partners prior to the meeting.

Rapporteur:

Senegal has been appointed as Rapporteur of the TWG

Composition:

The TWG shall be of multi-disciplinary nature shall comprise of experts from States responsible of the FIRs of the EUR/SAM corridor, experts from adjacent FIRs and international organizations and the aeronautical industry.

- -

TERMS OF REFERENCE OF TASK FORCE ESTABLISHED BY THE SAT/9 MEETING (SATTF/AR-2/AH8)

Taking into account of the evolutionary implementation of CNS/ATM systems in the area of routing (AR-2/AH8) -Atlantic Ocean interface between AFI, NAT and SAM Regions, the Task Force should explore ways and means of achieving further enhancements in the communications, navigation and surveillance fields in the area. It will be guided by the requirements identified in the AFI and CAR/SAM CNS/ATM Implementation Plans.

Work programme

1. In accordance with the AFI and CAR/SAM CNS/ATM Implementation Plans:

- Plan for the implementation of a random routing area in the Atlantic Ocean interface between AFI, SAM and NAT Regions
- Consider the implementation/creation of additional ATS routes *(wherever applicable).*
- Lay down the necessary framework for a reduction of separation minima.
- Consider the provision of air traffic control service.
- Consider the use of the ADS/CPDLC functionality of FANS 1/A equipped aircraft.
- Consider the introduction of RNP in accordance with the AFI and CAR/SAM CNS/ATM implementation Plans.
- Consider improvements in communications services.

2. Consider feasibility of inter-connections between VSAT networks (SADC VSAT, ASECNA VSAT, CAFSAT, REDDIG and other networks).

3. Explore ways and means of taking appropriate measures for the elimination of shortcomings and deficiencies in the area, including communications problems and propose urgent remedial actions.

The Task Force submit its initial proposal to the SAT/10 meeting.

Rapporteur:

South Africa has been appointed as Rapporteur of the Task Force

Composition:

The Task Force of multi-disciplinary nature shall comprise of experts from Accra, Angola, Argentina, Brazil, Cape Verde, Senegal, South Africa, Uruguay and United States, United Kingdom, and experts from adjacent FIRs and international organizations (ASECNA, IATA, IFALPA)

APPENDIX G: CNS/ATM Worksheets

Activity Reference

A sequence of letters identifying the sub-domain, followed by a serial number unique to each activity. The derivation of identifiers is shown in the following Table:

Domains	Areas	Sub-domains	Identifiers
Communications			C
	Mobile Service		C-M
		Voice - HF	**C-MVH**
		Voice - VHF	**C-MVV**
		Data - VHF	**C-MDV**
		Data - Satellite	**C-MDS**
		Data - HF DL	**C-MDH**
	Fixed service		C-F
		Character oriented - AFTN	**C-FC**
		BIT oriented - ATN	**C-FB**
		Voice - ATS/DS	**C-FV**
		Interfacility	**C-FI**
Navigation			N
	En-route/TMA		N-R
		VOR/DME	**N-RV**
		RNP	**N-RNP**
	Approach and landing		N-A
		ILS	**N-AI**
		MLS	**N-AM**
		GNSS	**N-AS**
Surveillance			S
	Radar		S-R
		Primary Radar - PSR	**S-RP**
		Secondary Radar - SSR	**S-RS**
	Dependent		S-D
		Automatic - ADS	**S-ADS**
Air Traffic Management			M
	RNAV		M-R
		Fixed	**M-RF**
		Random	**M-RR**
	Conventional routes		**M-C**
	RNP		**M-RNP**
	Separation		M-S
		Longitudinal	M-SG
		Lateral	M-SL
		Vertical	M-SV

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
M-SG Atlantic Ocean(AFI/NAT/SAM) AR-2	ATM	Separation longitudinal	SAT/Group

5. **Title**	Reduction of longitudinal separation minima
6. **Description**	Present longitudinal separation minima of 20 minutes will be reduced to 10 minutes.
7. **Shortcoming or Objective Addressed**	Present longitudinal separation minima lead to unavailability of economic flight trajectories during peak periods
8. **Expected benefits**	Increased airspace capacity and reduced delays
Required elements	
9. **Airborne**	RNAV Voice/data communications
10. **Ground**	Availability of ATS/DS circuits between ATS units, extended VHF coverage MNT, Voice/data communications
11. **Cost benefit assessment:** High	

12. **Area of applicability**	13. **States concerned**
Selected volume of airspace in FIRs: Accra, Johannesburg Oceanic, Dakar Oceanic, Luanda and Sal.	Angola, Cape Verde, Ghana, Senegal and South Africa.
14. **Phases**	15. **Target dates**
ATS/DS circuits Extended VHF coverage Operational application	June 1999 June 1999 2000

16. **Related Activities** (*all other related Activities*)
17. **Additional requirements which would increase the benefits**
Common application date by NOTAM

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
M-RR Atlantic Ocean (AFI/NAT/SAM) interface AR-2	ATM	Random routing	SAT/Group

5. **Title**	Random routing along the Atlantic Ocean (AFI/NAT/SAM) interface
6. **Description**	Availability of random routing in a defined volume of airspace along the Atlantic Ocean (AFI/NAT/SAM) interface traffic flows
7. **Shortcoming or Objective Addressed**	Present fixed route system results in less than optimum flight profiles
8. **Expected benefits**	Flexible track structures provide more economic routings
Required elements	
9. **Airborne**	DCPC (Voice/data) RNP approval/certification FMS AOC data link Direct flight plan profiles
10. **Ground**	DCPC (voice/ data) AOC data link Flight plan generation. AOC/ATS data communications
11. **Cost benefit assessment:** Estimated high	

12. **Area of applicability**	13. **States concerned**
Oceanic airspace to specified in FIRs: Accra, Dakar Oceanic, Johannesburg, Luanda and Sal.	Angola, Cape Verde, Ghana, Senegal and South Africa.
14. **Phases**	15. **Target dates**
Operational application	2005

16. **Related Activities** (*all other related Activities*)

S-ADS Atlantic Ocean (AFI/NAT/SAM)
C-MD(V/S/H) Atlantic Ocean (AFI/NAT/SAM)
Amendment to Doc 7030

17. **Additional requirements which would increase the benefits**

ADS/CPDLC, FDPS, WGS-84 datum

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
C-MDS AFI/NAT/SAM interface AR-2	Communications	Data- link	SAT/Group

5. **Title**	DCPC data via satellite and/or HF datalink along the AFI/NAT/SAM interface.
6. **Description**	This capability allows aircraft operating in the AFI/NAT/SAM interface to exchange ATS messages with ATS units using AMSS/HFDL data link.
7. **Shortcoming or Objective Addressed**	Present exchanges of ATS messages via HF are inherently unreliable resulting in need for increased longitudinal separation minima and reduced freedom of flight.
8. **Expected benefits**	Random routing as a result of improved communications, reduced longitudinal separation minima.
Required elements	
9. **Airborne**	Satellite air/ground data communications capability. HF data link
10. **Ground**	Satellite/HFDL air/ground data communications capability Flight data processing system (FDPS).

11. **Cost benefit assessment:** High benefits expected from improved communications. To be quantified.

12. **Area of applicability**	13. **States concerned**
Oceanic portions of FIRs: Accra, Johannesburg Oceanic, Dakar Oceanic, Luanda and Sal.	Angola, Cape Verde, Ghana, Senegal and South Africa.
14. **Phases**	15. **Target dates**
Trials and demonstrations	June 1999
Operational service	2000 - 2005

16. **Related Activities** (all other related Activities)

Coordination with service providers
Coordination with adjacent NAT and SAM States.

17. **Additional requirements which would increase the benefits**

Standardized message formats and contents

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
N-RNP AFI/NAT/SAM interface **AR-2**	Navigation	RNP 10	SAT/7 Group

5. **Title**	Required Navigation Performance
6. **Description**	Definition and publication of a navigation performance value to be attained by traffic operating in a specified volume of airspace between Africa and South America.
7. **Shortcoming or Objective Addressed**	Reduction of present 100NM lateral separation minima to 50NM .
8. **Expected benefits**	Lower lateral separation minima will allow for the more frequent availability of user preferred trajectories.
Required elements	
9. **Airborne**	RNP 10 approval/certification DCPC (Voice/data)
10. **Ground**	Amendment to Doc. 7030.

11. **Cost benefit assessment:** Estimated to be high. To be quantified.

12. **Area of applicability**	13. **States concerned**
Oceanic airspace to be specified within FIRs: Accra, Dakar Oceanic, Johannesburg Oceanic, Luanda, and Sal	Angola, Cape Verde, Ghana, Senegal and South Africa.
14. **Phases**	15. **Target dates**
Studies Publication Operational Application	1996 1999 2000

16. **Related Activities** (all other related Activities)

Amendment to Doc 7030

17. **Additional requirements which would increase the benefits**

1. **Activity Reference**	2. **Domain**	3. **Sub-Domain**	4. **Coordinator**
S-ADS AFI/NAT/SAM interface AR-2	Surveillance	Dependent	SAT/Group

5. **Title**	Automatic Dependent Surveillance AFI/NAT/SAM interface routes
6. **Description**	To establish a capability in which aircraft automatically provide, via a data link, data derived from on-board navigation and position-fixing systems, including aircraft identification, four-dimensional position, and additional data as appropriate to ATS units.
7. **Shortcoming or Objective Addressed**	Present imprecise displays at ATS units of air traffic situation lead to increased separation minima and constrained freedom of flight, both of which impact negatively on airspace users.
8. **Expected benefits**	Better accommodation of user preferred trajectories, resulting in more economic flight profiles.
Required elements	
9. **Airborne**	ADS avionics capability. DCPC (voice/data)
10. **Ground**	DCPC (voice/data) ADS workstation Software: Capability to process and display ADS messages and eventually Current Flight Plan derived flight profiles.

11. **Cost benefit assessment:** Estimated to be high. To be quantified.

12. **Area of applicability**	13. **States concerned**
Oceanic portions of FIRs: Accra, Johannesburg Oceanic, Dakar Oceanic, Luanda and Sal.	Angola, Cape Verde, Ghana, Senegal and South Africa.
14. **Phases**	15. **Target dates**
Trials and demonstrations Operational Application	1999 2001

16. **Related Activities** (all other related Activities)

C-MD(S/H) AFI/NAT/SAM interface
Coordination with adjacent NAT and SAM States.

17. **Additional requirements which would increase the benefits**

CPDLC

- - - - - - - - - - - - - - - - - - -

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) **ATM EVOLUTION IN THE CAR/SAM(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	
-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 INFRASTRUCTRE - 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 SPEEC 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 AUTHORITIY 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.

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	AMSS													■	■			
Demonstrations/	HF data/datos HF													■	■			
Ensayos y	VHF data/datos VHF										■	■						
Demostraciones	SSR Mode S/SSR Modo S																	
	ATN										■	■	■					
Implementation and	AMSS (OA)															■	■	■
Operational Use/	HF data/datos HF (OA/CA)															■	■	■
Implantación y	VHF data/datos VHF												■	■	■	■	■	■
Uso Operacional	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																	
	WGS-84					■	■	■	■	■	■	■	■	■	■	■	■	■
Implementation and	En-route supplementary/En ruta suplementario				■	■	■	■	■	■	■	■	■	■	■	■	■	■
Operational Use/	Primary/Primario							■	■	■	■	■	■	■	■	■	■	■
Implantación y	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: MONTEVIDEO (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	AMSS													■	■			
Demonstrations/	HF data/datos HF													■	■			
Ensayos y	VHF data/datos VHF										■	■						
Demostraciones	SSR Mode S/SSR Modo S																	
	ATN										■	■	■					
Implementation and	AMSS (OA)															■	■	■
Operational Use/	HF data/datos HF (OA)															■	■	■
Implantación y	VHF data/datos VHF												■	■	■	■	■	■
Uso Operacional	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																	
	WGS-84					■	■	■	■	■	■	■	■	■	■	■	■	■
Implementation and	En-route supplementary/En ruta suplementario			■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Operational Use/	Primary/Primario							■	■	■	■	■	■	■	■	■	■	■
Implantación y	Terminal/NPA																	
Uso Operacional	Precision approach/Aproximacion de precision																	

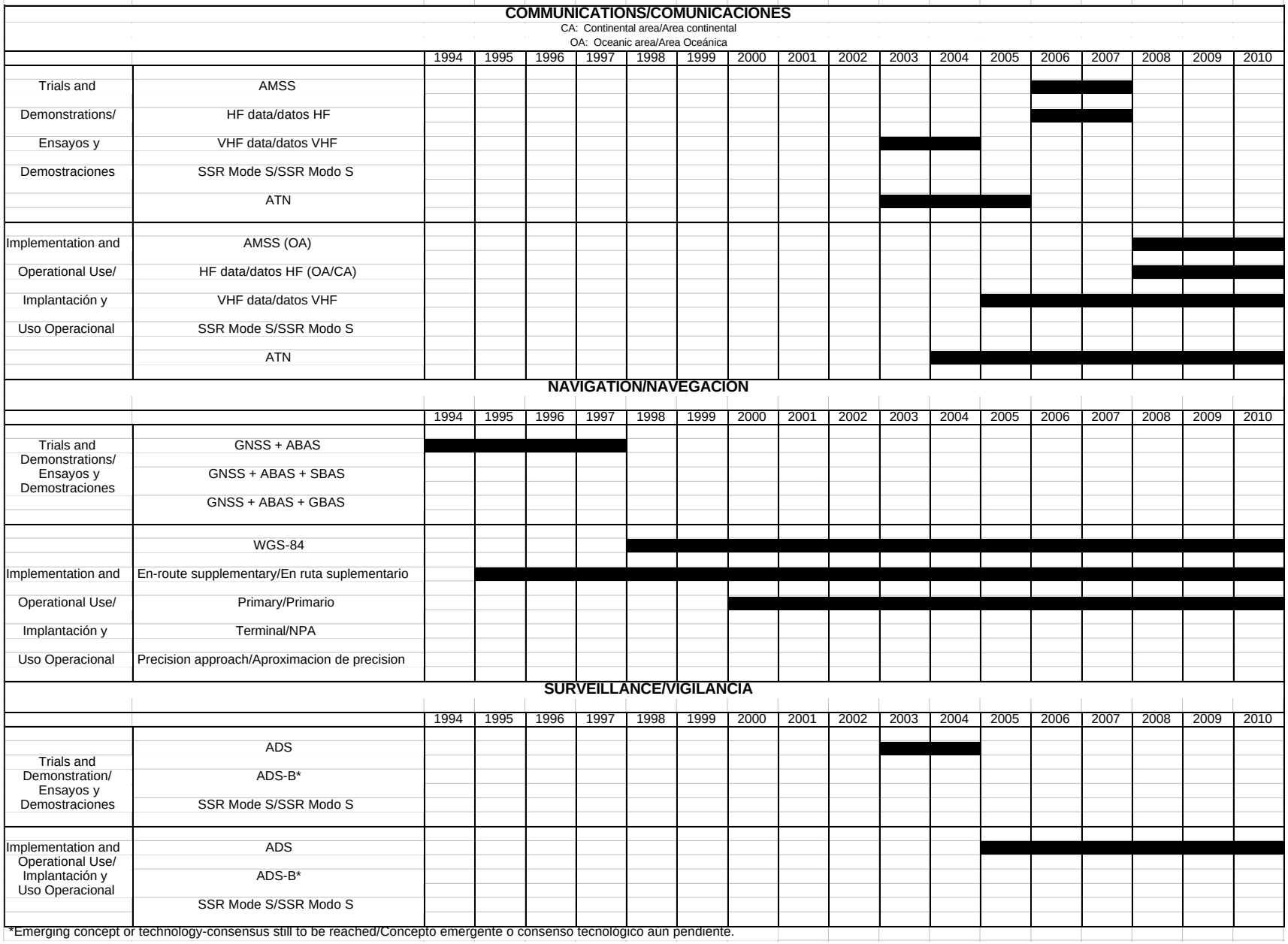
SURVEILLANCE/VIGILANCIA

		1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
	ADS										■	■						
Trials and Demonstration/ Ensayos y Demostraciones	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)



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

DRAFT PROPOSAL FOR AMENDMENT OF THE ICAO REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030)

Special procedures for in-flight contingencies in the EUR/SAM corridor
(Serial No.: WACAF-S 00/1-AFI RAC)

a) **Regional Supplementary Procedures:**

Doc 7030/4-AFI, Part 1 — Rules of the Air, Air Traffic Services and Search and Rescue, up to and including Amendment 198. This amendment proposal has been developed within the framework of Informal Meetings on the Improvement of Air Traffic Services over the South Atlantic organized pursuant to AFI/7 RAN Meeting Recommendation 5/11 and as a follow-up to CAR/SAM/3 RAN Meeting Recommendation 5/26.

b) **Proposed Amendment:**

Amend the SUPPs applicable in the AFI Region as follows:

a) Add the following requirements for "Special procedures for in-flight contingencies" under Section 4.

b) Renumber existing Sections 4 to 13 to read 5 to 14 accordingly.

(cf. Regional Supplementary Procedures, Doc 7030/4-AFI, Part 1 — Rules of the Air, Air Traffic Services and Search and Rescue, up to and including Amendment 198)

c) **Originated by:**

Brazil, Cape Verde, Senegal, Spain, IATA

d) Originator's reason for amendment:

With the proposed introduction of a reduction in longitudinal/ and lateral separation minima to 93 km (50 NM) in an RNAV and RNP10 environment, and the evolutionary implementation of reduced vertical separation in the EUR/SAM corridor, there is a need to introduce special procedures for in-flight contingencies.

e) **Intended date of implementation:**

As soon as practicable after approval by the ICAO Council. Subject to all requirements being met including safety assessments.

Note.— Implementation will be carried out in two phases as follows:

- *Implementation of 93 km (50 NM) lateral spacing based on RNP10 on **19 April 2001**(tentative date); and*

- *Implementation of RVSM on **24 January 2002** (tentative date).*

f) **Proposal circulated to the following States and organizations:**

Algeria	Dominican	Mauritania	South Africa
Argentina	Republic.	Mexico	Spain
Angola	Ecuador	Monaco	Suriname
Austria	Egypt	Morocco	Sweden
Belgium	France	Namibia	Trinidad and Tobago
Brazil	Germany	Netherlands	United Kingdom
Bulgaria	Ghana	Nigeria	United States
Canada	Haiti	Norway	Uruguay
Cape Verde	Hungary	Paraguay	Venezuela
Chile	Iceland	Poland	ASECNA
Colombia	Ireland	Portugal	EUROCONTROL
Côte d'Ivoire	Italy	Romania	IATA
Cuba	Jamaica	Russian Federation	IFALPA
Denmark	Luxemburg	Senegal	

g) **Secretariat's comments:**

Procedures for special in-flight contingencies are not contained in the AFI Part of the Regional SUPPs. The introduction of these procedures will enhance the safety of air traffic services along the EUR/SAM corridor, in particular, with the introduction of 93 km (50 NM) lateral and longitudinal separation minima and RVSM.

Note: As the implementation of 93 km (50 NM) lateral route spacing based on RNAV and RNP 10 will be earlier than the implementation of RVSM, both non-RVSM and RVSM environment procedures have been included.

4.0 SPECIAL PROCEDURES FOR IN-FLIGHT CONTINGENCIES

4.1 Introduction

4.1.1 The following procedures are intended for guidance only and will be applicable within the EUR/SAM corridor. Although all possible contingencies cannot be covered, they provide for cases of:

a) inability to maintain assigned level due to weather, aircraft performance, pressurization failure and problems associated with high level supersonic flight;

b) loss of, or significant reduction in the navigation capability when operating in parts of the airspace where high accuracy of navigation is a prerequisite to the safe conduct of flight operations; and

c) en-route diversion across the prevailing EUR/SAM traffic flow.

4.1.2 With regard to a) and c) above, the procedures are applicable primarily when rapid descent, turn-back or both are required. The pilot's judgement shall determine the sequence of actions taken, and air traffic control shall render all possible assistance having regard to the specific circumstances.

4.2 General procedures

4.2.1 The following general procedures apply to both subsonic and supersonic aircraft.

4.2.1.1 If an aircraft is unable to continue flight in accordance with its air traffic control clearance, and/or an aircraft is unable to maintain the navigation performance accuracy specified for the airspace, a revised clearance shall, whenever possible, be obtained prior to initiating any action, using the radiotelephony distress or urgency signal as appropriate. Subsequent air traffic control action with respect to that aircraft shall be based on the intentions of the pilot and the over-all traffic situation.

4.2.1.2 If prior clearance cannot be obtained, an air traffic control clearance shall be obtained at the earliest possible time and, in the meantime, the aircraft shall:

a) broadcast its position and intentions on the frequency in use, as well as on frequency 121.5 MHz, at suitable intervals stating: flight identification (operator call sign), flight level, ATS route designator, and the extent of deviation expected until air traffic control clearance is received;

b) make maximum use of aircraft lights to make the aircraft visible;

c) watch for conflicting traffic both visually and by reference to ACAS (if equipped);

d) switch on the SSR transponder at all times; and

e) initiate such action as necessary to ensure safety of the aircraft.

4.3 Subsonic aircraft

4.3.1 *Initial action*

4.3.1.1 If unable to comply with the provisions of 4.2, to obtain air traffic control clearance, the aircraft should leave its assigned route or track by turning 90 degrees to the right or left whenever this is possible. The direction of the turn should, where possible, be determined by the position of the aircraft relative to any organized route or track system (e.g whether the aircraft is outside, at the edge of, or within the system). Other factors which may affect the direction of the turn are the direction to an alternative airport, terrain clearance and the flight levels allocated to adjacent routes.

4.3.2 *Subsequent action (RVSM airspace)*

4.3.2.1 In RVSM airspace, an aircraft able to maintain its flight level should:

a) turn to acquire and maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track; and

b) if above FL410, climb or descend 300 m (1 000 ft); or

c) if below FL410, climb or descend 150 m (500ft); or

d) if at FL410, climb 300 m (1 000 ft) or descend 150m (500 ft).

4.3.2.2 An aircraft not able to maintain its level flight should:

a) initially minimize its descent rate to the extent that it is operationally feasible;

b) turn while descending to acquire and maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track; and

c) for the subsequent level flight, a level should be selected which differs from those normally used by 300 m (1 000ft) in above FL410 or by 150 m (500 ft) if below FL410.

4.3.3 *Subsequent action (non-RVSM airspace)*

4.3.3.1 In non-RVSM airspace, an aircraft able to maintain its flight level should:

a) turn to acquire and maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track; and

b) if above FL290, climb or descend 300 m (1 000 ft); or

c) if below FL290, climb or descend 150 m (500 ft); or

d) if at FL290, climb 300m (1 000ft) or descend 150m (500 ft).

4.3.3.2 An aircraft not able to maintain its level flight should:

a) initially minimize its descent rate to the extent that it is operationally feasible;

b) turn while descending to acquire and maintain in either direction a track laterally separated by 46 km (25 NM) from its assigned route or track in a multi-track system spaced at 93 km (50 NM) or otherwise, at a distance which is mid-point from the adjacent parallel route or track; and

c) for the subsequent level flight, a level should be selected which differs from those normally used by 300 m (1000ft) in above FL290 or by 150 m (500 ft) if below FL290.

4.4 **Supersonic aircraft**

4.4.1 *Turn-back procedures*

4.4.1.1 If a supersonic aircraft is unable to continue flight to its destination and a reversal of track is necessary, it should:

a) when operating on an outer track or multi-track system, turn away from the adjacent track;

b) when operating on a random track or on an inner track of a multi-track system, turn either left or right as follows:

1) if the turn is to be made to the right, the aircraft should attain a position 46 km (25NM) to the left of the assigned track and then turn to the right into its reciprocal heading, at the greatest practical rate of turn;

2) if the turn is to be made to the left, the aircraft should attain a position 46 km (25NM) to the right of the assigned track and then turn to the left into its reciprocal heading, at the greatest practical rate of turn;

c) while executing the turn-back, the aircraft should lose height so that it will be at least 1 850 m (6 000 ft) below the level at which turn-back was started, by the time the turn-back is completed;

d) when turn-back is completed, heading should be adjusted to maintain a lateral displacement of 46 km (25NM) from the original track in the reverse direction, if possible maintaining the flight level attained on completion of the turn.

Note.— For other multi-track systems where the route spacing is greater than 93 km (50 NM), the mid-point distance would be used instead on of 46 km (25NM).

4.5 **Weather Deviation Procedure**

4.5.1 General

4.5.1.1 The following procedures are intended to provide guidance. All possible circumstances cannot be covered. The pilot’s judgement shall ultimately determine the sequence of actions taken and ATC shall render all possible assistance.

4.5.1.2 If the aircraft is required to deviate from track to avoid weather and prior clearance cannot be obtained, an air traffic clearance shall be obtained at the earliest possible time. In the meantime, the aircraft shall broadcast its position (including the ATS route designator) and intentions on the frequency in use as well as on the frequency 121.5 MHz and , when available, send its position by data link at suitable intervals until ATC clearance is received.

4.5.1.3 The pilot shall inform ATC when weather deviation is no longer required, or when a weather deviation has been completed and the aircraft has returned to the centre line of its cleared route.

4.5.2 *Obtaining priority from ATC*

4.5.2.1 When the pilot initiates communications with ATC, rapid response may be obtained by stating "WEATHER DEVIATION REQUIRED" to indicate that priority is desired on the frequency and for ATC response.

4.5.2.2 The pilot still retains the option of initiating the communications using the urgency call "PAN PAN" three times to alert all listening parties to a special handling condition which will receive ATC priority for issuance of a clearance or assistance.

4.5.3 *Actions to be taken when controller-pilot communications are established*

4.5.3.1 The pilot notifies ATC and requests clearance to deviate from track, advising when possible, the extent of the deviation expected.

4.5.3.2 ATC takes one of the following actions:

a) if there is no conflicting traffic in the horizontal plane, ATC will issue clearance to deviate from track; or

b) if there is conflicting traffic in the horizontal plane, ATC separates aircraft by establishing appropriate separation; or

c) if there is conflicting traffic in the horizontal plane and ATC is unable to establish appropriate separation, ATC shall:

   1) advise the pilot that standard separation cannot be applied; and

   2) provide essential traffic information for all affected aircraft; and

   3) if possible, suggest an alternative course of action taking into account the traffic situation.

4.5.3.3 The pilot will take the following actions:

a) comply with air traffic control clearance issued; or

b) follow a level suggested by ATC when approximately 19 km (10 NM) from track, along with the procedures detailed in 4.2.1.2 a),b) and c) above;

c) execute the procedures detailed in 4.5.4.1 below. The pilot shall immediately inform ATC of intentions and ATC will issue essential traffic information to all affected aircraft.

4.5.4 *Actions to be taken if controller-pilot communications are not established or revised air traffic control clearance is not available*

4.5.4.1 If contact cannot be established or revised air traffic control clearance is not available and deviation from track is required to avoid weather, the pilot shall take the following actions:

a) comply with the provisions of 4.2.1.2 a) to d);

b) if possible, deviate away from the organized track or route system;

c) for deviations of less than 19 km (10 NM), aircraft should remain at a level assigned by ATC;

d) when the aircraft is approximately 19 km (10 NM) from the track, initiate a level change based on the following criteria:

Route centre line track	Deviations >19 km (10 NM)	Level change
EAST 000° - 179° magnetic	LEFT RIGHT	DESCEND 500 ft CLIMB 500 ft
WEST 180° - 359° magnetic	LEFT RIGHT	CLIMB 500ft DESCEND 500 ft

e) when returning to track, be at its assigned level, when the aircraft is within approximately 19 km (10 NM) of centre line; and

f) if contact was not established prior to deviating, continue to attempt to contact ATC to obtain a clearance. If contact was established, continue to keep ATC advised of intentions and obtain essential traffic information.

Note.— When operating in a parallel route system, pilots need to exercise caution if weather deviation requires the aircraft to enter the protected airspace of the adjacent track. In particular, pilots need to be alert for same direction traffic on an adjacent track at the same level which may also be deviating in the same general direction.

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DRAFT PROPOSAL FOR AMENDMENT OF THE ICAO REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030)

Implementation of 50 NM lateral and longitudinal separation minima based on RNP 10

(Serial No.: WACAF-S 00/2, AFI-RAC)

a) **Regional Supplementary Procedures:**

Doc 7030/4-AFI, Part 1 — Rules of the Air, Air Traffic Services and Search and Rescue, up to and including Amendment 198. This amendment proposal has been developed within the framework of informal meetings on the improvement of air traffic services on the South Atlantic organized route system pursuant to AFI/7 RAN Meeting Recommendation 5/11 and as a follow-up to CAR/SAM/3 RAN Meeting Recommendation 5/26.

b) **Proposed amendment:**

Amend the SUPPs applicable in the AFI Region as follows:
Add the following requirements for lateral and longitudinal separation under Section 6 (6.1 and 6.2).

Note.— With the proposed inclusion of special procedures for in-flight contingencies under Section 4, existing Sections 4 to 13 have been renumbered to read 5 to14

(cf. Regional Supplementary Procedures, Doc 7030/4-AFI, Part 1 — Rules of the Air, Air Traffic Services and Search and Rescue, up to and including Amendment 198.

c) **Originated by:**

Brazil, Cape Verde, Senegal, Spain, IATA

d) **Originator's reason for amendment:**

The reduction in lateral and longitudinal separation minima to 93 km (50 NM) in an RNAV and RNP 10 environment will improve the provision of air traffic services in the areas concerned and is in line with the implementation strategy adopted in the AFI and SAM CNS/ATM implementation plans. In addition, it will reduce the level of difficulty in providing ATS to Southbound traffic in the Canarias FIR, and improve ATC efficiency and airspace capacity.

e) **Intended date of implementation:**

As soon as practicable after approval by the ICAO Council subject to all requirements being met, including a safety assessment, implementation is planned on **19 April 2001** (*tentative date*).

f) **Proposal circulated to the following States and international organizations:**

Algeria	Dominican Republic	Mexico	Spain
Argentina	Ecuador	Monaco	Suriname
Angola	Egypt	Morocco	Sweden
Austria	France	Namibia	Trinidad and Tobago
Belgium	Germany	Netherlands	United Kingdom
Brazil	Ghana	Nigeria	United States
Bulgaria	Haiti	Norway	Uruguay
Canada	Hungary	Paraguay	Venezuela
Cape Verde	Iceland	Poland	ASECNA
Chile	Ireland	Portugal	EURCONTROL
Colombia	Italy	Romania	IATA
Côte d'Ivoire	Jamaica	Russian Federation	IFALPA
Cuba	Luxemburg	Senegal	
Denmark	Mauritania	South Africa	

g) Secretariat's comments:

1) This proposal has been developed within the framework of the Informal SAT Coordination Meetings and is in accordance with the AFI and SAM CNS/ATM implementation plans (AFI/7 Recommendation 5/11).

2) Implementation of the proposed 50 NM lateral route structure will be carried out only after conclusive results of safety assessments show that the target level of safety of 5 x 10-9 fatal accidents per flight hour can be met.

3) Spain has accepted responsibility to establish and operate the monitoring agency to assist with the safe implementation and ongoing monitoring of the route system.

Add the following requirement for lateral separation and longitudinal separation under Section 6 (6.1 and 6.2 accordingly):

Note.— Renumbering of Sections 4 to 13 to read 5 to 14 as a result of proposed inclusion of special procedures for in-flight contingencies under Section 4)

6. **Separation of aircraft**

6.1 **Lateral separation**

(A11— Attachment B; P-RAC, Part III—7 and 9)

6.1.1 Minimum lateral separation shall be:

a) 185 km (100 NM) except that:

b) where aircraft are transiting into an airspace with a larger lateral minimum than the airspace being exited provided that:

1) the smaller separation minimum exists;

2) flight paths diverge by 15 degrees or more until the larger minimum is established; or

3) it is possible to ensure, by means approved by the appropriate ATS authority, that the aircraft have navigation capability necessary to ensure accurate track guidance.

6.1.2 For flights within designated control oceanic routes or areas within the Canarias FIR (Southern sector), Dakar Oceanic, Sal Oceanic and Recife FIRs the minimum lateral separation shall be 93 km (50 NM) between RNAV-equipped aircraft approved to RNP 10

6.1.2.1 the letter R shall be annotated in Item 10 (Equipment) of the flight plan to indicate that the aircraft meets the RNP type prescribed.

6.1.2.2 a target level of safety (TLS) of 5 x 10-9 fatal accidents per flight hour per dimension shall be established and the safety level of the airspace determined by an appropriate safety assessment.

Note 1.— Operators shall establish programmes to mitigate the occurrence of large lateral track error due to equipment malfunction or operational error, ensuring that operating drills include mandatory navigation cross-checking procedures to identify navigation errors in sufficient time to prevent aircraft inadvertently deviating from an ATC-cleared route; and to provide for the continued airworthiness of aircraft navigation systems necessary to navigate to the degree of accuracy required. Detailed guidance material on RNP is contained in the Manual on Required Navigation Performance (RNP) (Doc 9613).

Note 2.— Detailed guidance material on conducting safety assessments is contained in the Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689).

6.1.2.3 The following criteria is used in the operational assessment of airspace system safety:

a) the proportion of the total flight time spent by aircraft 46 km (25 NM) or more off the cleared track shall be less than 7.0 x 10-4; and

b) the proportion of the total flight time spent by aircraft between 74 and 111 km (40 and 60 NM) off the cleared track shall be less than 4.1 x 10 –5.

6.1.2.4 Adequate monitoring of flight operations shall be conducted to provide data to assist in the assessment of continuing compliance of aircraft with the lateral navigation performance capabilities of RNP 10 and 6.1.2 above. Such data shall include operational errors due to all causes. A safety assessment shall be carried out periodically, based on the data collected, to confirm that the safety level continues to be met.

Note.— Monitoring shall be conducted in accordance with appropriate guidance material. Detailed guidance material is contained in the Air Traffic Services Planning Manual (Doc 9426) and the Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689).

6.2 **Longitudinal separation**

(P-RAC, Part III — 8 and 9)

6.2.1 Except as provided for in 6.2.2, the minimum longitudinal separation between turbo-jet aircraft shall be:

a) 20 minutes, except as specified below:

b) 15 minutes at or above FL 250 within the Canarias, Dakar Oceanic, Sal Oceanic and Recife FIRs, provided that the Mach number technique is applied and, whether in level, climbing or descending flight, the aircraft have reported over the same entry point to the ATS routes or a common point into the oceanic-controlled airspace and follow the same track or continuously diverging tracks; or

c) 10 minutes or 149 km (80 NM), derived by RNAV, when the Mach number technique is applied on designated controlled oceanic routes in the EUR/SAM corridor within the Dakar Oceanic, Recife and Sal Oceanic FIRs.

6.2.2 For flights in the EUR/SAM corridor (Canarias (Southern sector), Dakar Oceanic, Recife and Sal Oceanic FIRs), the minimum longitudinal separation minima between RNAV-equipped aircraft approved to RNP 10 on the same track shall be 93 km (50 NM).

6.2.2.1 The letter R shall be annotated in Item 10 (Equipment) of the flight plan to indicate that the aircraft meets the RNP type prescribed.

6.2.2.2 A target level of safety (TLS) of 5 x 10-9 fatal accidents per flight hour per dimension shall be established and the safety level of such airspace shall be determined by an appropriate safety assessment.

6.2.2.3 Adequate monitoring of flight operations shall be conducted to provide data to assist in the assessment of continuing compliance of aircraft with the longitudinal navigation performance capabilities of RNP 10. Such data shall include operational errors due to all causes. A safety assessment shall be carried out periodically, based on the data collected, to confirm that the safety level continues to be met.

Note.— Detailed guidance materials contained in the Air Traffic Services Planning Manual (Doc 9426) and the Manual on Airspace Planning Methodology for the Determination of Separation Minima (Doc 9689).

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DRAFT PROPOSAL FOR AMENDMENT OF THE ICAO REGIONAL SUPPLEMENTARY PROCEDURES (DOC 7030)

The Implementation of RVSM in the EUR/SAM Corridor

(Serial No.: WACAF-S 00/3-AFI/SAM- RAC)

a) **Regional Supplementary Procedures:**

Doc 7030/4-AFI and SAM Part 1 — Rules of the Air, Air Traffic Services and Search and Rescue, up to and including Amendment 198. This amendment proposal has been developed within the framework of Informal Meetings on the Improvement of Air Traffic Services over the South Atlantic organized pursuant to AFI/7 RAN Meeting Recommendation 5/11 and as a follow-up to CAR/SAM/3 RAN Meeting Recommendation 5/26.

Note:— With the approval of the EUR/SAM corridor route network by the CAR/SAM/3 RAN Meeting, consequential editorial amendments to the AFI ANP will be carried out accordingly.

b) **Proposed Amendment:**

Amend the SUPPs applicable in the AFI and SAM Regions as follows:

Add the following requirements for Vertical separation under Section 6, paragraph 6. 3.

Note:— As a result of the inclusion of the proposed special procedures for in-flight contingencies under Chapter 4 in the AFI Part of the SUPPs, existing Sections 4 –13 have been amended to read 5 –14 accordingly)

(cf. Regional Supplementary Procedures, Doc 7030/4-AFI and SAM, Part 1 — Rules of the Air, Air Traffic Services and Search and Rescue, as amended by Amendment 198)

c) **Originated by:**

Brazil, Cape Verde, Senegal, Spain, IATA

d) **Originator's reason for amendment:**

The reduction in vertical separation will improve the provision of air traffic services in the areas concerned and is in line with the implementation strategy adopted in the AFI and SAM CNS/ATM implementation plans. In addition, it will allow Southbound traffic in the Canarias FIR at RVSM flight levels assigned under European RVSM operations to continue to operate under RVSM, thereby, improving ATC efficiency and airspace capacity.

e) **Intended date of implementation:**

As soon as practicable after approval by the Council of ICAO. Subject to all requirements being met, including safety assessment to verify that the target level of safety can be met, the implementation date will be on **24 January 2002** (*tentative date*).

f) **Proposal circulated to the following States and organizations:**

Algeria	Denmark	Luxemburg	Russian Federation
Argentina	Dominican	Mauritania	Senegal
Angola	Republic Ecuador	Mexico	South Africa
Austria	Egypt	Monaco	Spain
Belgium	France	Morocco	Suriname
Brazil	Germany	Namibia	Sweden Trinidad
Bulgaria	Ghana	Netherlands	United Kingdom
Canada	Haiti	Nigeria	United States Uruguay
Cape Verde	Hungary	Norway	Venezuela
Chile	Iceland	Paraguay	ASECNA
Colombia	Ireland	Poland	EUROCONTROL
Côte d'Ivoire	Italy	Portugal	IATA
Cuba	Jamaica	Romania	IFALPA

g) **Secretariat's comments:**

1. This proposal has been developed within the framework of Informal South Atlantic Coordination (SAT) Meetings and is in accordance with the AFI and SAM CNS/ATM implementation plans (AFI/7 Recommendation 5/11) and had been coordinated with the AFI Planning and Implementation Regional Group (APIRG) and the CAR/SAM Regional Planning and Implementation Group (GREPECAS).

2. Implementation of RVSM in the EUR/SAM corridor would enable aircraft operating to/from European RVSM airspace to continue under RVSM, thereby enhancing the efficiency of flight operations.

3. Following the successful implementation of RVSM in the NAT and Pacific Regions and in coordination with the European Region, RVSM is being introduced on designated routes within the EUR/SAM corridor.

4. The first phase of the implementation of RVSM in the EUR/SAM corridor will be on a phased basis to coincide with European implementation. The first phase will be on a single route within the EUR/SAM organized track system to facilitate traffic operating to/from European RVSM airspace, and will be extended to include other routes as experience is gained.

5. A monitoring agency will be established by Spain to monitor the safety of RVSM and RNP 10 operations.

Add the following requirement for vertical separation under Section 6, paragraph. 6.3:

6.3 **Vertical separation**

The minimum vertical separation that shall be applied between FL 290 and FL 410 inclusive is 300 m (1 000 ft).

6.3.1 **Area of applicability**

6.3.1.1 RVSM shall be applicable in the volume of airspace indicated at attachment A between FL290 and FL410 inclusive, in the flight information regions (FIRs): Canarias (Southern Sector), Dakar Oceanic, Sal Oceanic and Recife (Oceanic portions):

Note .—Implementation will be carried out in phases and will be promulgated by appropriate AIP Supplements and included in the respective AIPs.

6.3.1.2 *Establishment of 300 m (1 000 ft) vertical separation minimum (VSM) transition areas*

(A2 — Appendix 3; A6, Parts I and II, 7.2.3; A11— 3.3.4; P-RAC, Part III — 3.1)

6.3.1.2.1 In order to allow for the transition of flights to and from EUR/SAM RVSM airspace, the ATS authorities responsible for Canarias, Dakar Oceanic, Sal Oceanic and Recife FIRs may establish designated RVSM transition areas. A 300 m (1,000 ft) vertical separation minimum can be applied between RVSM approved aircraft within these transition areas.

6.3.1.2.2 An RVSM transition area shall have a vertical extent of FL 290 to FL 410 inclusive, be contained within horizontal dimensions determined by the provider States, be overlapping with or contained within EUR/SAM RVSM airspace and should have direct pilot-controller communications.

6.3.2 *RVSM approval*

6.3.2.1 The minimum separation in 6.3 shall only be applied between aircraft and operators that have been approved by the State of Registry or the State of the Operator, as appropriate, to conduct flights in RVSM airspace and that are capable of meeting the minimum aircraft system performance specification (MASPS) height-keeping requirements (or equivalent).

6.3.3 *MASPS*

6.3.3.1 The MASPS height-keeping requirements are as follows:

a) for all aircraft, the differences between cleared flight level and the pressure altitude actually flown shall by symmetric about a mean of 0 m (0 ft), shall have a standard deviation no greater than 13 m (43 ft) and shall be such that the error frequency decreases with increasing magnitude at a rate which is at least exponential;

b) for groups of aircraft that are nominally of identical design and build with respect to all details that could influence the accuracy of height-keeping performance in the RVSM flight envelope (FL 290 to FL 410 inclusive):

   1) the mean altimetry system error (ASE) of the group shall not exceed 25 m (80 ft) in magnitude; and

   2) the sum of the absolute value of the mean ASE and of three standard deviations of ASE shall not exceed 75 m (245 ft);

c) for non-group aircraft for which the characteristics of the airframe and altimetry system fit are unique and so cannot be classified as belonging to a group of aircraft: the ASE shall not exceed 61 m (200 ft) in magnitude in the RVSM flight envelope (FL 290 to FL 410 inclusive); and

d) the following criteria shall be used in the operational assessment of airspace system safety: the total vertical error (TVE), which is the difference between the geometric height of the aircraft and the geometric height of the flight level to which it is assigned, is required to be such that:

1) the probability that TVE equal to or greater than 91 m (300 ft) in magnitude is equal to or less than 2.0 x 10-3;

2) the probability that TVE equal to or greater than 152 m (500 ft) in magnitude is equal to or less than 5.0 x 10-6;

3) the probability that TVE equal to or greater than 200 m (650 ft) in magnitude is equal to or less than 1.4 x 10-6;

4) the probability that TVE between 290 m and 320 m (950 ft and 1 050 ft), inclusive, in magnitude is equal to or less than 1.7 x 10-7; and

5) the proportion of time that aircraft spend at incorrect flight levels, 300 m (1 000 ft), or multiples thereof, away from assigned flight levels is equal to or less than 7.1 x 10-7.

Note.– Guidance material regarding the initial achievement and continued maintenance of the height-keeping performance in 6.3.3.1 is contained in the Guidance Material on the Implementation of a 300 m (1000 ft) Vertical Separation Minimum (VSM) for Application in the EUR/SAM Corridor.

6.3 4 *Target level of safety (TLS)*

6.3.4.1 Application of RVSM in the airspace designated in 6.3.1.1 shall meet a TLS of 5 x 10-9 fatal accidents per aircraft flight hour due to all causes of risk in the vertical dimension.

6.3.5 *Approval status and aircraft registration*

6.3.5.1 Item 10 of the flight plan (Equipment) shall be annotated with the letter W if the aircraft and operator have received RVSM State approval. Furthermore, the aircraft registration shall be indicated in Item 18 of the flight plan.

6.3.6 *Operation of aircraft not approved for RVSM*

6.3.6.1 Except for areas where transition areas have been established, aircraft not meeting the requirements of 6.3.3.1 shall not be allowed to operate in EUR/SAM RVSM airspace.

6.3.6.2 Exceptionally, aircraft that have not received RVSM State approval may be cleared to operate in airspace where RVSM may be applied in accordance with policy and procedures established by the State provided that 600 m (2000 ft) vertical separation is applied.

Note.-Transitions to and from EUR/SAM RVSM *airspace will normally take place in the first FIR in EUR/SAM RVSM airspace.*

6.3.7 *Monitoring*

6.3.7.1 Adequate monitoring of flight operations in the EUR/SAM RVSM airspace shall be conducted to assist in the assessment of continuing compliance of aircraft with the height-keeping capabilities in 6.3.3.1. Monitoring shall include assessment of other sources of risk to ensure that the TLS specified in 6.3.4.1 is not exceeded.

Note.— Details of the policy and procedures for monitoring established by the South Atlantic Monitoring agency (SATMA) are contained in the Guidance Material on the Implementation of a 300m (1 000 ft) Vertical Separation Minimum (VSM) for Application in the EUR/SAM Corridor.

6.3.8 *Wake turbulence procedures*

6.3.8.1 The following special procedures are applicable to mitigate wake turbulence encounters in the airspace where RVSM is applied.

6.3.8.1.1 An aircraft that encounters wake turbulence should notify air traffic control (ATC) and request a revised clearance. However, in situations where a revised clearance is not possible or practicable:

a) the pilot should establish contact with other aircraft, if possible, on the appropriate VHF inter-pilot air-to-air frequency; and

b) one (or both) aircraft may initiate lateral offset(s) not to exceed 2 NM from the assigned route(s) or track(s), provided that:

1) as soon as it is practicable to do so, the offsetting aircraft notify ATC that temporary lateral offset action has been taken and specify the reason for doing so; and

2) the offsetting aircraft notify ATC when re-established on assigned route(s) or track(s).

Note.– In the contingency circumstances above, ATC will not issue clearances for lateral offsets and will not normally respond to action taken by pilots.

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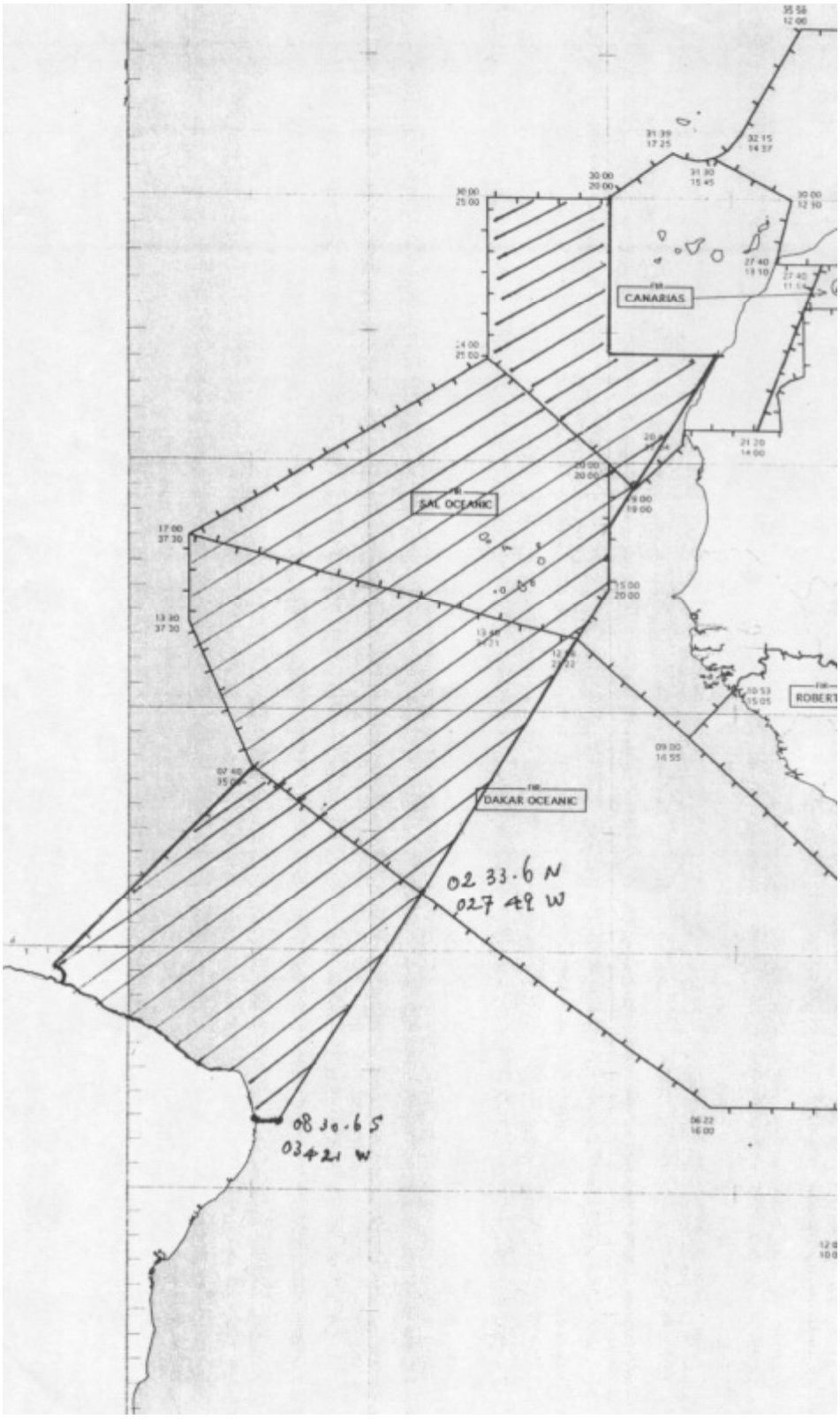
Attachment A

LIMITS OF THE EUR/SAM CORRIDOR RVSM AREAS

From **25° 00’ N/ 15°30’ W**; 19° 00‘ N/ 19° 00’ W ; 17° 20’ N/ 20° 00’ W
15° 00’ N/ 20° 00’ W; 12° 58’ N/ 21° 22’ W ; 08° 30.6’ S/ 34°21’ W
08° 08.2’ S / 34° 55.6’ W (Recife VOR) then follow the Northern continental limits of Brazil until the point 01°20.7’ S/43°07.5’ W ;
07° 40’N/ 3 5° 00’ W ; 13°30’N/ 37° 30’ W ; 17° 00’ N/ 37° 30’ W ;
24° 00’N/ 25° 00’ W ; 30°00’ N/ 25°00’W ; 30° 00’ N/ 20° 00’W
25° 00’ N/ 20° 00’W ; **25° 00’N/ 15°30’W**


CANARIAS
SAL OCEANIC
DAKAR OCEANIC
02 33.6 N
027 48 W
08 30.6 S
034 21 W

TIME SCALES FOR THE IMPLEMENTATION OF RVSM
EUR/SAM CORRIDOR RVSM Program

SAT GROUP

Spain was committed by SAT Group to establish a Monitoring Agency and to carry out the Pre-implementation Safety Assessment.

SAT GROUP	END DATE	REV END DATE	IMPACT	RECOMMENDATION/ COMMENT
Monitoring Infrastructure				
Set Up Monitoring Agency	23/08/00			
Safety Assessment				
Conduct Pre-implementation Safety Assessment	15/06/00			Contract between Spain and ARINC is on going.
Produce final Pre-Implementation Report assessing each Safety Objective	15/12/00			
Monitoring Operations				
Produce height keeping and non height keeping results for safety case	TBD			To be carried out by Spain.
GO/DELAY Decision				
Decide Go/Delay implementation	15/09/01			

ICAO

ICAO are responsible for providing a framework for enabling the introduction of National regulations needed to be in place for the introduction of RVSM.

ICAO	END DATE	REV END DATE	IMPACT	RECOMMENDATION/ COMMENT
Develop EUR/SAM CORRIDOR RVSM Guidance Material	OK			Complete
Approve and issue RVSM Technical and Operational Amendment to Doc 7030	23/11/00			

RVSM STATES

State organizations identified as separate Stakeholders include National Civil Aviation Authority, Certification/Regulation Authorities and ATS Providers. Together they are responsible for the provision of regulations to enable ATCs to safely handle aircraft flying in RVSM airspace, as well as approving National users for RVSM operations.

RVSM STATES	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
NATIONAL CIVIL AVIATION AUTHORITIES				
Programme Management				
Establish National RVSM programme organization and budget	23/07/00		Lack of commitment to programme could mean delay in required activities.	
Awareness				
Launch National RVSM awareness programme	23/07/00			
Aeronautical Publications				
RVSM NOTAM	10/07/00		Lack of communication with aviation community and lack of preparation in aviation community.	
Publish RVSM Aeronautical Information Circulars	First AIC: 10/07/00		Lack of communication with aviation community and lack of preparation in aviation community.	
E**UR/SAM Corridor Generic RVSM ATC Procedures**				
Agree operational and technical Doc 7030 amendment on National level	Ok			
Legal Issues				
Implement National Legislation/Regulations	23/01/01			
STATE CERTIFICATION/REGULATORY AUTHORITIES	**TARGET DATE**	**REV TARGET DATE**	**IMPACT**	**RECOMMENDATION/ COMMENT**
RVSM Approval				
Launch assessment of RVSM Approval Rate	23/08/00			
Adopt Technical Doc 7030 into National regulations	23/01/01			
Provide certification criteria to National Operators	23/01/01			
Approve suitably modified aircraft	30/05/01			

RVSM aircraft certification	End March 2001			The South Atlantic Monitoring Agency (SATMA) will be in charge to collect data Go/delay implementation decision depends on 90% aircraft certification rate

STATE ATS PROVIDER	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
Training Simulator Modifications				
Establish Simulator Modification Schedule	23/08/00			
Validate and accept simulator modifications	23/10/00			
ATS System Modifications				
Establish ATS System modification schedule	23/08/00			
Validate and accept system modifications	23/11/00			
ATC Procedures				
Adapt/Integrate RVSM ATC procedures in National local Ops Manual	23/01/01			
Preparation of Airspace				
Agree on National Airspace Structure and sectorization changes	23/01/01			
Letters of Agreement				
Completion of all Letters of Agreement amendments	31/8/01			
Integrate Letters of Agreement amendments into local ATC Ops Manual	01/11/01			
Controller Training for RVSM				
Finalize National local training programme	9/11/00			
Complete National ATC training	30/11/01			
Implement RVSM	24/01/02			

NON-RVSM STATES

Non-RVSM States are responsible for certifying aircraft requiring access to RVSM airspace. In addition, Non-RVSM States adjacent to the RVSM area may require airspace and procedure modifications to handle transition between RVSM airspace and non-RVSM airspace.

NON-RVSM STATES	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
RVSM Approval				
Translate Technical Doc 7030 into National regulations	23/01/01			
Provide certification criteria to National Operators	23/01/01			
Approve suitably modified aircraft	30/05/01			
Monitor approval rate of National aircraft modifications	27/8/01			The South Atlantic Monitoring Agency (SATMA) will be in charge to collect data Go or not go implementation decision depends on 90% aircraft certification rate

CIVIL AIRSPACE USERS

Users wishing to fly in RVSM airspace must gain RVSM approval. Taking in consideration that most of the Civil Airspace users in the EUR/SAM corridor goes to or comes from Europe, the EUR/SAM corridor RVSM program will use the same dates used for European RVSM Program.

CIVIL AIRSPACE USERS	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
Aircraft Modifications				
Identify modification requirements	31/5/00			Date reflects agency's ability to collect date from the Operators. All dates now aligned with the monitoring programme.
Set up modification programme	31/12/00			Date reflects agency's ability to collect date from the Operators. All dates now aligned with the monitoring programme.
Develop Amendments to Ops Manual	30/3/01			Date reflects agency's ability to collect date from the Operators. All dates now aligned with the monitoring programme.
Undertake aircraft modifications	29/12/00			
RVSM Approval				
Commence participation in European RVSM monitoring program	25/5/00			
Request RVSM certification	19/3/01			
Deadline for RVSM certification	End Mar/01			
Flight Crew Training				
Conduct flight crew training	10/10/01			

APPENDIX C-2

TIME SCALES FOR THE IMPLEMENTATION OF RNP 10

EUR/SAM CORRIDOR RNP-10 Program

SAT GROUP

Spain was committed by SAT Group to establish a Monitoring Agency and to carry out the Pre-implementation Safety Assessment.

ICAO	END DATE	REV END DATE	IMPACT	RECOMMENDATION/ COMMENT
Monitoring Infrastructure				
Set Up Monitoring Agency	23/08/00			
Safety Assessment				
Conduct Pre-implementation Safety Assessment	15/06/00			
Produce final Pre-Implementation Report assessing each Safety Objective	15/12/00			
GO/DELAY Decision				
Decide Go/Delay implementation	17/02/01			

ICAO

ICAO are responsible for providing a framework for enabling the introduction of National regulations needed to be in place for the introduction of RNP-10.

ICAO	END DATE	REV END DATE	IMPACT	RECOMMENDATION/ COMMENT
Approve and issue AFI RNP-10 Technical and Operational Amendment to Doc 7030	23/11/00			RNP-10 for the SAM Region was approved during RAN CAR/SAM 3 meeting.

RNP-10 STATES

State organizations identified as separate Stakeholders include National Civil Aviation Authority, Certification/Regulation Authorities and ATS Providers. Together they are responsible for the provision of regulations to enable ATCs to safely handle aircraft flying in RNP-10 airspace, as well as approving National users for RNP-10 operations.

RNP-10 STATES	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
NATIONAL CIVIL AVIATION AUTHORITIES				
Programme Management				
Establish National RNP-10 programme organization and budget	23/07/00		Lack of commitment to programme could mean delay in required activities.	
Awareness				
Launch National RNP-10 awareness programme	23/07/00			
Aeronautical Publications				
RNP-10 NOTAM	10/07/00		Lack of communication with aviation community and lack of preparation in aviation community.	
Publish RNP-10 Aeronautical Information Circulars	First AIC: 10/07/00		Lack of communication with aviation community and lack of preparation in aviation community.	
EUR/SAM Corridor Generic RNP-10 ATC Procedures				
Agree operational and technical Doc 7030 amendment on National level	ok			
Legal Issues				
Implement National Legislation/Regulations	23/01/01			

STATE CERTIFICATION/REGULATORY AUTHORITIES	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
RNP-10 Approval				
Launch assessment of RNP-10 Approval Rate	23/08/00			
Adopt Technical Doc 7030 into National regulations	23/01/01			
Provide approval criteria to National Operators	17/09/00			Complete for some States.
RNP-10 aircraft approval	17/02/01			The South Atlantic Monitoring Agency (SATMA) will be in charge to collect data Go or not go implementation decision depends on 90% aircraft certification rate

STATE ATS PROVIDER	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
Training Simulator Modifications				
Simulator modification	23/08/00			
ATS System Modifications				
ATS System modification	23/08/00			
Preparation of Airspace				
National Airspace Structure and sectorisation changes	23/01/01			
Letters of Agreement				
Completion of all Letters of Agreement amendments	SAT/9 Meeting (6-10 Nov 2000)	SAT/9 TF		
Integrate Letters of Agreement amendments into local ATC Ops manual	10/12/00			
Controller Training for RNP-10				
Finalize National local training programme	10/11/00			
Complete National ATC training	17/02/01			
Implement RNP-10	19/04/01			

NON-RNP-10 STATES

Non-RNP-10 States are responsible for certifying aircraft requiring access to RNP-10 airspace. In addition, Non-RNP-10 States adjacent to the RNP-10 area may require airspace and procedure modifications to handle transition between RNP-10 airspace and non-RNP-10 airspace.

NON-RNP-10 STATES	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
RNP-10 Approval				
Translate Technical Doc 7030 into National regulations	23/01/01			
Provide approval criteria to National Operators	17/09/00			
Monitor approval rate of National aircraft	17/02/01			The South Atlantic Monitoring Agency (SATMA) will be in charge to collect data Go or not go implementation decision depends on 90% aircraft certification rate.

CIVIL AIRSPACE USERS

Users wishing to fly in RNP-10 airspace must gain RNP-10 approval.

CIVIL AIRSPACE USERS	TARGET DATE	REV TARGET DATE	IMPACT	RECOMMENDATION/ COMMENT
Aircraft Modifications				
Develop Amendments to Ops Manual	10/09/00		.	
RNP-10 Approval				
Request RNP-10 approval	10/10/00			
Deadline for RNP-10 approval	End Jan/01			
Flight Crew Training				
Conduct flight crew training	10/01/01			.

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LIST OF PARTICIPANTS

ARGENTINA

1. Guillermo Cocchi
Jefe de División Espacios, Rutas y Sistemas de Navegación Aérea, Dirección de Tránsito Aéreo
Comando de Regiones Aéreas
Edificio Cóndor, Oficina 169, Sector Verde
Av. Pedro Zanni 250
Buenos Aires 1104, Argentina
Tel: (5411) 4317-6408
Fax: (5411) 4317-6502
E-Mail: ditraer@faa.mil.ar

2. Gustavo Chiri
Asesor, Comando de Regiones Aéreas
Dirección de Comunicaciones
Edificio Cóndor, Oficina 178, Sector Verde
Av. Pedro Zanni 250
Buenos Aires 1104, Argentina
Tel: (5411) 4317-6466
Fax: (5411) 4317-6322
E-Mail: chirig@infovia.com.ar

3. Eduardo Rodino
Asesor, Comando de Regiones Aéreas
Dirección de Tránsito Aéreo
Edificio Cóndor, Oficina 1064, Sector Verde
Av. Pedro Zanni 250
Buenos Aires 1104, Argentina
Tel: (5411) 4317-6307
Fax: (5411) 4317-6307
E-Mail: ditraer@faa.mil.ar
E-Mail2: erodino@infovia.com.ar

BRAZIL

4. José Canelas Guilherme da Silva
Jefe División ATM
Directoría de Electrónica y Protección al Vuelo (DEPV)
Av. Gral. Justo No. 160 A-2º andar
Castelo – Río de Janeiro - RJ
CEP 20021-130, Brasil
Tel: (5521) 814-6273 / 220-6127
Fax: (5521) 220-0565
E-Mail: datm.depv@maerj.gov.br
E-Mail2: gme@csp.org.br

5. Dalmo José Braga Paim
Jefe de la Sección COM
Dirección de Electrónica y Protección al Vuelo (DEPV)
R. Prof. Aurelio C. Cavalcanti 181/103 B. Viagem
Recife, CEP 51210-020, Brasil
Tel: (5581) 461-8180
Fax: (5581) 461-8152
E-Mail: paim2000@zipmail.com.br
E-Mail2: dacta3is@truenet.com.br

6.	Julio César de Souza Pereira Jefe de la Sección de Planeamiento de ATM Directoría de Electrónica y Protección al Vuelo (DEPV) Av. General Justo 160, 2º andar, Castelo, Río de Janeiro RJ-20021-030, Brasil	Tel: Fax: E-Mail:	(5521) 814-6274 / 814-6277 (5521) 220-0565 julioval@uol.com.br

CAPE VERDE

7.	José Emanuel Rodrígues Director de Navegación Aérea ASA, E.P. Air Navigation Direction Aeroporto International A. Cabral La Sal, Cape Verde	Tel: Fax: E-Mail:	(238) 411-372 (238) 411-323 dna@asa.cv
8.	Sabino Baptista Director de Telecomunicaciones ASA, Sal – Espargos La Sal, Espargos, Cape Verde	Tel: Fax: E-Mail:	(238) 411-372 (238) 411-323 dta@asa.cv

FRANCE

9.	Thibaud Reille Airsys ATM 19 Rue de la Fontaine 92221 Bagneux Cedex, France	Tel: Fax: E-Mail:	(331) 4084-1194 (331) 4084-1349 thibaud.reille@airsysatm.thomson-caf.com

PERÚ

10.	Víctor Palacios Ayllon Jefe del Área de Proyectos Especiales CORPAC, S.A. P. O. Box 680 Lima 100, Perú	Tel: Fax: E-Mail:	(511) 484-0643 (511) 484-0643 vpalacios@corpac.gob.pe
11.	Miguel Ramírez Castro Inspector de Operaciones, Aeronavegación DGAC Perú Av. 28 de Julio No. 800 Lima 1, Perú	Tel: Fax: E-Mail:	511-4330273, 4337800 Ex.453 511-4339823 inspectores@mtc.gob.pe

SENEGAL

12.	Madior Diack ASECNA Representative in Senegal Chief Delegate BP 8056 Dakar, Senegal	Tel: Fax: E-Mail: AFTN:	(221) 820-0277 (221) 820-0600 asecnago2@sentoo.ar GOOYYKYX
13.	Akakpo Ayikoe Joachim ATM Manager ASECNA BP 8108, Airport Dakar, Senegal	Tel: Fax: AFTN: E-Mail:	 (221) 820-0656 GOOYKEN
14.	Ndiaye Issa Air Traffic Control Supervisor ASECNA BP 8108, Airport Dakar, Senegal	Tel: Fax: E-Mail: AFTN:	(221) 820-1041 (221) 820-0656 asecnagoca@sentoo.sn GOOYYKEN GOOOZQZX

SOUTH AFRICA

15.	Harry Roberts Operational Research Specialist ATNS South Africa Private Bag X15 Johannesburg Intl. Airport South Africa 1627	Tel: Fax: E-Mail:	(27) 119610208 (27) 113923946 harryr@atns.co.za
16.	Kobus Jacobs ATNS, Chief, Johannesburg Area Persanbag XI, Bonaeropark	Tel: Fax: E-Mail:	(2711) 928-6526 (2711) 395-1045 kobusj@atns.co.za

SPAIN

17.	Tomás Vidriales ATC Activities Responsible AENA/DRNA Canarias Km. 15.5 GC1 Telde 35219 Las Palmas, Canarias, Spain	Tel: Fax: E-Mail:	(34) 928 577-054 (34) 928 577-052 tvidriales@aena.es

18.	Ramón Pérez Parada ATC Operational Support AENA/DRNA Canarias Km. 15.5 GC1 Telde 35219 Las Palmas, Canarias, Spain	Tel: Fax: E-Mail:	(34) 928 577-057 (34) 928 577-052 rpparada@aena.es
19.	Antonio Arias Febles ACC Technical Responsible AENA/DRNA Canarias Las Palmas de Gran Canaria España	Tel: Fax: E-Mail:	(3492) 8577-111 (3492) 8577-104 aariasf@aena.es
20.	Francisco Mesa Domenech Ministerio de Defensa Cuartel General del Aire EMA/DOP/SESPA c/. Romero Robledo No. 8 Madrid, España 28071	Tel: Fax: E-Mail:	(341) 549-0700 (341) 549-5363
21.	Carlos San José Martin Ministerio de Defensa Cuartel General del Mando Aéreo de Canarias Las Palmas de Gran Canaria España 35004	Tel: Fax: E-Mail:	(3492) 824-0918
22.	Pablo Hernández Coronado Quintero Ministerio de Fomento DGAC/SGSNAA C/Pso Castellana 67 Madrid 28071, España	Tel: Fax: E-Mail:	(34) 928-240918 (3491) 597-8514 phernandez@mfom.es
23.	Juan de Mata Morales División de Gestión Internacional, AENA C/Juan Ignacio Luca de Tena 14 28027, Madrid, España	Tel: Fax: E-Mail:	3491-3213122 3491-3213119 jdemmorales@aena.es
24.	José Manuel Puente DGAC/SGSNAA Paseo Castellana, 67 28071, Madrid, España	Tel: Fax: E-Mail:	(3491) 597-5381 (3491) 597-8514 jmpuente@mfom.es
25.	Rafael Luna INDRA Ctra de Loeclef 9 28850 Torre /n de Ardre, Madrid, Spain	Tel: Fax: E-Mail:	(3491) 396-8100 (3491) 656-5887 rluna@indra.es
26.	Isaac Domínguez INSA C/Orense 4 Planta 9 28020 Madrid, Spain	Tel: Fax: E-Mail:	(3491) 556-1418 (3491) 597-2181 idominguez@insa.org

27.	Miguel Angel López García Delegado por España INDRA SISTEMAS Av. Paz Soldán 170, Of. 702 San Isidro, Lima, Perú	Tel: Tel: Fax: E-Mail:	(511) 221-1218 (Lima) (5491) 396-8100 (España) malogarcia@indra.es

UNITED STATES

28.	Daniel Vaca Jr. ATS International Programme Officer FAA Washington DC USA	Tel: Fax: E-Mail	(202) 267-3317 (202) 267-5120 Daniel.vaca@faa.gov
29.	Brian Throop Operations Officer ATS Oceanic Procedures Branch FAA, Washington, DC **USA**	Tel: Fax: E-Mail	(202) 267-3160 (202) 267-5110 brian.throop@faa.gov
30.	Allan Storm Civil/Military Aviation Issues U.S. Air Force Flight Standards Agency 1535 Command Dr., Suite D309 Andrews AFB, Maryland 20762-7002 **USA**	Tel: Fax: E-Mail	(240) 857-2146 (240) 857-3194 allan.storm@andrews.af.mil

URUGUAY

31.	Alfredo Tardáguila Director de Tránsito Aéreo División Tránsito Aéreo, DGIA Aeropuerto Internacional de Carrasco Uruguay	Tel: Fax: E-Mail:	(5982) 604-0251 (5982) 601-4514 dtaereo@adinet.com.uy

ARINC

32.	Michael Ramírez Director Regional ARINC Para Latinoamérica 2551 Riva Rd. Annapolis, MD USA 21401	Tel: Fax: E-Mail:	(954) 349 0748 (954) 349 8762 mramirez@arinc.com

33.	Demetrius Zuidema Director of Marketing ARINC 2551 Riva Rd. Annapolis, MD USA 21401	Tel: Fax: E-Mail:	954-447-9896 954-447-8583 dzuidema@arinc.com
34.	Edward Lutz ARINC Principal Engineer, ARINC RVSM Programs 2551 Riva Rd. Annapolis, MD USA 21401	Tel: Fax: E-Mail:	(410) 266-4446 (410) 573-3106 ejl@arinc.com

ASECNA

35.	Théodore-Marie Fokoua ASECNA – Direction Générale Chief Department Air Navigation B.P. 3144 Dakar, Senegal	Tel: Fax: E-Mail:	(221) 8231711/6386335/8496633 (221) 8235463 fokouatm@telecomplus.sn

IATA

36.	José F Carvalho Director Operations, Africa IATA Box 47979 Nairobi, Kenya	Tel: Fax: E-Mail: Sitatex AFTN	(2542) 723999 (2542) 723978 carvalhoj@iata.org NBOERXB HKNAIATX
37.	Juan Ignacio Serrano Alonso-Villalobos External Relations Flight Operations, DC-10 Pilot IBERIA A.Z.I. No. 1 Barajas Airport 28042 Madrid, España	Tel: Fax: E-Mail: E-Mail2:	(3491) 587-4018 / 4033 (3491) 587-4014 doce@iberia.es jiserrano@eresmas.com
38.	Celio González Villalba External Relations Flight Operations, B-747 Pilot IBERIA A.Z.I. No. 1 Barajas Airport 28042 Madrid, España	Tel: Fax: E-Mail:	(3491) 657-1156 celiosi@arrakis.es

ICAO

39.	Dhiraj Ramdoyal RO/ATM ICAO WACAF Office P. O. Box 2356 Dakar, Senegal	Tel: Fax: E-Mail:	(221) 839-9390 (221) 823-6926 ramdoyal@telecomplus.sn
40.	Paulo Imre Hegedus Regional Director ICAO SAM Regional Office P. O. Box 4127 Lima 100, Perú	Tel: Fax: E-Mail: AFTN: Sitatex	(511) 575-1646 / 575-1476 (511) 575-0974 / 575-1479 pih@lima.icao.int SPIMICOX LIMCAYA
41.	Carlos Stehli RO/CNS ICAO SAM Regional Office P. O. Box 4127 Lima 100, Perú	Tel: Fax: E-Mail: AFTN: Sitatex	(511) 575-1646 / 575-1476 (511) 575-0974 / 575-1479 cs@lima.icao.int SPIMICOX LIMCAYA
42.	Onofrio Smarrelli RO/CNS ICAO SAM Regional Office P. O. Box 4127 Lima 100, Perú	Tel: Fax: E-Mail: AFTN: Sitatex	(511) 575-1646 / 575-1476 (511) 575-0974 / 575-1479 os@lima.icao.int SPIMICOX LIMCAYA
43.	Miguel Liñán Arcas International Coordinator RLA/98/019 Project ICAO SAM Regional Office P. O. Box 4127 Lima 100, Perú	Tel: Fax: E-Mail: AFTN: Sitatex	(511) 575-1646 / 575-1476 (511) 575-0974 / 575-1479 ml@lima.icao.int SPIMICOX LIMCAYA
44.	Tomás Sheen ICAO Mission Chief PER/91/018 ICAO SAM Regional Office P. O. Box 4127 Lima 100, Perú	Tel: Fax: E-Mail:	(511) 575-2124 (511) 575-0974 / 575-1479 peroaci@amauta.rcp.net.pe
45.	Jorge Fernández Demarco RO/ATM/SAR ICAO SAM Regional Office P. O. Box 4127 Lima 100, Perú	Tel: Fax: E-Mail: AFTN: Sitatex:	(511) 575-1646 /575-1476 (511) 575-0974 / 575-1479 jf@lima.icao.int SPIMICOX LIMCAYA

46. Gustavo De León
RO/ATM/SAR, México
ICAO NACC Offfice
Presidente Masaryk 29 – 3rd. Floor
Col. Chapultepec Morales,
11570 México, D.F., México

Tel: (525) 250-3211
Fax: (525) 203-2757
E-Mail: gdeleon@mexico.icao.int
AFTN: MMMXICOX
Sitatex MEXCAYA