International Civil Aviation Organization

UNDP/ICAO REGIONAL PROJECT RLA/98/003
Transition to the CNS/ATM in the CAR and SAM Regions

Report of the Fourth Coordination Meeting
(Lima, Peru, 4 and 5 December 2001)

I. GENERAL

1. PLACE AND DURATION OF THE MEETING

1.1 The Fourth Coordination Meeting of the RLA/98/003 Regional Project was carried out at the ICAO South American Regional Office, Lima, Peru, on the 4 and 5 December 2001.

2. OPENING

2.1 The Regional Director of the ICAO SAM Office, Mr. Sr. José Miguel Ceppi, welcomed the States and International Organization' representatives and ICAO officers. He emphasized the importance of the regional project in the coordinated implementation of the CNS/ATM systems and the role of the Coordination Committee in achieving the objectives outlined and expressed his wish that this meeting reaches the same success as previous ones.

2.3 Afterwards the International Project Coordinator, Mr. Walter Amaro, greeted the attendants and started the meeting.

3. ORGANIZATION OF THE MEETING

3.1 The meeting was chaired by the International Project Coordinator, Mr. Walter Amaro, Chief of the Filed Operations Section for the Americas of the ICAO Technical Cooperation Bureau, assisted by Mr. José Miguel Ceppi, Regional Director, ICAO SAM Office, Mr. José A. Díaz de la Serna, Deputy Regional Director, ICAO NACC Office and Mr. Oscar Quesada-Carboni, Technical Cooperation Regional Coordinator of the SAM Office, assisted by Messrs. Carlos Stehli, CNS Officer and Mr. Jorge Fernández, ATM Officer of the SAM Office and Mr. Aldo Martínez, CNS Officer of the NACC Office.

4. AGENDA

4.1 Item 1: Approval of the Agenda

Item 2: Review of the third meeting report

Item 3: Status of States' support to the project and deposit of contributions

Item 4: Report on the results achieved through the program of project activities during 2001

Item 5: Tentative program of project activities for 2002

Item 6: RLA/98/003 Project Document Revision

Item 7: Other matters

5. PARTICIPANTS

BRAZIL	Ronaldo Ney Telles Belchior de Oliveira Ary de Almeida Portela
CHILE	Luis Ili Salgado Lorenzo Sepúlveda Biget
ECUADOR	Bolívar Dávalos Cárdenas
PERU	Alfredo Bedregal Oyague Miriam Valverde
UNITED STATES	Drazen Gardilcic Carey Fagan
VENEZUELA	Leonardo Torres Yepez
COCESNA	José Ramón Oyuela Martínez
ICAO	José Miguel Ceppi José Díaz de la Serna Walter Amaro Carlos Stehli Jorge Fernández Aldo Martínez Oscar Quesada

II. DISCUSSION

Item 1: Approval of the Agenda

1.1 The Agenda for this meeting was approved without observations, as shown in paragraph 4 supra.

Item 2: Review of the third meeting report

2.1 Under this agenda item, a complete review of the third meeting report of the RLA/98/003 Coordination Committee held in Miami, Florida on 28 November 2000 was carried out, expressing conformity and approving it.

Item 3: Status of State's support to the project and deposit of contributions

3.1 The meeting took note that according to mandatory revision "E" of the project budget, approved by UNDP on 25 May 2001, the project total cost is maintained in US$2,205,610.

3.2 In addition, the meeting also noted that so far contributions of Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Panama, Paraguay, Peru, United States, Venezuela and COCESNA had been received.

3.3 At the same time, the politics on the degree of participation of the CAR and SAM States that are not part of the project was reviewed. In this respect, the meeting after an extended discussion agreed to maintain the politics on the participation of specialists of non-contributing States' in the planning and implementation activities that involve the whole region and that the non-participation of any of the States could risk the success of the activities.

3.4 Additionally, ICAO was urged to make all the necessary efforts in order to obtain the support of the States that are not yet part of the project and to request the UNDP the devolution of the interests generated by the project's funds, as with this funds the participation of non-contributing States specialists can be financed in order to accomplish project RLA/98/003 objectives at a regional level.

3.5 The meeting also took note of the expenditures incurred since the beginning of the project. This information was presented as a table showing the expenditures of the project by budget line taken from the project budget revision and including the expenditures estimated for 2001. The meeting expressed that it would be convenient for States and participating entities to count with the breakdown of the expenses, in this sense the meeting requested ICAO to present such breakdown on each of the activities performed during the year in the next coordination meeting.

Item 4: Report on the results achieved through the program of project activities during 2001

4.1 At the beginning of this agenda item, a revision of the program of activities approved for the present year was made and, afterwards, its execution was reviewed.

4.2 In relation with the referred program, the following activities were carried out:

a) Assistance of the Aeronautical Cartography Consultant, Eng. Héctor Mora, to the Central American States from 11 March to 3 May 2001, to verify the WGS-84 data and publication of

the WGS-84 data and information already compiled and preparation of the required aeronautical charts. (See **Appendix D**)

b) Evaluation of the main air traffic flows included in Phase III and preparation of Phase IV by the team of specialists CNS, N. Ostiguy and ATM D. Menezes and J. Moreno. (See **Appendix E**)

TF1	Buenos Aires / Santiago
TF2	Buenos Aires / Sao Paulo – Rio de Janeiro
TF3	Santiago / Sao Paulo – Rio de Janeiro
TF5	Lima / Sao Paulo – Rio de Janeiro
TF13	North of South America / Europe
TF14	Mexico / Europe
TF16	Central America / Europe
TF17	Buenos Aires / South Africa
	Sao Paulo – Rio de Janeiro / South Africa
TF18	Santiago / Easter Island – Papeete

c) With the assistance of the Economics/Cost-Benefit Analysis Consultant in January 2001, the navigation aids (Navaids) database was completed and verified, the templates for the non-database oriented CNS/ATM elements (staffing, infrastructure, etc) were developed, selection process for the development of scenarios was elaborated and cost explosion routines were completed. In November and December 2001, the interfaces to the new cost/benefit and sensitivity analysis, the scenario development process fine-tuned and preliminary scenarios are being developed. In addition, course material for the forthcoming seminar on Institutional Aspects will be prepared.

d) RNAV trials and demonstrations and pre-operational tests of RNAV procedures were initiated in November 2000 and are foreseen to finalize in July 2002. The ATM specialist, Mr. José Moreno, assisted in the preparation of the trials and demonstrations evaluation carried out during the implementation of RNAV routes UT780, UT795 and UT799. During the second meeting of ATM authorities and planners held in Lima from 14 to 18 May 2001, the new trials and demonstrations on routes UT655, UT776, UT419 and UT410 were planned. (See **Appendix F**)

e) The assignment of the Institutional Aspects Consultant related to the CNS/ATM systems implementation has been postponed to 2002.

f) Seminar on the implementation of CNS/ATM facilities and services (10 to 14 September 2001) with lecturers from AENA, ALCATEL, ALENIA, ARINC, Boeing, DISC, EUROCONTROL, FAA, IATA, Iceland Telecom, Infolution, ISI, Lockheed, Pontificia Universidad Bolivariana, SEEE, SITA, SWEEDAVIA, UAEAC, Univ. de los Andes and ICAO and the participation of 197 specialists from Argentina, Bolivia, Colombia, Dominican Republic, Ecuador, El Salvador, Guatemala, Guyana, Haiti, Jamaica, Panama, Paraguay, Peru, United States, Venezuela and COCESNA.

g) Second Meeting/Workshop of ATM authorities and planners from CAR and SAM regions (Lima, 14 to 18 May 2001), with the participation of 44 specialists from Argentina, Bolivia, Brazil, Chile, Colombia, Cuba, Dominican Republic, Ecuador, Guyana, Haiti, Jamaica, Mexico, Netherlands Antilles, Panama, Paraguay, Peru, Suriname, Trinidad & Tobago, United States, Uruguay, Venezuela, COCESNA, IATA and SITA.

h) The Seminar on Reduced Vertical Separation Minima (RVSM) was postponed to August 2002.

i) International Seminar on World Geodetics System WGS-84 and MDE (Santafé de Bogota from 9 to 18 July 2001) with Messrs. R. Jean Francois, H. Mora Páez, I. A. Lizarazo Salcedo and Myriam Ardila as lecturers and the participation of 28 specialists from Argentina, Brazil, Bolivia, Colombia, Cuba, Dominican Republic, Ecuador, Guatemala, Panama and COCESNA.

4.3 When analyzing the results obtained in the RNAV trials and demonstrations, the meeting considered convenient to request IATA the information on the savings obtained in the implementation of RNAV routes UT780, UT795 and UT799 in order to compare them with the estimates of the project.

Item 5: Tentative program of project activities for 2002

5.1 **Introduction**

5.1.1 As the first three phases of the evaluation of the 18 traffic flows identified by GREPECAS have been completed, Phase IV will consist in consolidating the requirements preparing for the development of implementation scenarios and for the evaluation of technical and operational solutions, including their viability and the proper moment to assume them.

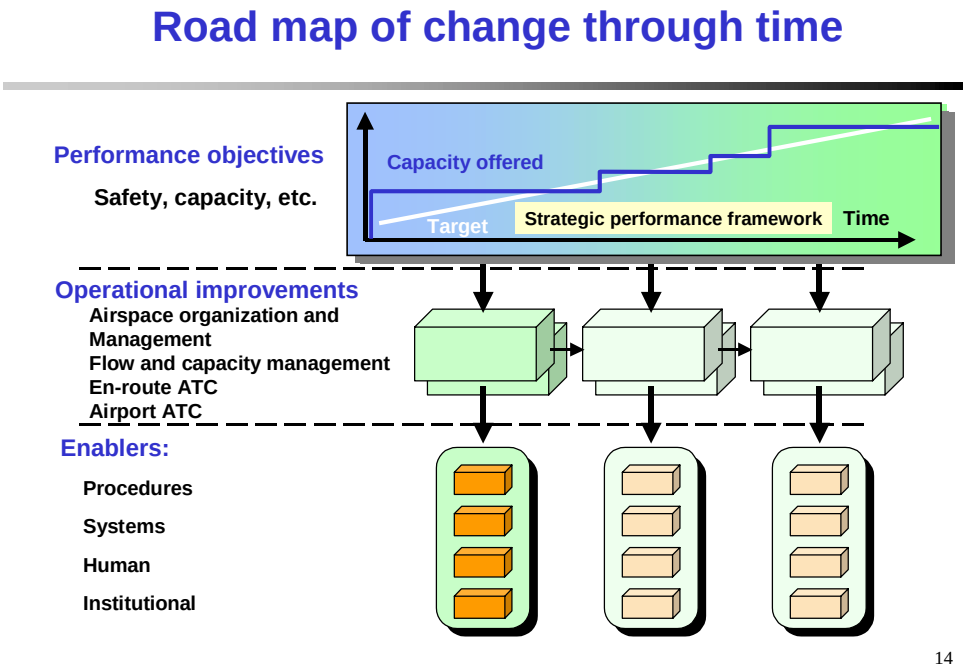
5.1.2 The final result will consist mainly in the establishment of an action plan and business cases for the implementation of CNS/ATM systems in the CAR and SAM regions. To this effect, a methodology for the determination and consolidation of regional and national requirements has been established. Furthermore, considering the magnitude of the task and the time that will be necessary to carry out the coordination among States and user groups, the activities of Phase IV have been detailed and re-distributed in two additional stages, as follows.

5.2. **Phase IV**

5.2.1 Using as a base the information produced under the first three phases, the project is developing operational concepts along with the setting of objectives, of strategies to meet those objectives and the identification of systems enablers, services and procedures necessary to achieve them.

5.2.2 The required operational concept describes the global, regional and national environment of the future ATM emphasizing compatibility and harmonization. It also identifies the available technical options capable to satisfy the strategic objectives of the operational concept. The strategic proposes new ways of confronting the problem and general guidelines to achieve the desired concept, including a series of complementary and stepped operational improvements.

5.2.2 The following diagram shows the referred process, which development will involve two additional stages, as expressed hereafter.



5.2.4 **Traffic flow profiles**

5.2.4.1 In the execution of Phase IV, the project proposes to develop **each air traffic flow profile** in order to identify the future demand, based on peak days and peak hours and in the shortcomings and deficiencies.

5.2.4.2 Based on the above, objectives will be established, strategic developed and the way and means to identify such objectives will be identified.

5.2.4.3 Air traffic profiles will provide a vision of the requirements of each State, will facilitate the coordination among States and users and will ensure that every participant in the flow agree their improvements to minimize costs and maximize benefits.

5.2.5 **States' profiles**

5.2.5.1 Considering the capability, coverage and cost of the new systems, a very close coordination among States and users groups will be necessary to ensure a concurrent and timely implementation of the systems elements and procedures. Recalling that even though much of the benefits will be achieved in the main traffic flows, the integration of national requirements and the facilities and services rationalization will have an important role en the improvement of flight efficiency and in the reduction of ATM units costs.

5.2.5.2 In order to facilitate this aspect of the coordination and negotiations that will be necessary with States and users groups, States profiles should be produced to provide an overall vision of the regional and national requirements for each State and the possible solutions and means to accomplish such requirements and, at the same time and as possible, integrating, rationalizing and harmonizing the facilities and services. These **States profiles** will help to every purpose, including regional and national plans integration.

5.3. Phases V and VI

5.3.1 **Phase V** will consist mainly in the development of implementation scenarios using different technical and operational solutions, each of which is to be analyzed through a costs/benefits model to verify their viability. These initial scenarios will be discussed with the different stakeholders, especially States to ensure that national requirements and concerns are properly addressed and adjusted as necessary.

5.3.2 This last process will need numerous iterations with all stakeholders involved before a consensus is reached. Finally, the specific detailing of the actions required for the implementation will be produced. Considering that the time required for Phase V would span over many years, their activities were split into functional units in order to keep the project manageable and have the activities organized around major functions.

5.3.3 In order to support the execution of the required activities, a CNS/ATM Institutional Expert will be included in the project group of consultants to establish and maintain direct contact with State's administrations and planners and secure the necessary consensus on operational solutions, implementation options and their timing.

5.3.4 Finally, **Phase VI** will consist in the establishment of the ATM implementation details and of the related CNS facilities and services.

5.4. Activities involved

5.4.1 The activities involved in the implementation of phases IV, V and VI are:

Phase IV Development and evaluation of implementation scenarios, including:

- Development of "Flow Profiles"
- Development of objectives on a per flow basis
- Establishment of strategies for their achievements
- Identification of technical and operational solutions
- Development of scenarios using different solutions and implementation options
- Development of cost/benefit analysis to evaluate the viability of each flow profile and determine the proper time for the transition

- Development of sensitivity analysis to identify most critical elements.

Phase V Refinement of scenarios with all concerned stakeholders with a view to secure consensus and necessary commitments. This phase includes the following activities:

- Discussion with States to verify that all their requirements and needs are adequately covered
- Refine as necessary the scenarios and perform cost/benefit analysis
- Discussions with stakeholders to secure their consensus and commitments
- Scenarios refinement and performance of a new cost/benefit analysis, repeating the process iteratively as necessary
- Development of business cases
- Documentation and agreements.

Phase VI Its activities include:

- Detailing the necessary actions for the execution of the implementation, including milestone and responsible organisms
- Monitor the progress made on the projects
- Develop and/or supervise the necessary quality control functions
- Secure or verify that appropriate certifications are secured.

5.5. **Seminars and workshops**

5.5.1 In order to achieve project objectives, there is a continuous need to carry out seminars and workshops to assist States in their planning and execution activities. With that purpose, the following events are planned for 2002:

a) **CNS/ATM, Institutional and Economic Considerations.** A seminar/workshop on the institutional and economic issues related to the implementation of the new CNS/ATM systems, on the first semester of 2002, with the following main objectives:

- Discuss ways and means of implementing CNS/ATM systems using different options or arrangements (multinational facilities, delegation of authority, etc.) including the legal framework;
- Familiarize planners with the CNS/ATM evaluation and planning tools; and

- Familiarize planners with the development of business cases.

b) **RVSM.** Recognizing the great potential of the reduced vertical separation minima (RVSM) in resolving some of the congestion problems and allowing more aircraft to fly at their preferred flight levels, a seminar/workshop on RVSM is planned to be held during the last part of the first semester in order to familiarize States with the planning and implementation of RVSM, including planning criteria and concerned procedures. In addition, two meeting/workshops to follow up RVSM and RNP10 implementation actions will be carried out.

c) **Human Resource and Training.** Human resources and training constitute a key element in the planning of the transition to CNS/ATM systems. Taking this into consideration, a seminar on Human Resources and Training has been scheduled for the middle of the first semester with the following objectives:

- Inform States of the new requirements on personnel profiles, training facilities and courses available.

- Review issues related to the transition considering that conventional and new systems will have to be operated in parallel.

- Staffing level adjustment throughout the different phases of implementation.

5.6.1 Considering the above, the coordination committee approved the tentative program of project activities enclosed as **Appendix A**. **Appendixes B** and **C** show the Gantt diagrams and Resources Graphic identifying the activities and their schedule.

5.6.2 In addition, the Committee requested the inclusion of an activity to prepare a plan for the establishment of a Monitoring Office in Brazil for RVSM activities.

5.6.3 The Committee considered necessary for States to receive a breakdown of the estimated costs for each activity for the civil aviation authority information and follow up. It was agreed that ICAO will submit the costs information required as soon as possible and this will be done in future meetings of the Coordination Committee.

VDL/CPDLC trials and demonstrations

5.6.4 The meeting review a working paper presented by the Presidents of GREPECAS and the ATM/CNS Group for the project to consider within its activities the inclusion of VDL/CPDLC trials and demonstrations in accordance to Decision 10/66 of the GREPECAS meeting. In this regard, the meeting also took note of a proposal from Colombia to carry out trials and demonstrations with VDL Mode2 during the next 24 months.

5.6.3 The meeting thoroughly discussed this matter taking into account that:

a) The avionics for the ATN VDL mode 2 sub-network is under development and results in this regard from projects from the United States and Europe are expected.

b) The ACARS avionics is available in most of the aircraft operating in the CAR/SAM regions and that applications as PDC and D-ATIS developed for this type of data link and not foreseen by ICAO within its plans could be implemented. It was noted that the CNS Committee of the ATM/CNS Sub-Group was studying the advantage of carrying out these trials.

c) The FANS 1/A system is too expensive and very few aircraft count with the corresponding avionics and it does not seem convenient, in the light of the VDL mode 2 developments, to promote tests with these systems. One of the participants informed that the FANS 1/A station of Peru is not used or rarely used due to the lack of avionics equipment.

5.6.4 In this regard, the meeting considered the need to develop the matter more specifically and requested to submit it to the GREPECAS ATM/CNS Sub-group in order to provide more elements that enable the adequate programming of such activity, mainly regarding the necessary costs.

Item 6: Revision of the RLA/98/003 project document

6.1 Background

6.1.1 The original document on the Transition to the CNS/ATM systems in the CAR and SAM Regions Regional Project was conceived in 1996 entrusted by the Fifth Meeting of Civil Aviation Authorities of the CAR Region held in June of that year. Its scope for both regions was defined by the sixth meeting of the CAR/SAM Regional Planning and Implementation Group (GREPECAS) held during the second semester of the same year.

6.1.2 At the beginning the implementation of the project was proposed to the States under a trust funds agreement with ICAO. Furthermore, it was decided that it will be more convenient to implement it in association with the United National Development Programme, turning the initial proposal into an UNDP/ICAO project identified as RLA/98/003.

6.1.3 The approval procedure of the original project document and its conversion into RLA/98/003 took more than a year and the deposit of the first contributions from States and entities that have accepted to participate in its implementation was effective in the appropriate extent at the end of 1998, only then the project was ready to start its activities.

6.1.4 The full implementation of the project started effectively in May 1999, assuming more specific activities than those initially planned, in accordance with the guidelines derived from GREPECAS in respect of the development of an action plan to analyze the 18 main traffic flows identified in the CAR/SAM regional plan for the implementation of the CNS/ATM systems and advance the adoption of some elements of those systems.

6.1.5 The advances experienced in the time with the regional planning and the implementation of trials and demonstrations on some elements of the new CNS/ATM systems, as well as with the technology regarding information and communications systems, oblige to review the extent of the project and

adequate its contents to the results of the activities so far implemented and to the reality of the actual situation regarding its immediate objectives.

6.2 Need to extend the project's scope and the duration

6.2.1 Considering the above mentioned and as outcome of the positive achievements of the project during the first two years of activity, verified by the Coordination Committee as well as by GREPECAS and its contributing organisms, the meeting was informed of the need to extend its scope and duration in order to support the trials and demonstrations, in first instance, and the systematic implementation, in second instance, of new elements of the CNS/ATM systems that enable to obtain more immediate benefits as per less flight time, substantial savings in fuel consumption and the possibility of rationalizing the airspace use implementing required navigation performance, reduced vertical separation minima and the use, each time greater, of air navigation routes, among other facilities for the users.

6.2.2 The project has started to analyze human resources and their training, under which the need to increase the provision of training and familiarization programs with the new systems that involve each time more the personnel of the departments concerned of each administration is envisaged.

6.2.3 The study of the institutional issues and the cost-benefit relation derived from the implementation of the new systems is another matter that demands additional time of the project, in view of the new judging elements that the evolution process by its own is presenting.

6.2.4 It was also informed on the importance of keeping on with the study of the different implementation alternatives of the new systems for each State, derived from the results of the analysis of the 18 main air traffic flows recently finished by the project, which will enable the setting of the procedure for new installations as business cases to define the most convenient implementation, operation and maintenance modality.

6.2.5 On the other hand, as during the time elapsed since the planning of the project, the information services and communications have continued their development by themselves and civil aviation administrations, in general, have adopted them, immediate objective No. 4 related to the assistance provided to States in the strategic planning of civil aviation information systems has been overcome.

6.3 Project revision

6.3.1 Taking into account the above mentioned, the Committee considered necessary to review the project in order to adequate it to the reality of its implementation status and to extend the scope of its activities so as to include those that GREPECAS, in its tenth meeting held in October 2001, has decided to entrust the project, the preparation and execution of the actions addressed to assist States in the implementation of the reduced vertical separation minima (RVSM) and the required navigation performance (RNP) in the CAR/SAM regions, as well as the initiation of a RNP 10 trials and demonstrations program in the airspace from Santiago de Chile to Miami along route UT 780 y its parallel route.

6.3.2 The Committee considered the proposed changes to Parts D. and E. of RLA/98/003 project document and approved revision "F" of the project presented as **Appendix H**.

Item 7: Other matters

7.1 It was agreed that the fifth meeting of the coordination committee will be carried out at the ICAO NACC Regional Office in Mexico on the 27 and 28 November 2002.

7.2 Finally, the ICAO Regional Representative in Lima, Mr. José Miguel Ceppi, thanked all the participants for their assistance, closing the meeting.