

Agenda Item 3: Report of the results achieved through the program of project activities during 2003

3.1 At the beginning of this agenda item, the meeting reviewed the program of activities approved for 2003, which is shown hereunder, and evaluated its implementation.

- (1) Finalization and distribution of the document "Guidance Material towards the ICAO Global ATM evolution in the CAR/SAM Regions".
- (2) Fine tuning of the CNS/ATM PET (Planning and evaluation Tools) and Communications Lists 1, 2 and 3.
- (3) Visits to States.
- (4) Second Seminar on RVSM Implementation in the CAR/SAM Regions, (Panama City, Panama, 16 and 17 June 2003).
- (5) Fifth Meeting/workshop of Air Traffic Management authorities and planners for RVSM, RNAV routes and RNP implementation in the CAR/SAM Regions (AP/ATM/5 RVSM-RNAV-RNP) (Panama City, Panama, 18 to 20 June 2003).
- (6) Sixth Meeting/workshop of Air Traffic Management authorities and planners for RVSM, RNAV routes and RNP implementation in the CAR/SAM Regions (AP/ATM/6 RVSM-RNAV-RNP) (27 – 31 October 2003, place to be determined).
- (7) CNS/ATM Seminar on Human Resources and Training (Cartagena de Indias, Colombia, from 19 to 23 May 2003, tentatively).
- (8) Seminar on future air navigation systems automation (one week in Lima, Peru, in November 2003).
- (9) Seminar/workshop on WGS-84 vertical data (Rio de Janeiro, Brazil, from 2 – 4 December 2003).

3.2 Activities completed**3.2.1 Report of Activities 1 and 2 of tentative program for 2003**

3.2.1.1 The "Guidance Material towards the ICAO Global ATM evolution in the CAR/SAM Regions" has been completed, but as a result of the Eleventh Air Navigation Conference it will need to be updated to accurately reflect the new orientation. The modified version is planned to be distributed starting 2004.

3.2.1.2 The CNS/ATM PET (CNS/ATM Planning and Evaluation Tools) has been finalized and distributed to CAR and SAM States. It includes the documentation, the software model with the

complete database of nav aids for the CAR/SAM Regions, as well as another version including only the national database of the State concerned. It should be noted that the model could operate any simulation using the “base-cost-line” approach. Likewise, the model is open and can be modified to be used in specific conditions.

3.2.1.3 Communications Lists 1, 2 and 3 has been completed including frequency search routines.

3.2.1.4 For the development of these activities, a CNS expert and a Software Specialist were contracted, the cost for the project including experts salaries, support of the ATM expert and the project’s secretary, plus ICAO and UNDP’s administrative costs was of **USD 29,930.00**, approximately.

3.3 **Visits to States** (*Activity 3 of the tentative program for 2003*)

3.3.1 The Team of Project RLA/98/003 (Messrs. **P. Hegedus**, Institutional Aspects expert, **J. Moreno**, ATM expert and **N. Ostiguy**, CNS expert) carried out visits to the States as part of Task No. 3 of the tentative work program for 2003. **Appendix A** presents more details concerning these visits.

3.3.2 The States involved in the first part of the visits were:

- Bolivia - 17 – 18 August 2003
- Colombia - 24 – 26 August 2003
- Ecuador - 27 – 29 August 2003
- Panama - 30 August – 02 September 2003
- Honduras - 03 – 05 September 2003
- (COCESNA)
- Venezuela - 06 – 10 September 2003

3.3.3 The cost of this activity including experts’ salaries, DSA, air tickets, travel expenses and projects’ secretary support was of **US\$50,800.00** approximately.

3.4 **Second Seminar on RVSM Implementation in the CAR/SAM Regions, (Panama City, Panama, 16 and 17 June 2003)** (*Activity 4 of the tentative program for 2003*)

3.4.1 This seminar was successfully carried out and had as main objective the provision of general information on RVSM Implementation to Civil Aviation Administrations, ATS Services Providers and to commercial, general and military aviation operators of the CAR/SAM Regions, emphasizing the approval requirements for airworthiness and operations; as well as in height keeping performance for RVSM approval by the corresponding authority, in order to ensure the achievement of an acceptable safety level of the system in the RVSM airspace of both regions.

3.4.2 Among other matters, the following issues were discussed: the approval process of aircraft and operators, aspects related to safety assessment, Monitoring Agency; as well as Operational, Air Traffic Management and Training considerations.

3.4.3 Speakers from wide and recognized experience in the RVSM implementation process from the Federal Aviation Administration (FAA) of the United States, from the SAM Region, IATA, IFALPA, IFATCA and from the aeronautical industry attended this seminar. Ten States from the CAR Region, thirteen States from the SAM Region and six International Organizations: Aeromech Inc., AITAL,

ARINC, COCESNA, IATA, IFALPA, and IFATCA, participated in this seminar, totaling 135 participants.

3.5 Fifth Meeting/workshop of Air Traffic Management authorities and planners for RVSM, RNAV routes and RNP implementation in the CAR/SAM Regions (AP/ATM/5 RVSM-RNAV-RNP) (Panama City, Panama, from 18 to 20 June 2003)
(Activity 5 of the tentative program for 2003)

3.5.1 Ten States from the CAR Region, thirteen States from the SAM Region and six International Organizations, AITAL, ARINC, COCESNA, IATA, IFALPA and IFATCA, participated in this meeting/workshop, totaling 79 participants.

3.5.2 The most relevant aspects discussed during his meeting were:

➤ **Agenda Item 1 Review of the RNAV routes Implementation Programme**

The inclusion of 14 new RNAV routes, the realignment and/or extension of 9 existing routes and the deletion of 7 routes of the CAR/SAM Regional Air Navigation Plan (ANP) was proposed. The ICAO Secretariat has already initiated the corresponding amendment process. The implementation will be made, at least, three AIRAC cycles after the amendment approval by the ICAO Council.

➤ **Agenda Item 2 Review of the Action Plan for RNP 10 Pre-Operational Implementation in parallel routes UL 780 and UL 302 in the Santiago de Chile-Lima segment**

The CAR/SAM Monitoring Agency (CARSAMMA) previously informed that, based on the data collected by Chile and Peru, the surveys on airspace safety assessment indicated that there were no major problems for RNP 10 pre-operational implementation in the Santiago de Chile-Lima segment of parallel routes UL 780 and UL 302. For which both States decided to continue with the Action Plan for the referred implementation, foreseen for 22 January 2004.

➤ **Agenda Item 3 Review of the CAR/SAM RNP Application Strategy**

Considering that the ATS Routes Network of the CAR/SAM Regions is not yet established, it was agreed that the RNAV/RNP Task Force continues with the studies for the establishment of an RNP application strategy.

➤ **Agenda Item 4 Review of the issues related with RVSM Implementation in the CAR/SAM Regions**

The most relevant conclusions approved were, among others, the following:

- *ATC RVSM Simulations*
- *Flight Level Allocation System (FLAS)*
- *RVSM Operational and Contingency Procedures*
- *Non-implementation of Transition Areas*

- *RVSM ATS status in the CAR/SAM Regions*
- *RVSM readiness assessment*
- *Updating of the Cost/Benefit Analysis*
- *New traffic data collection: 1-30 September 2003*

3.5.3 The cost of this activity for RLA/98/003 project, including experts, support of the ATM project expert, administrative support, air tickets, DSA, simultaneous interpretation and miscellaneous was of US\$ 77,620.00 approximately.

3.6 **Sixth Meeting/workshop of Air Traffic Management authorities and planners for RVSM, RNAV routes and RNP implementation in the CAR/SAM Regions (AP/ATM/6 RVSM-RNAV-RNP) (San Jose, Costa Rica, from 29 September to 3 October 2003)**
(Activity 6 of the tentative program for 2003)

3.6.1 Nine States from the CAR Region, thirteen States from the SAM Region and five International Organizations, ARINC, COCESNA, IATA, IFALPA and IFATCA, participated in this meeting/workshop, totaling 107 participants.

3.6.2 Among the most relevant aspects discussed during the meeting are:

➤ ***Agenda Item 1 Review of the RNAV routes Implementation Programme***

Implementation dates for the RNAV routes included in the amendment presented to ICAO Council after the AP/ATM/5 Meeting/Workshop were agreed. Likewise, Brazil presented a proposal contemplating the restructuring of the Routes Network within their airspace, other States also proposed new RNAV routes, realignment/extension of existing routes and deletion of some routes of the ANP CAR/SAM. The ICAO Secretariat is processing the information provided by the States involved in order to start the corresponding amendment process. Likewise, the United States informed that route UL 471 could already be reactivated and the segment in the Havana FIR implemented, since the special use Areas between the Miami and Havana FIRs would be NOTAM activated in order to use the referred route.

➤ ***Agenda Item 2 Action Plan for RNP Implementation in the CAR/SAM Regions***

Review of the Action Plan for RNP 10 Pre-Operational Implementation in parallel routes UL 780 and UL 302 in the Santiago de Chile-Lima segment

The CARSAMMA presented the Safety Assessment report for RNP 10 Pre-Operational Implementation in parallel routes UL 302 and UL 780 in the Santiago de Chile-Lima segment, indicating that the collision risk value found for the actual traffic in the Santiago de Chile-Lima segment of the referred routes is 7.3350×10^{-10} , lower than TLS of 5×10^{-9} established for the CAR/SAM regions. This collision risk has been estimated for traffic growth rates of 2,4% and 6% for the period from 2002 to 2012. The report is already published in the CARSAMMA and the ICAO SAM Office Web sites. Likewise, IATA presented a cost/benefit analysis, indicating an estimated saving of US\$900,000 per year. Considering the favourable results of both reports, Chile and Peru agreed to continue with the implementation, foreseen for 22 January 2004.

Review of the CAR/SAM RNP Application Strategy

The rapporteur of the RNAV/RNP Task Force (RNAV/RNP/TF) proposed the updating of the ATM Evolution Tables of the CAR/SAM Air Navigation Plan (ANP), Vol. II – FASID, regarding RNP application. Taking into account that such proposal requires further analysis, it was agreed that it be reviewed by the RNAV/RNP/TF and the ICAO NACC and SAM Offices and the results be presented at the Third Meeting of the GREPECAS ATM/CNS Subgroup (ATM/CNS/SG/3). Likewise, it was agreed that the RNAV/RNP/TF together with specialists from Argentina, Brazil, Cuba and Uruguay, study the feasibility of RNP implementation in the Brasilia, Curitiba, Ezeiza, Montevideo and Havana FIRs; which, according to the information provided by CARSAMMA, would be the most appropriate FIRs and with a greater potential for a prompt RNP implementation, and present the results at the ATM/CNS/SG/4 Meeting.

➤ *Agenda Item 3 Review of the issues related with RVSM Implementation in the CAR/SAM Regions*

The most relevant aspects were, among others, the following:

- *ATC Simulations and RVSM Training;*
- *Operational Requirements and Costs of the Modifications in the ATC Automated Systems;*
- *ATC follow up table and General Survey on RVSM Implementation status;*
- *RVSM Concept of Operations (CONOPS) approval;*
- *Draft CAR/SAM RVSM Guidance Material;*
- *RVSM Phraseology;*
- *Communications failure procedures in RVSM operations;*
- *Lateral offset procedures;*
- *RVSM operational readiness target;*
- *RVSM transition (switch-over);*
- *RVSM approval requirements for aircraft and operators;*
- *Evaluation of the RVSM monitoring charge;*
- *Safety assessment strategy;*
- *Large height deviations.*

➤ *Agenda Item 4 Other matters*

In view of the number of activities that should be carried out during the next year in order to accomplish the Task List for RVSM Implementation in the CAR/SAM Regions, it was agreed the ICAO Secretariat takes the necessary measures to convene a special three-day meeting of the RVSM Task Force during the month of March 2004, previous to the GREPECAS ATM/CNS Subgroup Meeting.

3.6.3 The cost of this activity for RLA/98/003 project, including experts, support of the ATM project expert, administrative support, air tickets, DSA, simultaneous interpretation and miscellaneous was of **US\$ 73,800.00** approximately.

3.7 Seminar on CNS/ATM Human Resources and Training (Cartagena de Indias, Colombia, 14 – 18 July 2003) *(Activity 9 of the tentative program of activities for 2002)*

3.7.1 The Seminar on CNS/ATM Human Resources and Training was held in Cartagena de Indias, Colombia, from 14 to 18 July 2003 and its main objective was to provide information regarding the material developed for the Human Resources Planning Manual.

3.7.2 This seminar was successfully carried out, enabling the development of a Workshop in which the participants had the opportunity to practice the Worksheets designed with the purpose of helping civil aviation administrations of the CAR and SAM regions in human resources strategic planning, allowing a very important integration due to the feed-back obtained from the participants through accurate remarks, that will contribute in the improvement of the above mentioned material.

3.7.3 Likewise, through the presentations of the delegates from Argentina, Brazil, Chile, Colombia, Cuba and Peru, it was possible to know about their experiences in human resources planning.

3.7.4 Thirty seven (37) participants from 9 States attended this seminar: Argentina, Brazil, Chile, Colombia, Cuba, El Salvador, Panama, Peru, Venezuela, and one International Organization: COCESNA.

3.7.5 The cost of this activity for RLA/98/003 project, including experts, air tickets, DSA, simultaneous interpretation and miscellaneous was of US\$ **29,225.00** approximately.

3.8 Seminar on future air navigation systems automation (one week in Lima, Peru, in 2004, dates to be determined) *(Activity 8 of the tentative program for 2003)*

3.8.1 The seminar on ATM automation is foreseen with the purpose of reviewing the functionalities of the data processing systems and the applications in the ATM systems in order to initiate, in the SAM Region, the consideration of this important matter. It is evident that in the light of the results of the Eleventh Air Navigation Conference, AN-Conf/11, CNS/ATM technologies, by themselves, do not provide a solution for the implementation of the regional/global ATM system. The design of such system should be based on clear operational requirements and operational safety criteria, as well as a cost/efficient implementation giving due consideration to the human resources required and the users expectations. It is expected that this seminar could present a clear overview to the States regarding this aspects, considering all navigation services comprised in the implementation of the ATM system and be, at the same time, the starting point to prepare material that may allow to continue with the development of regional plans on this matter supporting the work of the GREPECAS ATM/CNS Subgroup.

3.8.2 This seminar has been postponed to be carried out during 2004.

3.9 Seminar/Workshop on the detrmination of WGS-84 vertical data (Rio de Janeiro, Brazil, 1 - 5 December 2003) *(Activity 9 of the tentative program for 2003)*

3.9.1 During the week from 1 to 5 December 2003 and as programmed, the WGS-84 Seminar/Workshop for the CAR and SAM Regions will take place; it is foreseen that with the development of this activity the need of the States regarding the implementation requirements for the vertical elements of WGS-84 system will be attended. Among the most relevant aspects to be considered during the this seminar are the following:

- Establishment of the basic concepts on ellipsoid models (local and WGS-84), and the geoid (MSL and gravimetric) and their close inter-relation;
- MSL concepts, orthometric heights, WGS-84 ellipsoid heights and on the WGS-84 geoid undulation;
- Considerations to be taken into account when executing the post-process calculations to determine the data on WGS-84 geoid undulations;
- Applications of appropriate electronic tools in the process and post-process phases for the determination of the data of orthometric heights and WGS-84 ellipsoid heights and of the WGS-84 geoid undulation data; and
- Methods to ensure the quality of the WGS-84 geoid undulation data published.

3.10 The meeting took note that the tentative programme of activities approved by the fifth coordination meeting has been successfully implemented in 94% at a total cost of **USD 261,400.00** approximately, without taking into account the activities to be executed until 31 December 2003, including the WGS-84 Seminar from 1 to 5 December 2003.

3.10.1 The meeting took note that for the activities that have already been implemented during 2003 (excluding the WGS-84 Seminar) the Fifth Meeting of the Coordination Committee had calculated an estimated budget of **USD 293,600.00**.

3.11 **Annual Project Report**

3.11.1 Subsequently, the annual report of the project was presented to the meeting, which consists in an evaluation of the project during the year and that should be completed by the project members and by the addressees, the project administration, the States and UNDP and has the following objectives:

- a) Provide a written appraisal and a valuation of the project progresses towards the achievement of the results foreseen;
- b) Present the opinions of the directly involved on the matters that affect the execution of the project and their proposals to solve this matters;
- c) To be used as an input for any project evaluation;
- d) To be used as a source of contributions for the preparation of the annual report.

3.11.2 **Contents and Structure**

3.11.2.1 The structure of this report consists of three parts. In the first part, a numerical evaluation of the relevance and development of the project, as well as a general evaluation of the project is required.

3.11.2.2 In the second part, a written valuation of the project is required, specially of the main successes, the initial evidences of success, issues and problems, recommendations and lessons learned.

3.11.2.3 The third part consists of a summarized table composed of two sections: in one, information on resources and expenditures is provided and in the other one, the advance towards the achievement of the expected results is highlighted.

3.11.2.4 In the first part a numerical evaluation of the indicated aspects is required. **Appendix B** of this part of the report presents a draft of the RLA/98/003 project annual report.

3.11.2.5 After analyzing the contents of the report and highlighting the importance of making a more detailed analysis, the meeting requested ICAO to distribute the annual report to all the member States of the project for its review and completion of the corresponding sections until the end of February 2004 and to submit such information to the ICAO SAM Office for its consolidation.

Appendix A

International Civil Aviation Organization

Report of the Visits

1. Mission programme

1.1 The mission programme consisted in visiting six States (Bolivia, Colombia, Quito, Panama, Honduras-COCESNA and Venezuela) to present:

- status report on the activities of the project;
- detailed presentations on ATM improvements activities;
- institutional considerations and implementation options; and
- what is to be done next.

2. Status Report

2.2 Considering the duration of the presentations, both the status report and what next were combined into one presentation and emphasized the importance of the 11th Air Navigation Conference and its impact on future orientation of the systems. Among the items covered in more details in the status report presentations are:

- Project organization and evolution;
- Results achieved and expected throughout the phases of the project;
- 11th Air Navigation Conference;
- CNS systems proliferation and performance;
- CNS/ATM PET;
- CNS/ATM automation; and
- What is expected for the subsequent phases of the project.

3. ATM improvements

3.1 With regard to ATM, a detailed presentations of the activities related the implementation of ATM improvements, as identified by the project, was made emphasizing RNAV, RNP and providing information on the steps taken towards the introduction of RVSM. Among the items covered were:

- Planning process;
- Make up of the traffic flows in the CAR/SAM regions;
- RNAV, RNP and RVSM as a means of improving efficiencies and airspace capacity;
- Benefits;

4. Institutional arrangements in the provision of facilities and services

4.1 Considering the capabilities and cost of the new technologies, significant financial and operational benefits can be achieved through the sharing of resources. Furthermore, acknowledging the reluctance of States to modify their mode of operations, emphasis was made on articles of the Chicago Convention concerning the rights and obligation of States with regard to the provision of facilities and services. To this effect, the presentation covered the following topics.

- Articles of the Convention;
- ICAO Policy and guidelines;
- Description of institutional options;
- Applicability of institutional arrangements in the provision of facilities and services in the CAR/SAM regions;
- Preliminary evaluation of the relative merits of different institutional arrangements.

4.2 The presentations generated much interest and resulted in very involved discussions, question and comments from the participants and these are summarized in the report under “General Comments” with regard to topics and “Specific Comments as applicable to specific states. As a last item of the report, recommendations are made with regard to the needs and conduct of the project as well as observations that could assist in facilitating ICAO/State relations.

5. General Comments

5.1 Project documentation

5.1.1 During that presentation, the meeting was presented with a history of the evolution and activities of the project. When making specific references to routes and statistics for example, the meeting asked where they could get additional information. The meeting was informed that the information relating to the first three phases of the project had been documented in Volume 1. and that Volume 2 was soon to also be published. In all the States visited no one knew of or have seen Volume 1. To this effect, a recommendation has been formulated in the Recommendation section.

5.2 CNS

5.2.1 GNSS

5.2.1.1 GNSS is still very much a concern with regard to dependency, liability and availability. Furthermore, the non-satisfactory performance observed and the need to retain conventional backup has greatly affected the viability of the service. The meeting was informed that this topic was to be covered in great details at the forthcoming 11th Air Navigation Conference and should provide that we can expect a more precise vision as to its future applicability. The meeting was informed that GNSS was likely to be retained as one additional sensor in the provision of navigation solutions. From a legal and institutional standpoint the dependency issues and its affect on sovereignty are still vivid and there is hope that Galileo will somewhat alleviate that concern. Additionally, there were still questions about cost and availability of reliable and precise augmentation systems.

5.2.2 Communication and surveillance

5.2.2.1 The concern with the proliferation of communications, navigation and surveillance solutions was also expressed and the fact that in many cases, North America and Europe were going in different directions complicating the decision process of CAR/SAM States who have to provide service to aircraft flying to both Europe and North America. There again, the meeting was informed that while Annex 10 already includes many possible data links, many are still at the prototype level or used for specific applications only. It was noted that the ICAO Air Navigation Commission had requested the ACP Panel to further investigate the capability of VDL 4 as a generic data link and also to investigate the possibility of developing a data link that would meet all requirements. Concerning the present uncertainties with regard to performance, availability and cost, it was suggested that emphasis be put on the development and implementation of automation, which will be the main users of communications facilities. The same concerns of proliferation, performance, availability and price are also applicable to navigation and surveillance. Therefore the need to be prudent in making substantial investments in technologies that are not yet mature. Considering the high level of activities by ISI through TDA, which are looking at only the present national situation without due consideration to adjacent States position and future systems requirements, are proposing costly systems upgrades or replacement that might not be in line with the regional plan and the future transition to CNS/ATM.

5.2.3 CNS/ATM Planning and Evaluation Tools (CNS/ATM PET)

5.2.3.1 The brief overview of CNS/ATM Planning and Evaluation Tools was very well accepted and a CD containing the financial model and documentation in both Spanish and English was provided to the States visited. In presenting the model, it was noted that as the planning process evolved there would likely be some updates required. In the discussions, some propositions were made such as. PET was developed to evaluate the incremental cost of scenarios and the resulting financial aspect (business case). It was suggested that PET might be upgraded to also consider complete cost. Additionally, at present, a life cycle applicable to all nav aids is used to determine replacement or removal of stations. It was observed that it might be useful to be able to have the capability of using fixed date instead of life cycle periods.

5.2.4 Automation

5.2.4.1 In line with the proposed global operational concept where systems interconnectivity is a must, it was emphasized that not only a minimum of automation would be required everywhere but also that those systems would need to be harmonized both at the functional and data base level. In this respect, a complete audit of all systems in the CAR/SAM regions will need to be made to determine what exist, what will be required and the type of implementations or upgrades that will be necessary. This is a critical and complex task that must be initiated immediately since it will significantly influence the type of support services needed.

5.3 ATM

5.3.1 RNAV, RNP and RVSM

5.3.1.1 The meeting accepted that the operational and financial benefits that can be derived from the implementation of RNAV, RNP and RVSM are very substantial but it also commented that this would all accrue to the airlines and as such affects the motivation in implementing those improvements. It was

noted that even though these improvements are mostly beneficial to airlines, the States need to perform those ameliorations if they are to cope with the increase in traffic in a cost-efficient manner and the survival of airlines is also their survival. In any case, ICAO provisions ensure that all costs incurred by a State for the implementation of facilities and services are recoverable and possibly include an acceptable rate of return on investments.

5.3.1.2 As an additional consideration, it was noted that, although States are actively participating in RVSM seminars/workshops and AP/ATM meetings, in many cases, aircraft certification is still very vague and must be urgently addressed if RVSM is to progress on schedule.

5.3.2 SIDs and STARs

5.3.2.1 With regard to RNAV implementation, it was observed that while the routes are being very well defined, many States have not yet developed the related SIDs and STARs, therefore affecting overall efficiencies. Furthermore, in many States, not only do they use TERPs instead of PAN OPS but also mix the TERPs and PAN OPS procedures within a same area. To this effect, ICAO should take the necessary measures to ensure that States take appropriate action to eliminate these inconsistencies and use the ICAO PAN OPS in the design of procedures.

5.3.3 AP/ATM

5.3.3.1 It was generally agreed that AP/ATM was an important tool in the implementation of the CARSAM Air Navigation Plan and their increased participation should be encouraged.

5.4 INSTITUTIONAL ARRANGEMENTS

5.4.1 Working arrangements

5.4.1.1 States demonstrated a general acceptance and interest concerning institutional arrangements but still expressed the same concerns concerning national sovereignty and liability issues. To have a better appreciation of the applicability of the different institutional arrangements available, a matrix of arrangements and application was presented showing their relative merits in meeting the critical criteria. Recognizing the operational and financial advantages that can be derived from such arrangements, they requested that this matter be urgently addressed considering that already some regional systems or functions are being implemented and that the associated arrangements for those systems should all fit within a regional framework. There was some confusion as to the role of the Institutional Task Force, the project and the work being carried out on the specific items such as REDDIG and CARSAMMA.

5.4.2 Blueprint of arrangement

5.4.2.1 It was recognized that active State participation will be required before a blueprint of an institutionally, operationally and viable regional agreement that satisfies all the critical criteria (sovereignty, safety, etc.) and ensures cost recovery can be developed (high administration level) and finally a consensus reached (ministers level) noting that even though the final institutional approach selected shall meet all the technical, operational and financial objectives, the final decision will still be political.

5.4.3 State specific comments

5.4.3.1 Bolivia

5.4.3.1.1 Bolivia has shown a genuine interest in CNS/ATM and has already initiated the development of a national plan taking advantage of an offer by The USA Trade Development Agency (TDA) to assist in such a development. The present requirements are quite modest considering the traffic in their airspace but, nevertheless, they expressed concerns with regard to the provision of en-route radars or ADS.

5.4.3.1.2 The other item of concern relates to human resources requirements and training for the implementation, transition and subsequent operation of CNS/ATM. ICAO should undertake to provide assistance in the definition of the tasks to be carried out as well as assist in the determination of the number and type of people and training required for the transition CNS/ATM.

5.4.3.1.3 The working relation between Director General Aviation Civil (DGAC) and ASAANA is presently excellent which should greatly facilitate the planning, transition and operation of the new CNS/ATM systems. It should be noted that Bolivia has also accepted an unconditional offer by TDA to assist in the planning. The main concern for the present relates to the provision of surveillance on the Santiago-Sao Paulo and Rio de Janeiro route and, whether sharing radar signal with Brazil, or installing SSR or ADS should do it.

5.4.3.2 Colombia

5.4.3.2.1 Colombia's approach in planning for the future is very well organized. They already completed an exhaustive review of their cost accounting systems and are looking forward to do financial planning. Through TDA, ISI, a private US company, has also made a national plan covering the period of 2003-2013 for Colombia. The plan defines the present and future operational requirements and also includes a cost benefit analysis. Again this plan does not take into consideration adjacent States and is mostly systems upgrade oriented. Colombia has just commissioned a new ACC and is ready to implement new functions.

5.4.3.2.2 The strategic plan highlighting all the technical and operations options along with the results of the CBA and Business Case are expected in ten months. The CNS/ATM planning committee is well organized and has already achieved significant progress.

5.4.3.2.3 Colombia is very interested in institutional issues but still suspicious of the end results.

5.4.3.3 Ecuador

5.4.3.3.1 Ecuador is in the process of completely restructuring DGCA and as such, did not give sufficient consideration to CNS/ATM transition planning. Matter of fact, the whole planning is kind of neglected even though they have a planning committee and many areas of their summary plan lack definitions. Much work is required and probably external assistance.

5.4.3.4 Panama

5.4.3.4.1 Panama has a well-organized planning committee and has presented a copy of their draft plan. All indications are that the emphasis is on replacing and upgrading their conventional systems

without too much attention to the future transition to CNS/ATM global system. Considering the high degree of involvement of ICAO Technical Cooperation and the high level of investment, conflict of interest could develop where one side of ICAO in line with the ANP considers the long term and TCB short-term objectives. There is already a proliferation of communications systems (MEVA II, Reddig, VSAT). for example Panama.

5.4.3.4.2 Panama considers that it has a strategic location and that it does not need to get into a multinational arrangement for the provision of future air navigation services thinking that it would only force them to share the strategic advantages they presently enjoy even though views have been exchange on sharing for example radar signals with CENAMER to cover the northern portion of their FIR, studying the possibility of upgrading their AIS database and developing GNSS-based NPA.

5.4.3.5 COCESNA

5.4.3.5.1 COCESNA is in the process of commissioning their new ACC and are upgrading their conventional radar and communication. (MEVA II). The attention seems to be more focused on immediate improvements rather than long term planning and transition to the global ATM concept. Even though COSESNA has been a multinational organization for almost 50 years, their arrangement is one where each participating States is autonomous in many areas of the operation and cooperate on matters of regional importance. They did not seem interested in discussing too much their specific arrangement. When questioned, they were polite but reserved. Considering that the project would benefit from their experience, a formal request might be desirable.

5.4.3.6 Venezuela

5.4.3.6.1 Venezuela is also very involved with TDA and ISI in the development of their national CNS/ATM Transition Plan. A complete survey of all their facilities has been completed and the shortcomings and expectations well documented. Again the plan seems to concentrate on immediate local improvements with little consideration to future planning and the ICAO ANP. ISI is expected to deliver their final recommendations and timelines for their execution before the end of the year. The fact-finding and analysis seems very complete and should facilitate the planning and transition process but this should be done within the ICAO context of the Regional Plan and the Global ATM Operational Concept.

5.4.3.6.2 In Venezuela, just like in Panama, TCB and also very involved into the replacement or upgrade of conventional facilities. Considering that the States will want to recover their investment, this will surely have an effect on the timing of the transition. These changes should be coordinated and made taken into consideration the CAR/SAM Air Navigation Plan.

5.4.3.6.3 It should be noted that although the objective of the mission was not to detect shortcomings, when visiting the Maiquetia ACC it was once again observed that this facility requires urgent enhancements to provide safe and efficient ATC services. Therefore it is highly recommended that the Venezuelan Authority take appropriate actions to improve the facilities in order to avoid negative impact in the RVSM, RNAV and RNP implementation process.

5.5 Conclusions and recommendations

5.5.1 As a result of the general comments expressed above and other issues raised during the meetings, the following recommendations have been formulated.

5.5.2 CNS/ATM national planning committee

5.5.2.1 It has been observed during discussions with national planning committee that many important sectors were not adequately represented in the committee such as financial, legal, airlines, etc. While the present arrangement might be more direct and explicit it will, nevertheless raise issues later on. Failing to do so, the plan will not adequately address concerns, secure necessary consensus, which could result in difficulties in reconciling the needs and objectives of the different stakeholders and might, at a later stage, require re-planning. As such, GREPECAS should encourage State to include in their planning process, all parties that will be directly and indirectly affected by the transition to the new CNS/ATM systems.

5.5.3 Special attention of the CAA as an active participant in the workshop

5.5.3.1 Considering that the implementation of CNS/ATM will impact all levels of State Administrations, it is important that CAA administrators and policy makers be closely associated with the national and regional planning process to ensure that adequate policy are developed and that the institutional issues including financing are timely addressed and resolved in phased with the project schedule.

5.5.4 CNS/ATM Automation

5.5.4.1 Considering that the global ATM system will require a minimum of automation by all the contributors to the global ATM system and that many of the existing system while performing adequately in a autonomous environment will not be gracefully interconnected to others, immediate attention should be given to the conduct of an audit of all systems in the region to establish the present levels of functional capabilities, identify issues of interconnectivities and determinate future requirements in order to establish a coherent plan for the interconnection of automated systems including related databases.

5.5.5 Regional approach concerning the design procedures

5.5.5.1 As part of the transition to the new CNS/ATM systems, many new procedures will need to be designed or redesigned. At the moment there are inconsistencies in the standards used (ICAO PANS/OPS vs. FAA TERPS). Considering that some States, because of the assistance received are implementing TERPs based procedures mixed with PANS/OPS procedures produces great inconsistencies. This situation, in addition to creating confusion also has safety implications and eventually complicate the harmonization of the systems.

5.5.5.2 To this effect, GREPECAS should urgently remind States on the need to implement ICAO standard (PANS/OPS) procedures. This could result on the need for ICAO to conduct additional training and workshops.

5.5.6 National planning within the context of the ICAO Regional Air Navigation Plan

5.5.6.1 During discussions with the national CNS/ATM Planning Committee, it was realized that the national planning process did not always closely refer to the ICAO Regional Air Navigation Plan. This was, partly, due to the need to resolve present shortcomings and also the fact that many of the National Plans are being developed by independent organizations, which only consider national needs and fail to consider adjacent requirements. Furthermore, the national plans developed by those independent

organizations do not at all address institutional issues and multinational implementation options. To this effect, GREPECAS should, to the extent possible, be able to review and comment on those proposed plans to ensure that all issues are adequately addressed and fit within the regional plan as well as ensure that adequate coordination with adjacent States has been conducted to ensure continuity, and make possible multinational arrangements.

5.5.7 AP/ATM institutionalized as an implementation tool of ATM sub group

5.5.7.1 Considering the high level of commonality of tasks carried out by the AP/ATM and the ATM planning group of GREPECAS, it is recommended that the two bodies concerned with ATM planning and implementation respectively, be formally link to ensure that right from the beginning common objectives as well as subsequent actions required for the efficient implementation of CAR/SAM ANP are agreed to. Furthermore, considering the finite life of the project, the relationship of AP/ATM and GREPECAS should be formalized to ensure continued support in the ATM implementation process.

5.5.8 Growing interest of States in the establishment of multinational arrangements

5.5.8.1 There was a general acceptance on the value of establishing institutional arrangements for the provision of facilities and services. Nevertheless, while the principle was accepted, the level of uncertainties and the lack of concrete actions delays the decision process for the establishment of an urgently required framework that will encompass all regional facilities and services and be capable of future expansion. To this effect, additional seminars and workshop are necessary to I increase the level of understanding and enable State to reach a consensus on an approach.

5.5.8.2 To this effect, the Project in conjunction with the Task Force on institutional issues should organize additional seminars and workshops.

5.5.9 States to include in their transition plans institutional aspects, which could have impact on the transition process

5.5.9.1 Many States are already deeply involved in CNS/ATM transition planning but unfortunately it was also realized that very few included as part of their national planning institutional issues preventing the considerations of institutional arrangements for the provision of facilities and services. The lack of considerations not only has impact at the national level but also at the regional level since it would reduce if not eliminate the financial and operational benefits that could be derived from such arrangements and further complicate the rationalization and harmonization of the systems including the coordination.

5.5.9.2 To this effect, GREPECAS should remind States to include in their planning process, officers responsible for administrative and policy matters concerning facilities and services.

5.5.10 Institutional considerations concerning established services

5.5.10.1 Considering that many CNS/ATM contributing facilities and services are already being implemented and treated as separate entities both from an operation and administration standpoint, concerns were expressed as to how these could eventually be integrated into a regional framework without great difficulties. To this effect, GREPECAS should request the Task Force on Institutional matters to urgently consider the establishment of a framework that will eventually facilitate the

integration and rationalization of the infrastructure necessary to operate and administer cost efficiently the regional systems.

5.5.11 Human resources and training requirements

5.5.11.1 States expressed concerns with regard to human resources requirements and training associated with the implementation and transition to the CNS/ATM. The lack of definition of the new environment and related tasks prevents States from making an adequate assessment of the needs. To this effect, chapter 6 of the project documentation should be distributed to States as a first step (included in Volume 1). Secondly, this chapter should be augmented to provide more information on CNS/ATM and automated systems environment including operation, database creation, maintenance and then through appropriate seminars and workshops, assist States in the determination of appropriate strategies to establish staffing and training requirements including the development of the necessary schedule to ensure the timely availability of staff for the transition and operation of the new CNS/ATM systems in the regions in line with the CAR/SAM Air Navigation Plan.

5.5.12 Project Documentation and distribution

5.5.12.1 In presenting the results so far achieved by the Project it was noted that the documentation had not been received or at least was not received by those concerned in the planning of CNS/ATM. To this effect, it is recommended that appropriate actions be taken to ensure proper distributions. The matter should also be reviewed at the next project coordination meeting.

APPENDIX B**ANUAL REPORT
UNDP/ICAO PROJECT RLA/98/003
Transition to CNS/ATM Systems in the CAR and SAM Regions****Project's Basic Information**

Number and title of the project:	RLA/98/003 Transition to CNS/ATM Systems in the CAR and SAM Regions
Designated institution:	ICAO
Project's starting date:	
Originally foreseen	16 July 1998
Effective	19 December 1998
Project's termination date:	
Originally foreseen:	15 June 2001
Effective:	15 June 2006
Total budget (dollars):	
Initial amount:	2,005,100
Last approved revision	2,420,240
Period of the report:	March 2003 to November 2003

In relation to the last year of the project, explain the fundamentals of your evaluation, which do not have to limit exclusively to the relevance and performance criteria previously evaluated and may not concur with the previous evaluation.

In the global evaluation, an estimation of the possible success of the project should be included, as well as of its relevance or achievement.

The project has become an important implementation instrument for the re-structuring of the ATS Routes Network of the CAR/SAM Regions, achieving the implementation of 11 RNAV Routes and with 14 RNAV Routes in the implementation process, foreseen to be executed during 2004. Likewise, it has assisted in the realignment/extension of 9 ATS routes and the deletion of 7 ATS routes.

Besides, the project has supported the RNP 10 Pre-Operational Implementation process in the Santiago de Chile-Lima segment of the RNAV parallel routes UL 302 AND UL 780, foreseen for 22 January 2004.

It is also supporting the RVSN Implementation process in the CAR/SAM Regions, foreseen for 20 January 2005.

Through the Meetings/Workshops of Air Traffic Management Authorities and Planners of the CAR/SAM Regions, the Administrations have obtained experience in the planning and implementation process of RNAV, RNP and RVSM routes.

Such experience is being applied in their particular national planning and implementation processes.

Furthermore, thanks to the support of the project the regional coordination process has been improved. In general, a degree of awareness and maturity has been evidenced in the Region, which is reflected in the level of the proposals, interventions and discussions in the different regional meetings.

Additionally, the “*Guidance Material towards an ICAO Global ATM Evolution in the CAR/SAM Regions*” has been completed, but as a result of the Eleventh Air Navigation Conference an updating may be required in order to accurately reflect the new orientation. The modified version is planned to be distributed at the beginning of 2004.

The project also developed a methodology for the analysis of institutional arrangements options, which will be submitted to the consideration of the GREPECAS Institutional Aspects Task Force.

Under Immediate Objective No. 3, related to the Implementation of the 1984 World Geodetics System (WGS-84); a series of specific actions have been carried out in order to directly support the States in the effective implementation of this technical requirement. In this sense, technical missions were carried out to 11 CAR/SAM States by an international consultant, who not only provided assistance, but also developed field geodetics works in the main international airports of the States visited. As part of the activities carried out, two WGS-84 seminars/workshops were carried out in Santa Fe de Bogota, Colombia, with the participation of six and eight CAR/SAM States, respectively, and where a total of 44 specialists of the participant States were trained. As part of the activities being executed by the project, under Immediate Objective No. 3, works are being carried out in every task directly related with the holding of a WGS-84 seminar/workshop, mainly devoted to the implementation of the vertical elements of this geodetics reference system for international civil aviation.

PART II: DESCRIPTIVE EVALUATION

1. *Which are the main achievements of the project in relation to the expected results, during the year included in the examination? When possible, include an evaluation of the possible effects, of the support and of the contribution to the development of the capacity.*

Regarding ATM, the project has been an instrument in the development of a restructuring programme of the ATS Routes Network of the Air Navigation Plan (ANP) of the CAR/SAM Regions that includes:

- 11 RNAV routes implemented;
- In coordination with the ATM Officers and the States involved, study and preparation of the ANP CAR/SAM Proposal for Amendment of:
 - Implementation of 14 RNAV routes;
 - Realignment/extension of 13 ATS routes;
 - Deletion of 7 ATS routes;
 - Deletion of 12 ATS routes segments.
- Continuation of the RNP 10 Pre-Operational Implementation Programme in the Santiago de Chile-Lima segment of parallel routes UL 302 and UL 780, foreseen for 22 January 2004.
- Continuation of the Implementation Programme of the Reduced Vertical Separation Minimum (RVSM) in the CAR/SAM Regions, foreseen for 20 January 2005.

Besides, through the seminars and missions to provide assistance to States, training has been granted to more than 950 specialists of the different Administrations responsible of the transition to CNS/ATM systems.

2. *Which are the main issues and problems that affect the achievement of the project's results?*

The project is having an active leadership in the Coordination, Planning and Implementation process of the CNS/ATM elements; which is allowing an active and timely participation of ATM, CNS, Operations and Airworthiness Specialists of the States/International Organizations of the CAR/SAM Regions, even of those which are not contributing to the Project.

Even though it is not yet a problem, not all the States of both regions are contributing to the Project. In order to continue with other CNS/ATM elements Implementation that will be necessary, as RNP, or ATM Automation, it will be necessary the participation of more States.

How could these issues or problems be solved? Please explain in detail the recommended action or actions. Specify who should be in charge of these actions. Indicate, also, a provisional calendar and the necessary resources.

The project has established a flexible policy in respect of the contributions for the rest of the years of the project, additionally ICAO promotes the activities of the project with other States. At the same time, GREPECAS recommends the States to adhere to the project.

3. *What new events could probably affect the achievement of the project's results? What do you recommend to resolve these events?*

Some States have not deposited their cost sharing contributions, which could seriously affect the duration of the project and the activities to be developed.

4. *What are the opinions of the States concerning the project?*

According to the opinions gathered from the Civil Aviation Authorities during the Missions to the States carried out by the Project's Experts, the project is an excellent tool that is enabling to speed up the Planning and Implementation process in the CAR/SAM Regions, through the Meetings/Workshops and Seminars, in which specialists from most of the States/International Organizations from both Regions have participated.

5. *So far, what knowledge (positive and negative) could be obtained from the experience of the project?*

Concerning ATM, the Project has become, through the AP/ATM Meetings, a discussion forum for the decision making in the Implementation Planning process; allowing an active participation of most of the States/International Organizations involved in the CNS/ATM elements Implementation process, even of those which are not members contributing to the Project. Likewise, it is enabling the ATM Authorities and Specialists of the CAR/SAM Regions to obtain greater experience in the implementation process. The Regional coordination process has also been improved and it is contributing to eliminate some ATM and CNS deficiencies such as the Implementation of the Area Control Centre (ACC) of Georgetown in Guyana, having achieved that all the Upper Airspace of the CAR/SAM Regions be controlled airspace, where the Air Traffic Control Service is provided. The increase in the communications coverage in some FIRs. Likewise, the Civil/Military Coordination has been improved, having accomplished the deletion or modification of Prohibited and Restricted Areas in some States of the CAR/SAM Regions, allowing RNAV routes to over-fly such areas and, therefore, a greater airspace flexibility.

6. *Do you propose any substantial revision in the project document? If affirmative, which are those revisions? Indicate the justification.*

So far, it is not necessary to make any substantial revision to the project document.

7. *Provide any other information that could better support or clarify your project evaluation. You may include the necessary annexes.*

PART III: Diagram of the project

Title and number of the programme or project:	RLA/98/003 – Transition to CNS/ATM systems in the CAR/SAM Regions	Management arrangements:	
Designated Institution:	ICAO	Period involved:	December 1998 to November 2003
GLOBAL EVALUATION			

FINANCIAL SUMMARY			
Source of funds	Budget (US dollars 000's)	Expenditures (US dollars 000's)	Execution rate (%)
Participation in the expenditures financing: Governments:	--N/A--	1,2 (1998)	N/A
Argentina	200,500.00		
Bolivia	200,500.00	--N/A--	299,7 (1999)
Brazil	200,500.00		
Chile	200,500.00		
Colombia	200,500.00	--N/A--	295,8 (2000)
COCESNA	200,500.00		
Ecuador	200,500.00		
Panama	200,500.00		
Paraguay	200,500.00	--N/A---	308,3 (2001)
Peru	200,500.00		
United States	200,500.00		
Venezuela	200,500.00	--N/A--	216,7 (2002)
Interests	14,120		
TOTAL	2,420,240.00		
	569,4 (2003)	334,8 (2003)	59 %

SUMMARY OF THE RESULTS		
Immediate Objectives	Indicators	Goals
<p>Immediate Objective N° 1</p> <p>Advise States in the planning and implementation of the transition to the CNS/ATM systems and in the definition of the most convenient options, according to the implementation schedule agreed for the CAR and SAM regions, including the specifications of the required systems and the analysis of the cost-benefit relationship of each option.</p>	<p>Indicator # 1.1</p> <p>Development of at least 11 CNS/ATM national/regional implementation plans</p>	<p>Most of the States/International Organizations have developed their respective CNS/ATM National Plan, some are in the revision process and other in the approval process by their corresponding national authorities.</p> <p>Specifically, the RNAV Routes Implementation Plan, as well as the RVSM Implementation Plan are Regional Plans that involve every State/International Organization of the CAR/SAM Regions, and the RNP 10 Implementation Plan in the Santiago de Chile-Lima Segment of parallel routes UL 302 and UL 780, involves, for now, Peru and Chile.</p>
	<p>Indicator # 1.2</p> <p>At least (3) three CNS/ATM systems components implemented</p>	<p>RNAV Routes in the CAR/SAM Regions</p> <ul style="list-style-type: none"> ▪ 11 routes implemented; ▪ In implementation process, foreseen for the first semester of 2004: <ul style="list-style-type: none"> ○ 14 RNAV routes; ○ Realignment/extension of 13 ATS routes; ○ Deletion of 7 ATS routes; ○ Deletion of 12 segments of ATS routes. <p>RNP (Required Navigation Performance)</p> <p>In RNP 10 Pre-Operational Implementation process in the Santiago de Chile-Lima segment of parallel routes UL 302 and UL 780, foreseen for 22 January 2004.</p> <p>RVSM (Reduces Vertical Separation Minimum)</p> <p>In RVSM Implementation process in the CAR/SAM Regions, foreseen for 20 January 2005.</p>

SUMMARY OF THE RESULTS		
Immediate Objectives	Indicators	Goals
	Indicator # 1.3 At least 1500 persons would have received training on matters related to CNS/ATM transition.	Training has been granted to 959 persons in the different seminars/workshops organized by the project, corresponding to 220 man/months of training.

SUMMARY OF THE RESULTS		
Immediate Objectives	Indicators	Goals
<p>Immediate Objective N° 2</p> <p>Advise States in the institutional schemes for the implementation of CNS/ATM national/regional plans and their application.</p>	<p>Indicator # 2.1</p> <p>Availability of guidance material for the identification and validation and implementation of institutional arrangements for CNS/ATM systems.</p>	<p>The “<i>Guidance Material towards an ICAO Global ATM Evolution in the CAR/SAM Regions</i>” has been completed, but as a result of the Eleventh Air Navigation Conference it may need to be updated in order to accurately reflect the new orientation. Its distribution is planned for the beginning of 2004.</p>
	<p>Indicator # 2.2</p> <p>At least (2) regional agreements celebrated for the management of CNS/ATM systems.</p>	<p>The CAR/SAM Regional Monitoring Agency (CARSAMMA) has been established. It is developing the evaluation and monitoring of airspace safety for RVSM Implementation in both regions, RNP 10 Pre-Operational Implementation in the Santiago de Chile-Lima segment of parallel routes UL 302 and UL 780, and for the future RNP implementation in the CAR/SAM regions.</p>
<p>Objetivo Inmediato N° 3</p> <p>Assist States in the implementation of the world geodetic system 1984 (WGS-84) and in improving their aeronautical information services.</p>	<p>Indicator # 3.1</p> <p>At least 10 States will have WGS-84 implemented.</p>	<p>Argentina, Brazil, Chile, Colombia, Ecuador and Peru have satisfactorily implemented WGS-84.</p>
	<p>Indicator # 3.2</p> <p>At least 150 AIS specialists would have received training on WGS-84.</p>	<p>117 AIS specialists have received training on WGS-84, additionally assistance visits have been carried out by a geodetics expert to the States participating in the project.</p>

Annual goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°1 Advise States in the planning and implementation of the transition to the CNS/ATM systems and in the definition of the most convenient options, according to the implementation schedule agreed for the CAR and SAM regions, including the specifications of the required systems and the analysis of the cost-benefit relationship of each option.		
1.1 Survey on the present status of the ATS/COM facilities and services available at each State, status of aircraft fleets operating in those States and definition of their international and domestic requirements.	Practically every State of the CAR and SAM regions provided the information required concerning the actual infrastructure of their area control centres, as well as the statistical air traffic data in the main ATS routes analyzed by the project, corresponding to the main 18 air traffic flows of the region previously identified in the CAR/SAM Regional Plan for the implementation of the CNS/ATM systems approved by the Air Navigation CAR/SAM Regional Planning and Implementation Group (GREPECAS).	
1.2 Officers responsible for the transition trained in the strategy of planning the change to the new systems..	Information and guidance have been provided to 959 specialists from 27 States, 4 international organizations and 6 airlines in the planning and implementation methodology of the new communications, navigation and surveillance systems and air traffic management (CNS/ATM) and in the airspace planning.	The holding of the following Seminars is planned:: Three (3) Meetings/workshops of ATM Authorities and Planners for RVSM, RNAV and RNP implementation. Air navigation systems automation seminar. Seminar on CNS/ATM institutional and economic aspects.

Annual goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°1 Advise States in the planning and implementation of the transition to the CNS/ATM systems and in the definition of the most convenient options, according to the implementation schedule agreed for the CAR and SAM regions, including the specifications of the required systems and the analysis of the cost-benefit relationship of each option.		
1.3 Updated regional action plan for the implementation of the CSN/ATM systems.	<p>The project established a four-phases action plan for the analysis of the 18 main air traffic flows identified in the CAR/SAM Air Navigation Plan, in order to determine future requirements of CNS systems according to the traffic demand and propose immediate technical and operational improvements and scenarios for the transition development, including the cost/benefit study of the different implementation possibilities, the analysis of the human resources and training requirements, the consideration of the institutional aspects involved and the establishment of planning and evaluation tools.</p> <p>The evaluation of the 18 flows has been completed determining that the introduction of air navigation routes (RNAV) and the required navigation performance (RNP) values would provide immediate advantages through the reduction of flight time and the capacity of flying at the preferred flight levels. The necessary information to develop traffic flow profiles has also been developed, to be used in the development of the State scenarios and profiles for the planning and negotiation of the transition stages with the services providers and the users, including the selection of technical and operational solutions.</p>	

Annual goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°1 Advise States in the planning and implementation of the transition to the CNS/ATM systems and in the definition of the most convenient options, according to the implementation schedule agreed for the CAR and SAM regions, including the specifications of the required systems and the analysis of the cost-benefit relationship of each option.		
1.4 National air navigation plans updated including the transition to the CNS/ATM systems..	The States of the CAR and SAM regions have initiated the updating process of their respective air navigation national plans, including the transition to the CNS/ATM systems and its harmonization with the regional plan, following the guidelines established in this regard in the corresponding ICAO documents.	

Annual goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°1 Advise States in the planning and implementation of the transition to the CNS/ATM systems and in the definition of the most convenient options, according to the implementation schedule agreed for the CAR and SAM regions, including the specifications of the required systems and the analysis of the cost-benefit relationship of each option.		
1.5 Assistance in the preparation and execution of CNS/ATM elements/systems implementation plans provided	<p>The “<i>Guidance Material towards an ICAO Global ATM Evolution in the CAR/SAM Regions</i>” CAR/SAM” has been completed.</p> <p>Visits of assistance to participant States have been carried out in order to inform on the project’s results and the status of project activities; likewise detailed presentations were carried out about the activities to improve the ATM; institutional considerations and implementation options; and on the use of PET software (Planning and Evaluation Tools)</p> <p>A CD containing PET tool has been developed and distributed to CAR/SAM States</p> <p>Through the AP/ATM Meetings/Workshops, guidelines and/or samples of National Implementation Plans of the following CNS/ATM elements have been provided:</p> <ul style="list-style-type: none"> ➤ RNAV routes; ➤ RNP; ➤ RVSM 	Updating of the “ <i>Guidance Material towards an ICAO Global ATM Evolution in the CAR/SAM Regions</i> ” with the results of the Eleventh Air Navigation Conference and distribution to the States.

Annual goals	Achievement of results	Proposed goals of the results for the next year
<p>Immediate Objective N°1 Advise States in the planning and implementation of the transition to the CNS/ATM systems and in the definition of the most convenient options, according to the implementation schedule agreed for the CAR and SAM regions, including the specifications of the required systems and the analysis of the cost-benefit relationship of each option.</p>		
<p>1.6 The CATCs should have received guidance to establish the training programmes that the change of technology may demand.</p>	<p>A survey to collect information regarding the status of human resources in the technical and operational areas was carried among the States.</p> <p>A Seminar on CNS/ATM Human Resources and Training was carried out in Cartagena de Indias, Colombia, from 14 to 18 July 2003 with the purpose of providing information on the material developed for the Human Resources Planning Manual.</p> <p>This seminar was successfully carried out, enabling to develop a workshop in which the participants had the opportunity to practice the Work Sheets designed with the purpose of assisting CAR/SAM civil aviation administrations in the strategic planning of human resources, which allowed an important integration due to the feedback obtained by the participants through accurate remarks that will contribute to improve the above mentioned material.</p>	

Annual Goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°2 application.	Advise States in the institutional schemes for the implementation of CNS/ATM national/regional plans and their application.	
2.1 CAR and SAM Regions informed and familiarized in topics related to institutional aspects according to the CNS/ATM action plan.	A first Seminar on Institutional and economic considerations, implementation options and familiarization with planning tools was carried out.	Second CNS/ATM Seminar on institutional and economic considerations.
2.2 Analysis of institutional arrangements options in relation to CNS/ATM scenarios.	The project developed a methodology for the analysis of institutional arrangements options that will be put to the GREPECAS Institutional Aspects Task Force consideration.	Consideration of the methodology for the analysis of institutional arrangements options considered by the GREPECAS Institutional Aspects Task Force.
2.3 Feasibility study and selection of institutional arrangements options of CNS/ATM facilities and services.		
2.4 Migration strategy to the new institutional arrangements established.		

Annual Goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°3 Assist States in the implementation of the world geodetic system 1984 (WGS-84) and in improving their aeronautical information services.		
3.1 World geodetic system 1984 implemented in at least five States of the Region.	The aeronautical cartography consultant assigned to the project visited 11 States of the CAR and SAM regions to verify the implementation status of the world geodetics system WGS-84. In his mission report to each country he has included a set of recommendations to complete the tasks involved and to publish the results, requesting each administration to present a work plan in this respect to the ICAO Regional Office concerned. In two international seminars on WGS-84 coordinates, carried out in the Centro de Estudios Aeronáuticos of Bogota, Colombia, in May 2000 and July 2001, 44 specialists of 10 States and one international organization of the CAR and SAM regions were trained. It is expected that during 2002, the States of the CAR and SAM regions complete the implementation of the system and publish their results, following the project's recommendations.	According to the planning, the activities to support the States in the total and effective implementation of the world geodetics reference system WGS-84 will continue, for which a seminar/workshop mainly dedicated to provide assistance concerning the establishment of the geographical and geodesic databases for the electronic management of WGS-84 data, will be developed; as well as for the Quality Assurance of the WGS-84 data, the establishment of Geographic Information Systems (GIS) and the establishment and use of Terrain Digital Models (TDM) Systems.

Annual Goals	Achievement of results	Proposed goals of the results for the next year
Immediate Objective N°3 Assist States in the implementation of the world geodetic system 1984 (WGS-84) and in improving their aeronautical information services.		
3.2 Training of some 80 AIS officers and improvement of the aeronautical information services in at least five States of the Region.	71 AIS specialists of 10 States and one international organization of the CAR and SAM regions have been trained in the AIS/MAP systems management, in a seminar carried out in March 2000 at the Instituto de Protección al Vuelo of Brazil, in charge of ICAO and Brazilian administration speakers.	In respect of this activity of the project, the Second Seminar/workshop on AIS Systems Management is expected to be developed, which will be mainly dedicated to provide assistance in the implementation of integrated automated AIS systems; as well as to the development and implementation of quality systems (QS), programmes of quality assurance (QA), quality control systems (QC) and quality management systems (QM) in the information services and aeronautical charts (AIS/MAP).

- END -