



International Civil Aviation Organization
CAR/SAM Regional Planning and Implementation Group (GREPECAS)
Fifth Meeting of the Air Traffic Management / Communications, Navigation and Surveillance Subgroup (ATM/CNS/SG/5)
Lima, Perú, 13-17 November 2006

Agenda Item 3: General report on the activities of Regional Project RLA/98/003 – Transition to CNS/ATM Systems in the CAR/SAM Regions

General progress of project RLA/98/003 activities

(Presented by the Secretariat)

Summary
This working paper presents a general report on the activities of project RLA/98/003 regarding the Transition to CNS/ATM Systems in the CAR/SAM Regions.
References:
<ul style="list-style-type: none">• RLA/98/003 Project Document• Report of the Eighth Meeting of the Coordination Committee of Project RLA/98/003 (Lima, 27-28 February 2006)

1. Introduction

1.1 The Tenth Air Navigation Conference, held in Montreal, Canada, September 1991, expressed the need for more information in developing regions and that it was necessary to support these regions through ICAO technical cooperation projects and through other ICAO units.

1.2 Consequently, the Tenth Air Navigation Conference formulated recommendation 8/5 requesting ICAO to consider the provision of assistance to facilitate implementation of the CNS/ATM Systems, particularly in developing States.

1.3 Subsequently, the Fifth Meeting of Civil Aviation Authorities of the South American Region (RAAC/5), held in Cuzco, Peru, in 1996, based on recommendation 8/5 of the Tenth Air Navigation Conference, considered the need of establishing a technical cooperation project, aimed at supporting States in identifying and solving problems faced in the development of their CNS/ATM national plans, as well as in developing guidelines for the implementation of the referred plans in harmony with the regional plans for CNS/ATM transition within the approved methodology of GREPECAS.

1.4 Technical cooperation project RLA/98/003 was established to meet this need and has the following objectives:

- (a) advise States on the national planning for the transition to the new CNS/ATM systems in accordance with the programme agreed for the Region;
- (b) advise States on the definition of implementation options which are most appropriate for their own reality, including the definition of the required systems specifications. ;
- (c) provide States information and advise on the cost/benefit analysis regarding the implementation of the various options of the new systems, and
- (d) assist States in the implementation of the 1984 World Geodetic System (WGS-84) and the establishment of an integrated automated aeronautical information system for the Region.

1.5 As a result of the above objectives, technical experts hired by the project advise States in developing a transition plan to the new CNS/ATM systems, including human resources requirements for the operation and maintenance of the new CNS/ATM systems and appropriate training mechanisms.

1.6 The project would achieve these objectives through teams of technical experts who develop reference material and advise States that so require, in the new systems planning and implementation processes; development, conduction and recommendation of the training mechanisms to develop the necessary human resources, including participation of industry speakers; and attendance at important events by the civil aviation administrations and CNS/ATM systems users staff.

1.7 In compliance with the request of the RAAC/5, ICAO submitted the project document of the technical cooperation regional project RLA/98/003 on the Transition to CNS/ATM Systems in the SAM Region to the consideration of the administrations of the region. Subsequently, and by GREPECAS initiative, the project was also extended to the CAR Region. This project initiated its activities in December 1998, and it is estimated that its activities would be concluded by mid-2007.

2. **Results achieved by project RLA/98/003**

2.1. **Advise States on planning and implementation of transition to CNS/ATM systems.** *(Immediate objective # 1 of project RLA/98/003)*

2.1.1. Under this immediate objective, the project carried out a survey on the status of CNS/ATM facilities and services available in each State as well as of aircraft fleets, in order to carry out an analysis of the 18 principal air traffic flows in the regions. The information obtained directed the subsequent project actions on the implementation of RNAV routes, RVSM and RNP 10.

2.1.2. In this regard, an RNAV routes implementation plan was established, as well as the RVSM implementation plan and the RNP10 implementation in the Santiago de Chile – Lima segment.

2.1.3. Furthermore, the project supported the restructuring of the ATS routes network in the CAR/SAM regions, which covers 64 implemented RNAV routes, realignment/extension of 44 ATS routes, and elimination of 19 ATS routes.

2.1.4. The project will also contribute, as necessary, in developing issues that will benefit the implementation of ATM automation, mainly in the interoperability of resident applications and the future implementation in ATC automated systems, including data exchange between those systems to support the development of operational requirements (performance objectives) linked to the future ATM systems.

2.1.5. Likewise, the training of approximately 1,400 professionals in different seminars/workshops organized by the project was achieved, representing 334 months/men training.

2.1.6. Activities for performance based navigation were initiated with the support of the Project by developing a route map for short- and medium-term (CAR/SAM PBN Route Map) implementation, as well as the planning of air traffic flow management and development of a draft document on the ATFM operational concept for the CAR/SAM Regions (CAR/SAM ATFM CONOPS).

2.1.7. Likewise, a review of the CNS/ATM Plan in the CAR/SAM Regions has been initiated, taking into account the Global ATM Operational Concept and the new Air Navigation Global Plan as well as the related global plan initiatives (GPI). As a consequence of this new planning, the ATM Committee work programme is being reviewed.

2.2. Advise States on institutional schemes for the implementation of national/regional CNS/ATM plans and their application. (Immediate objective #2 of project RLA/98/003)

2.2.1. Under this immediate objective, the document “*Guidance material for the evolution towards ICAO Global ATM in the CAR/SAM regions*” that will constitute an important guidance document for the next years was developed. This document was recently updated based on the results of the Eleventh Air Navigation Conference.

2.2.2. Advisory visits to participating States were also carried out in order to provide information on the results of the project, including detailed presentations on activities to improve ATM, institutional considerations and implementation options.

2.2.3. The project also developed a software tool known as PET (Planning and Evaluation Tool) for the implementation of the CNS/ATM System which was distributed to all States. Two seminars on CNS/ATM institutional aspects have been held, and studies are being carried out to support the GREPECAS Task Force on Institutional Aspects in order to study possible alternatives to institutional arrangements of the CNS/ATM systems.

2.2.4. During the current year the Project has been working on the development of a first draft of a multinational agreement for the creation of a Regional Multinational Organization (RMO). Progress in this regard will be presented in the Task Force Meeting and Seminar on institutional aspects to be carried out in Rio de Janeiro, Brazil from 11 to 13 December 2006.

2.3. Assistance to the States in the implementation of the world geodetic system (WGS-84) and the improvement of the aeronautical information services. (Immediate objective # 3 of project RLA/98/003)

2.3.1. Under this immediate objective, an expert on WGS-84 was hired, who carried out advisory visits to the project Member States in order to verify the implementation status of the world geodetic system WGS-84. Likewise, four (4) seminars on WGS-84 coordinates and aeronautical information issues were carried out, training more than 150 specialists of the CAR and SAM regions.

3. Analysis

3.1. States have recognized that project RLA/98/003 is an important tool for implementation and for carrying out training events on critical aspects of the CNS/ATM system, and has provided active leadership in the coordination, planning and implementation process of the CNS/ATM system. It has also allowed an active and timely participation of specialists from different fields of States/International Organizations of the CAR/SAM Regions, even those who are not members of the Project, leading to implementation in the whole airspace of both regions.

3.2. Initially, Project RLA/98/003 was planned to end in 2002, however, the efficient and careful use of available resources has allowed the extension of the support to States up to mid-2007, at which point planned activities will be completed.

3.3. As mentioned before, the project successfully complied with proposed goals and is operating as an important support mechanism of the GREPECAS activities. **Appendix A** to this working paper presents the last annual report of the Coordination Committee of Project RLA/98/003. Likewise, **Appendix B** presents the updated Gantt Chart containing the work programme for 2006 including its budget.

4. Suggested actions:

4.1 The Meeting is invited to:

- a) take note of the information provided in this working paper; and.
- b) continue supporting efforts carried out by project RLA/98/003.

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APPENDIX A**ANNUAL REPORT
UNDP/ICAO RLA/98/003 PROJECT
Transition to CNS/ATM System in the CAR and SAM Regions****Project Basic Information**

Project number and title:	RLA/98/003 Transition to CNS/ATM System in the CAR and SAM Regions
Institution in charge:	ICAO
Project start date:	
Originally planned	16 July 1998
Effective	19 December 1998
Project termination date:	
Originally planned:	15 June 2001
Effective:	15 June 2007
Total budget (dollars):	
Initial amount:	2,005,100
Last revision approved:	2,420,240
Period covered by the report:	December 2004 to December 2005

PART I: NUMERICAL ASSESSMENT

Please assess the pertinence and performance of the program or project using the following scale:

1 – Completely satisfactory

2 – Satisfactory

3 – Unsatisfactory, with some positive elements

4 – Unsatisfactory

X – Not applicable

Please indicate your answers in the corresponding column.

SUBSTANTIVE APPROACH	ICAO	ARG	BOL	BRA	CHI	COL	ECU	U.S.A.	PAN	PAR	PER	VEN	COCESNA	AVERAGE
1. ¿How do you evaluate the pertinence level of the project in relation to priorities in the development of the region?	1			1	2			1		2				
2. Dados los objetivos del programa o proyecto, ¿se presta ayuda a las instituciones pertinentes?	2			2	2			X		2				
3. Using the following indicators, assess the contribution of project results to the achievement of immediate objectives:														
<i>Indicator # 1.1 Development of at least 11 CNS/ATM national/regional implementation plans.</i>	2			2	2			1		X				
<i>Indicator # 1.2 At least 3 components of CNS/ATM systems implemented.</i>	2			2	2			1		2				
<i>Indicator # 1.3 At least 1500 people would have been trained on issues related to CNS/ATM transition.</i>	1			1	1			1		2				
<i>Indicator #2.1 Availability of orientation material for the identification, validation and implementation of institutional arrangements for the CNS/ATM systems.</i>	2			2	2			1		2				

SUBSTANTIVE APPROACH	ICAO	ARG	BOL	BRA	CHI	COL	ECU	U.S.A.	PAN	PAR	PER	VEN	COCESNA	AVERAGE
<i>Indicator # 2.2</i> At least 2 regional agreements would have been celebrated for the administration of CNS/ATM systems.	2			1	1			1		2				
<i>Indicator # 3.1</i> At least 10 States will have implemented the WGS-84.	2			1	3			3		1				
<i>Indicator # 3.2</i> At least 150 AIS officers would have been trained on WGS-84	2			1	3			3		2				
4. Evaluate the achievement of the desired results.	2			2	2			2		2				
5. ¿Were the project management mechanisms adequate?	2			2	2			2		2				
6. Were project resources sufficient (financial, physical and human) regarding to:														
a) Quantity?	2			2	1			2		2				
b) Quality?	2			2	2			3		2				
7. Project resources to produce expected results were efficiently used?	2			2	2			3		1				
8. Was the project efficient regarding costs, in comparison to similar projects?	2			2	2			X		2				
9. On the basis of the project work plan, how would you evaluate the project opportunity degree regarding to:														
a) Achievement of products and initial results?	2			1	2			2		2				
b) Delivery of supplies?	2			2	2			X		2				
GLOBAL EVALUATION OF THE PROGRAM OR PROJECT	2			2	2			2		2				

Please explain the foundation of your evaluation, which does not have to be limited to the criteria of pertinence nor performance as above evaluated. This could not coincide with the above evaluation. Regarding the last year of the project, an estimation of the possible project success should be included, as well as its pertinence or performance.

The project has continued to support successfully regional implementation plans and processes:

- Implementation of RNAV routes;
- Restructuring of ATS routes;
- Operational Implementation of RNP 10 in the segment Santiago de Chile-Lima of Routes UL 302 and UL 780, and subsequent definite operational implementation after a safety assessment carried out by CARSAMMA;
- RVSM implementation in the CAR/SAM Regions and continue maintenance and monitoring of operational safety subsequent to the implementation, through valuation of collision risk for operations in route of CAR/SAM Regions in order to guarantee the achievement of the established operational safety objectives;
- Analysis and evaluation of the large deviation altitude of 300 ft. or more;
- Development of strategic orientation guidelines for the RNAV/RNP implementation processes for phases of in route flight, terminal area and approximation under the new concept of performance-based navigation (PBN).

All these plans and programmes have been executed through Meetings/Workshops of Air Traffic Management Authorities and Planners in the CAR/SAM Regions, making possible that the Administrations acquire experience in the planning and implementation processes of RNAV routes, RNP and RVSM; which has contributed to a notable improvement of the regional coordination process.

On the other hand, the project supported the study of the CNS/ATM system institutional aspects through the Third CAR/SAM Seminar on Institutional Aspects (19 September 2005, Caracas, Venezuela).

In this seminar, 21 delegates participated of 6 States and one international organization (COCESNA).

The results of the Seminar were discussed in the Second Meeting of the GREPECAS Task Force on Institutional Aspects, and were used to formulate actions to be carried out by the Regional Group and update the activities of the referred Task Force, synchronizing these activities with those of the project.

The Tenth Meeting/Workshop of Air Traffic Management Authorities and Planners in the CAR/SAM Regions was carried out (Lima, Peru, 10-14 May 2005), with the participation of 8 States of the CAR Region, 13 States of the SAM Region, as well as 6 international organizations, AITAL, ARINC, COCESNA, IATA, IFALPA and IFATCA, totaling 89 participants.

Also, the Third CAR/SAM Seminar on RNP Implementation was carried out (26 and 27 September 2005, Lima, Peru) where 5 States of the CAR Region and 10 States of the SAM Region participated, as well as 5 international organizations: AITAL, ARINC, COCESNA, EUROCONTROL, IATA and IFALPA. Likewise, 4 airlines participated in the seminar, AVIANCA and LAN CHILE, and one aircraft manufacturer, BOEING; totalling 96 participants.

Though not under the auspices of project RLA/98/003, immediately after RNP Seminar above mentioned, the Eleventh Meeting/Workshop of Air Traffic Management Authorities and Planners in the CAR/SAM Regions was carried out (AP/ATM/11), continuing with the works under process.

Finally, and under the auspices of project RLA/98/003, the Twelfth Meeting/Workshop of Air Traffic Management Authorities and Planners in the CAR/SAM Regions was carried out (AP/ATM/12) in Lima, Peru, from 15 to 19 May 2006. This counted with the participation of 6 States of the CAR Region and 11 States of the SAM Region, as well as with 6 international organizations: ALTA, ARINC, COCESNA, COPA, IATA and LAN CHILE, totalling 71 participants.

Besides continuing with the RNAV routes implementation, extension, realignment, partial or total elimination proposed by States and international organizations, this meeting made possible the revision of operational safety assessment of reduced vertical separation (RVSM), which reflects operations safety one year after RVSM implementation in air space of CAR/SAM regions carried out on 20 January 2005.

Also, actions for the implementation of performance-based navigation (PBN) actions in the short (2005-2010) and medium-term (2011-2015), included the PBN Map Route as well as with issues related with CNS infrastructure, earth/air communications, analysis of navigation capacity of the fleet and navigation specifications in CAR/SAM regions and of an agreement between Brazil and Uruguay to initiate a feasibility study for the RNAV5 implementation in FIRs Brasilia, Curitiba and Montevideo.

PART II: DESCRIPTIVE EVALUATION

1. Which were the principal achievements of the project in terms of expected results, during the year covered by the evaluation? As possible, please include an evaluation in terms of possible effects, of sustainability, and of contribution to capacity development.

With respect to the ATM of the project, this has been an excellent tool for the development of the following programmes:

- Restructuring of the ATS Routes Network of the Air Navigation Plan of the CAR/SAM Regions, that covers:
 - Inclusion of 15 RNAV routes;
 - Re-alignment/extension of 44 ATS routes;
 - Elimination of 19 ATS routes; and
- RNP 10 Operational Implementation in the segment Santiago de Chile – Lima of parallel routes UL 302 and UL 780, successfully implemented on 22 January 2004 and operationally implemented on 25 November 2005.
- Implementation of the Reduced Vertical Separation Minima (RVSM) in the CAR/SAM Regions, successfully carried out on 20 January 2005.
- Initial planning and programming of performance-based navigation implementation (PBN).

The achievement of these objectives is permitting the increment of airspace capacity, a better management of the traffic flows and a significant saving of fuel use.

On the other hand, through the seminars and advisory missions to the States training has been offered to more that 950 officers of the different Administration responsible for the CNS/ATM systems transition.

Also, the project has started incursions in other areas of importance for the CNS/ATM implementation, such as the institutional aspects and the automation of air navigation services. Through the seminars on institutional aspects and the studies being carried out by the experts hired by the project, the GREPECAS Institutional Aspects Task Force is being supported, as well as the activities of the ATM Committee of GREPECAS ATM/CNS Subgroup, in the formulation of actions by the Regional Group, as well as in the update of activities, synchronizing them with those of the project. These activities will permit to develop agreements for the establishment of multinational systems and to continue with the implementation of ATM initiatives.

In the same way, the first seminar on automation of the future air navigation systems has identified the need to carry out a technical-operational evaluation of the existing ATM automated systems in order to implement a platform for pre-operational tests, which will facilitate the development of the air navigation services automation, work that will be carried out in coordination with the GREPECAS ATM/CNS Sub-Group.

2. Which were the principal questions and problems that influenced in the achievement of the project results?

The project is practicing an active leadership in the process of coordination, planning and implementation of CNS/ATM elements, which is making possible an active and time participation of ATM, CNS, Operations and Airworthiness Specialists of States/International Organizations of CAR/SAM regions, even of those that do not participate in the Project.

However, to achieve a better regional effectiveness it is required a better participation of the States in the Project in order to continue with the implementation of CNS/ATM elements related to the processes of automation and to the establishment of multinational systems.

3. How should these issues or problems be solved? Please thoroughly explain the action or actions recommended. Please specify who should be in charge of these actions. Also please indicate a provisional calendar and resources necessary

The Meeting of Civil Aviation Authorities of the South American Region has requested ICAO the reaction o new regional technical cooperation Project to support the Region in the implementation of elements conforming the Global ATM concept. Project RLA/98/003 member and non-member States would be able to find in this new Project an important tool for the support of the CNS/ATM elements implementation.

4. What new events (if they were to occur) would probably affect the achievement of project results? What do you recommend to respond to these events?

The project has achieved expected results.

5. Which are the opinions of the States concerning the project? Please indicate any significant difference on the basis of gender issues, as regards these opinions.

According to evaluations carried out in previous years and due to the successful RVSM implementation, as well as due to the optimization of the CAR/SAM regions routes network and to the progress reach in planning towards PBN implementation, States have identified the project as an important implementation tool and for carrying out training events on critical aspects of CNS/ATM.

6. To date, what learning (positive or negative) can be extracted from the experience of the project?

Regarding ATM, the project has turned to be a discussion forum where decisions regarding implementation planning process are made, making possible an active participation of most of the States/International Organization involved in the process of implementation of CNS/ATM elements, even of those which are not members of the project. Likewise, the project is making possible that ATM Authorities and Specialists of the CAR/SAM regions obtain more experience in the implementation process. This experience is being transferred to their particular needs of local implementation. Also, the regional coordination process has been improved and it is contributing to eliminate some ATM and CNS deficiencies, such as Georgetown Area Control Implementation and the Georgetown Control Center (ACC) in Guyana, having achieved that the whole Upper Airspace of the CAR/SAM Regions be controlled airspace covered by the Air Traffic Control Service. Likewise, the increment of the

communications coverage in some FIRs has been achieved. In the same way, Civil/Military Coordination has been improved, and it has been possible to eliminate or modify Restricted or Prohibited Areas in some of the States of the CAR/SAM Regions, which enables RNAV routes to over fly these areas giving more capacity to airspace.

7. Do you propose any significant revision to the support document of the project document? If affirmative, what are these revisions? Please justify.

It is not necessary to carry out any substantive revision to project document at this moment.

8. Provide any other information that can support or clear out your evaluation of the project. You can include annexes if necessary.

PARTE III: Cuadro sinóptico del proyecto

Title and number of the program or project:	RLA/98/003 – Transition to CNS/ATM systems in CAR/SAM regions	Management dispositions:	
Designated institution:	ICAO	Period covered:	December 1998 to November 2006
GLOBAL EVALUATION			
The project is achieving its principal objective which is to provide assistance to the States in the CAR/SAM regions in the implementation of the transition plan to CNS/ATM new systems according with the air navigation regional plan.			
FINANCIAL SUMMARY			
Funding Source	Budget (thousand dollars)	Expenditures (thousand dollars)	Execution Rate (%)
The following Governments participated in the funding of expenditures:	--N/A--	302.4 (1999)	N/A
Argentina 200,500.00	--N/A--	298.2 (2000)	N/A
Bolivia 200,500.00	--N/A--	311.1 (2001)	N/A
Brasil 200,500.00	--N/A--	259.0 (2002)	N/A
Chile 200,500.00	--N/A--	343.9 (2003)	N/A
Colombia 200,500.00	--N/A--	335.3(2004)	N/A
COCESNA 200,500.00	--N/A--	204.2 (2005)	67%
Ecuador 200,500.00	304.3		
Panamá 200,500.00			
Paraguay 200,500.00			
Perú 200,500.00			
Estados Unidos 200,500.00			
Venezuela 200,500.00			
Intereses 14,120			
TOTAL 2,420,240.00			

RESUMEN DE LOS RESULTADOS		
Objetivos inmediatos	Indicadores	Logros
<p>Immediate objective No. 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 Development of at least 11 CNS/ATM national/regional implementation plans</p>	<p>Most of the States/International Organizations have elaborated their respective CNS/ATM National Plans, some are presently in process of revision and other in process of approval by their corresponding national authorities.</p> <p>Specifically, the RNAV Routes Implementation Plan and the RVSM Implementation Plan are Regional Plans that involve all the States/Organizations of the CAR/SAM regions, and the RNP 10 Implementation in the Segment Santiago de Chile-Lima of parallel routes UL 302 and UL 780, involves now Peru and Chile.</p> <p>Performance-based navigation (PBN) planning and programming also involves all CAR/SAM States/international organizations, though according to agreement implementation will be done independently in each Region.</p>
	<p>Indicator # 1.2 At least (3) three CNS/ATM systems components implemented</p>	<p>Restructuring of the ATS Routes Network in the CAR/SAM regions Up to January 2006:</p> <ul style="list-style-type: none"> ○ 64 RNAV routes implemented; ○ Realignment /extension of 44 ATS routes; ○ Elimination of 19 ATS routes. <ul style="list-style-type: none"> ● Operational Implementation RNP 10 in the segment Santiago de Chile-Lima of parallel routes UL 302 and UL 780, successfully in force since 22 January 2004 and operationally implemented on 25 November 2005. ● RVSM Implementation in the CAR/SAM regions in process, planned for 20 January 2005.
	<p>Indicator # 1.3 At least 1500 persons would have received training on matters related to CNS/ATM transition.</p>	<p>Training to 1,541 persons has been imparted in the different meetings/workshops organized by the project, corresponding to 364 months/men training.</p>

RESUMEN DE LOS RESULTADOS		
Objetivos inmediatos	Indicadores	Logros
<p>Immediate objective No. 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 Availability of guidance material for the identification and validation and implementation of institutional arrangements for CNS/ATM systems.</p>	<p>The document of “<i>Orientation material for the evolution towards ICAO Global ATM in the CAR/SAM regions</i>” has been completed and distributed to the States.</p>
	<p>Indicator # 2.2 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 that is already carrying out the evaluation and monitoring of airspace safety in both regions, the Operational Implementation of RNP 10 in the segment Santiago de Chile-Lima in parallel routes UL 302 and UL 780, and the treatment of issues related with RNAV and RNP under the PBN concept and strategy to follow for inroute and terminal area operations, as well as IFR approximation in CAR/SAM regions.</p>
<p>Immediate objective No. 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 At least 10 States will have WGS-84 implemented.</p>	<p>Argentina, Brazil, Chile, Colombia, Ecuador and Peru have satisfactorily implemented the WGS-84</p>
	<p>Indicator # 3.2 At least 150 AIS specialists would have received training on WGS-84.</p>	<p>117 AIS officers have received training on the WGS-84. Additionally, advisory to the States members of the project visits were carried out by a geodesy expert.</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.		
Annual milestones	Annual milestones	Proposed milestones
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, all the CAR/SAM States provided the required information concerning the present infrastructure of their area control centers, as well as the statistical information on air traffic in the principal ATS routes analyzed by the project, corresponding to the 18 principal air traffic flows previously identified in the CAR/SAM Regional Plan for the CNS/ATM Implementation approved by the CAR/SAM Air Navigation Planning and Execution Regional Group (GREPECAS).	
1.2 Officers responsible for the transition trained in the strategy of planning the change to the new systems..	<p>Information and orientation has been provided to 959 officers of 27 States, 4 international organization 6 airlines on planning methodology and new systems of communications, navigation and surveillance and air traffic management (CNS/ATM) implementation and in airspace planning.</p> <p>Twelve meetings/workshops of ATM authorities and planners for the implementation of RVSM, RNAV and RNP, and one seminar on RNV implementation have been carried out.</p> <p>The first seminar on air navigation systems automation was carried out.</p> <p>Three seminars on institutional and economical aspects of CNS/ATM systems have been carried out.</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.		
Annual milestones	Annual milestones	Proposed milestones
1.3 Updated regional action plan for the implementation of the CSN/ATM systems.	<p>The project established a plan of action to be carried out in four phases, for the analysis of the 18 principal air traffic flows identified in the Air Navigation Plan for the CAR/SAM regions, in order to determine the future requirements of the CNS system in relation to the air traffic demand, and to propose immediate technical and operational improvement measures as well as scenarios for the transition development, including a cost-benefit study on the different implementation possibilities, the analysis of the training and human resources requirements, the study of the institutional aspects involved, and the production of planning and evaluation tools.</p> <p>The evaluation of the 18 flows has been completed, which has indicated that the introduction of air navigation routes (RNAV) and required navigation performance (RNP) values would provide immediate advantages through the reduction of flight time and of the capacity of flying at the preferred levels of flight. Also, the necessary information for the elaboration of traffic flow profiles to be used in the development of scenarios and State profiles has been produced for the planning of transition stages and for the negotiation with service suppliers and users, including the selection of technical and operational solutions.</p>	
1.4 National air navigation plans updated including the transition to the CNS/ATM systems..	<p>The CAR and SAM States have initiated the update process of their respective air navigation national plans, including transition to the CNS/ATM systems and their harmonization with the regional plan, following guidelines established in this regard in the concerning ICAO documents.</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.		
Annual milestones	Annual milestones	Proposed milestones
1.5 Assistance in the preparation and execution of CNS/ATM elements/systems implementation plans provided	<p>The document on “<i>Orientation Material for the evolution towards the ICAO Global ATM in the CAR/SAM regions</i>” has been completed. Advisory visits to States participating in the project have been carried out in order to inform about the project results and activities state of implementation; also, detailed presentations on activities to improve ATM have been performed, as well as institutional considerations and implementation options of the PET software (Planning and Evaluation Tool).</p> <p>CDs containing the PET tool have been produced and distributed to all States participating in the project.</p> <p>Through the AP/ATM Meetings/Workshops orientations guides and/or models for the Implementation National Plans of the following CNS/ATM elements have been made available:</p> <ul style="list-style-type: none"> ➤ RNAV routes; ➤ RNP; ➤ RVSM <p>The document “<i>Orientation Material for the evolution towards the ICAO Global ATM in the CAR/SAM regions</i>” has been updated considering the results of the Eleventh Conference on Air Navigation and distributed to the States.</p>	<p>Conclude information collection on existing CAR/SAM systems, in order to implement data exchange between automated systems.</p> <p>Elaborate a generic technical/operational document for interphase control to be adapted according to needs.</p> <p>Elaborate implementation procedures and a short- and medium-term plan of action for the interconnection of automated systems in the CAR/SAM regions.</p> <p>First Meeting/Workshop of Automated Air Navigation Services.</p> <p>CAR/SAM Seminar on ATN Development and Applications.</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.		
Annual milestones	Annual milestones	Proposed milestones
1.6 The CATCs should have received guidance to establish the training programmes that the change of technology may demand.	<p>A survey was carried out among the States to compile information in the technical and operational areas on the human resources situation.</p> <p>A seminar on CNS/ATM system Human Resources and Training was carried out in Cartagena de Indias, Colombia, from 14 to 18 July 2003 in order to provide information about the material that had been developed for the Human Resources Planning Manual.</p> <p>The referred seminar was carried out successfully, making possible to develop a workshop in which delegate participants had de opportunity to practice on the Work Sheets prepared to support the civil aeronautical administrations of the CAR and SAM regions in strategic planning of human resources, which permitted an important integration due to feedback obtained from participants precise observations that contributed to improving the referred material.</p>	

Immediate Objective No. 2 Advise States in the institutional schemes for the implementation of CNS/ATM national/regional plans and their application.		
Annual milestones	Annual milestones	Proposed milestones
2.1 CAR and SAM Regions informed and familiarized in topics related to institutional aspects according to the CNS/ATM action plan.	<p>A first seminar out about institutional and economical considerations, implementation options and familiarization with planning tools was carried.</p> <p>In year 2005, the Third Seminar on Institutional Aspects of CNS/ATM systems was carried out</p>	
2.2 Analysis of institutional arrangements options in relation to CNS/ATM scenarios.	<p>The project developed a methodology for the analysis of the options of institutional arrangements that will be submitted to consideration of the GREPECAS Institutional Aspects Task Force.</p> <p>The GREPECAS Institutional Aspects Task Force acknowledged the methodology developed by project RLA/98/003 for the analysis of the institutional arrangements options.</p> <p>An institutional aspects expert was hired to carry out studies on this issue and to support the GREPECAS Task Force on institutional aspects in decision 12/5.</p>	

Immediate Objective No. 2 Advise States in the institutional schemes for the implementation of CNS/ATM national/regional plans and their application.		
Annual milestones	Annual milestones	Proposed milestones
2.3 Feasibility study and selection of institutional arrangements options of CNS/ATM facilities and services.	Some PET models were improved. ICAO used this work for the development of an improved tool.	Translate support material of software Developer by ICAO headquarters.
2.4 Migration strategy to the new institutional arrangements established.	GREPECAS approved conclusion 13/2 on operacional scenarios in CAR/SAM regions	<p>Regional strategy for the future implementation of an institutional arrangement with regional characteristics.</p> <p>Develop a model of institutional agreement with the corresponding legal bases for the administration and operation of air navigation services under the concept of ICAO CNS/ATM system.</p> <p>Approval of the model and its legal bases.</p>

Immediate Objective No.3 Assist States in the implementation of the world geodetic system 1984 (WGS-84) and in improving their aeronautical information services.		
Annual milestones	Annual milestones	Proposed milestones
3.1 World geodetic system 1984 implemented in at least five States of the Region.	<p>The consultant on aeronautical cartography assigned by the project visited 11 States of the CAR and SAM regions in order to verify the implementation situation of the world geodesic system WGS-84. In the reports of his missions to each country he has included recommendations to complete the inherent tasks and to publish the results, requesting each administration the presentation of a work plan in this regard to the corresponding ICAO Regional Office. In two international seminars about the WGS-84 coordinates, carried out in the Aeronautical Studies Center of Bogotá, Colombia, in May 2000 and in July 2001, 44 specialists of 10 States and 1 international organization of the CAR and SAM regions have been trained.</p> <p>In December 2003 The WGS-84 Workshop for the CAR/SAM Regions was developed to attend in a direct way the need of the pertinent States on the implementation requirements of the WGS-84 system vertical elements, including basic concepts about ellipsoid and geoids models and their close interrelation; MSL concepts, orthometric height, WGS-84 ellipsoidal heights and about geoids WGS-84 undulations; care to be given to the execution of post process calculations to determine data on WGS-84 geoids undulations and the application of adequate electronic tools in the phases of the process and post-process for determining the data on the orthometric heights and the WGS-84 ellipsoidal heights and the WGS-84 geoids undulation; and Methods for ensuring the quality of the WGS-84 geoids undulation data to be published.</p>	

Immediate Objective No.3 Assist States in the implementation of the world geodetic system 1984 (WGS-84) and in improving their aeronautical information services.		
Annual milestones	Annual milestones	Annual milestones
3.2 Training of some 80 AIS officers and improvement of the aeronautical information services in at least five States of the Region.	Training has been imparted to 71 AIS specialists of 10 States and 1 International organization in the CAR and SAM regions in the management of the AIS/MAP systems, in a seminar carried out in March 2000 in the IPV Brazil, in charge of lecturers from ICAO and of the Brazilian administration. .	

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