INTERNATIONAL CIVIL AVIATION ORGANIZATION

THIRD RLA/00/009 PROJECT COORDINATION MEETING

(Rio de Janeiro, Brazil, 15 to 17 October 2003)

Agenda Item 2: Report on activities carried out to date

ANNUAL PROGRAMME REPORT

(Presented by the Secretariat)

Summary

This working paper presents the annual programme report of the activities carried out for the execution of the Regional GNSS augmentation trials since the second Coordination Meeting (August 2002-30 September 2003). In addition, the annual programme report presents forms showing the activities of the project, for the evaluation by participant States.

Reference:

- RLA/00/009 Project document.

1. Background

1.1 The annual programme report is an assessment of a particular programme or project during a given year by target groups**,** programme or project management, government and UNDP. It aims to:

(a) Provide a rating and textual assessment of the progress of a programme or project in achieving expected results;

(b) Present stakeholders' insights into issues affecting the implementation of a programme or project and their proposals for addressing those issues;

(c) Serve as an input to any evaluation of the programme or project;

(d) Be a source of inputs to the preparation of the annual and country reviews of the country cooperation framework.

2. Contents and structure

2.1 The annual programme report form is divided into three parts. Part I requests a numerical rating of programme or project relevance and performance, as well as an overall rating of the programme or project.

2.2 Part II asks for a textual assessment of the programme or project, focusing on major achievements, early evidence of success, issues and problems, recommendations and lessons learnt.

2.3 Part III consists of a summary table with two sections: one section reports on resources and expenditures, and the other highlights progress towards achieving expected results. Annexes may be included, as necessary, to provide specific information in support of the rating and assessment indicated.

2.4 The participant States in the project have to numerically qualify during the meeting Part I of the annual programme report, putting the name, date and signature. **Appendix A** to this paper presents the annual programme report of the RLA/00/009 project.

3. Actions suggested

3.1 The meeting is invite to:

a) take note of the annual programme report that is presented in Appendix A;

b) qualify the annual programme report using the form presented in Part I of the annual programme report; and

c) Analyse Parts II and III of the annual programme report.

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APPENDIX A

ANNUAL REPORT
UNDP/ICAO RLA/00/009 PROJECT
Regional GNSS augmentation trials

Basic Information on the Project (provided by the project management)

Number and title of the project:	RLA/00/009–Regional GNSS augmentation trials
Designated institution:	ICAO
Project initiation date:	
Originally planned:	July 2001
Effective:	July 2001
Project termination date:	
Originally planned:	June 2004
Effective:	
Total budget (Dollars):	
Initial amount:	229,900
Last approved revision:	188,936
Period covered by the report:	August 2002 – September 2003

PART I: NUMERIC EVALUATION

Please evaluate pertinence and performance of the programme or project, using the following scale:

1 – Highly satisfactory
2 – Satisfactory
3 – Not satisfactory, with some positive elements
4 – Not satisfactory
X – Does not apply

Please indicate your answers in the column corresponding to your function in the programme or project.

SUBSTANTIVE APPROACH	ICAO	ARG	BOL	BRA	CHI	COL	ECU	EE.UU.	PAN	PER	VEN	COCESNA	AVERAGE
1. How do you evaluate the level of pertinence of the programme or project in relation to the development priorities of the country?	X												
2. Given the programme or project objectives, is support provided to pertinent institutions?	2												
3. Using the following indicators, evaluate the product contribution to the achievement of the immediate objectives a/:													
Indicator #1 GREPECAS will count with the necessary information that will allow the establishment of an operational model of a system augmentation, type GNSS (SBAS / GBAS) in the CAR/SAM regions.	2												
Indicator # 2 Project participant States will have qualified personnel to analyze the installation of the augmentation systems in support to the navigation systems.	2												
4. Evaluate achievement of desired products.	2												
5. Are management mechanisms of the programme or project adequate?	2												

SUBSTANTIVE APPROACH	ICAO	ARG	BOL	BRA	CHI	COL	ECU	EE.UU.	PAN	PER	VEN	COCESNA	AVERAGE
6. Are programme or project resources sufficient (financial, physical and human) in respect to: a) quantity? b) quality?	 3 2												
7. Are programme or project resources being used efficiently to produce aimed results?	2												
8. Is the programme or project effective in function of costs, in comparison with similar programme or projects?	2												
9. Based in the work plan, how would you evaluate the opportunity of the programme or project regarding: a. achievement of initial products and results? b. delivery of supplies?	 2 3												
GLOBAL EVALUTION OF THE PROGRAMME OR PROJECT	2												

Explain the basis of your grading, which does not have to limit itself exclusively to the relevance and performance and cannot coincide with the above grading. With regard to the last year of the programme or project, a possible programme or project success estimate must be included in the global grading, as well as of its relevance and performance.

From the data collection from the reference stations and their subsequent analysis, importance conclusions were obtained, which will permit having the information necessary to start the study of an operational model for en route and NPOA operations in the CAR/SAM Regions through a GNSS SBASS augmentation system.

PART II: DESCRIPTIVE EVALUATION

1. Which are the principal achievements of the programme or project in relation to the expected results during the period being evaluated? If possible, please include an evaluation of possible effects, sustainability, and contribution to capacity development.

   - **Data collection and processing from the reference stations.**
   - **Implementation of data processing stations in Colombia and Peru.**
   - **Important conclusions as result of first trials, which permitted defining that through augmentation platform installed there would be a guarantee, in principle, of en route and NPA operations. Study of scintillation phenomenon in the ionosphere being carried out in Brazil would be defining additional considerations, if the case, that would be guaranteeing aforementioned operations. To verify operations with APV vertical guidance, a ionosphere model study is being carried out to be used in the master station to correct errors in GPS signals.**

2. Which are the questions and principal problems that influence the achievement of the programme or project results?

   - **Implementation of satellite ground station has not occurred due to its high cost.**
   - **Delay in REDDIG operation.**
   - **TRS unconnected to REDDIG node.**

3. How should these questions or problems be solved? Please provide a detailed explanation of the recommended action or actions. Specify who should be responsible for these actions. Indicate also a provisional timetable and necessary resources.

   - **SBAS augmentation will be carried out as long as satellite ground station is implemented. If ground station is not installed, augmentation trials could be made via VHF communications systems.**
   - **That States that have not physically connected the TRS to the REDDIG node do so soonest.**

4. What new happenings could probably affect the achievement of the programme or project results? What do you recommend to be prepared for these happenings?

   To be able to carry out vertical guidance approach (APV) it is necessary to complete the ionosphere mathematical model. Without this mathematical model to be installed in the master station, no trials can be carried out.

5. Which is the opinion of States regarding the programme or project?

   The project specified CAT 1 approach trials; these will not be able to be made due to limitations in the systems. The augmentation system would be guaranteeing vertical guidance approach operations once corrections (ionosphere model) are made at the master stations.

6. Up to date, what lessons (positive or negative) can be pointed out from the programme or project experience?

   - **States involved in the project have gained knowledge and experience as regards GNSS augmentation systems.**
   - **The GNSS augmentation platform currently installed would be guaranteeing en route operations and NPA approach. Vertical guidance operations require the ionosphere model currently under study.**

7. Do you propose any substantial revision to the project document? If yes, which are these revisions= Please indicate justifications.

   The project's first phase evaluation has been satisfactory. Conclusions formulated during the second coordination meeting have been executed.

8. Provide any other information that could support or give clarity to your programme or project evaluation. You may include the annexes that you consider necessary.

   Please see answers 4 and 5. In addition, if satellite ground station is not implemented, on flight trials would have to be made via VHF communications systems.

For Argentina: Name: Position: Signature:	Date:
For Bolivia: Name: Position: Signature:	Date:
For Brazil: Name: Position: Signature:	Date:
For Chile: Name: Position: Signature:	Date:
For Colombia: Name: Position: Signature::	Date:

For Ecuador:	
Name:	
Position:	
Signature:	Date:
For the United States:	
Name:	
Position:	
Signature:	Date:
For Panamá:	
Name:	
Position:	
Signature:	Date:
For Perú:	
Name:	
Position:	
Signature:	Date:
For Venezuela:	
Name:	
Position:	
Signature:	Date::
For COCESNA:	
Name:	
Position:	
Signature::	Date::
For ICAO:	
Name:	
Position:	
Signature:	Date::
For UNDP	
Name:	
Position:	
Signature:	Date:

PART III: Summary chart of the programme or project

Programme or project title and number:	GNSS Regional Augmentation Trial	Management dispositions:	
Designed institution:	ICAO	Covered period:	July 2001/June 2004
GLOBAL EVALUATION			
During the project's second year, its main activities have been the data collection from the TRS, and their processing. In addition, some States of the Region have implemented processing stations and are currently in the capacity of analyzing the data collected. Studies on the ionosphere continue, and it s expected that during the coordination meeting, news of the first results can be obtained.			

FINANCIAL SUMMARY			
Funds Source	Budget (Thousand Dollars)	Espenditures (Thousand Dollars)	Implementation Rate (%)
Participation in funding of expenditures: Governments of:			
Argentina, Bolivia, Colombia, Ecuador, Panama, Peru, Venezuela and COCESNA.	30,0 (2001)	30,0 (2001)	N/A
	48,4 (2002)	48,4 (2002)	N/A
	53,7 (2003)	2,0	3.7 %
	56.8 (2004)		N/A

SUMMARY OF RESULTS			
Programme support objectives or immediate objectives		**Indicators**	**Achievements**
Obj. 1	Develop a test and evaluation plan on the technical and operational benefits of the U.S. FAA WAAS in the Caribbean and South American regions (CAR/SAM), so as to assist in the establishment of the satellite based augmentation systems operational model being developed by the GREPECAS CNS/ATM implementation coordination subgroup.	**Indicator #1** GREPECAS will count with the necessary information that will allow the establishment of an operational model of a system augmentation, type GNSS (SBAS / GBAS) in the CAR/SAM regions. **Indicator #2** Project participant States will have qualified personnel to analyze the installation of the augmentation systems in support to the navigation systems.	To date, important conclusions have been obtained to help define an initial operational model for a GNSS augmentation system in the CAR/SAM Regions. Participant States have been trained through the realization of two of the three foreseen courses. They have acquired the knowledge for the TRS installation. They have achieved familiarization with the initial tests of data collection in ground and air. They have become familiar with the processing of the data collected.

Annual goals	Products achievement	Proposed products goals for next year
Objetive 1 Develop a test and evaluation plan on the technical and operational benefits of the U.S. FAA WAAS in the Caribbean and South American regions (CAR/SAM), so as to assist in the establishment of the satellite bed augmentation systems operational model being developed by the GREPECAS CNS/ATM implementation coordination subgroup.		
1.1. CAR/SAM test bed operational test and evaluation plan developed and approved.	The tests plans elaborated so far and approved by the participant States consisted on the collection of data in ground and air to analyze the influence of these with the ionosphere for en route and NPA operative procedures.	To finish the elaboration of the remaining plans.
1.2 GPS approach procedures for test flight to exercise the WAAS component in each participating State at one airport.	Not yet carried out.	Their realization is expected in March 2004.
1.3 Development and refinement of operational standards and procedures for use and approval of satellite-based navigation systems.	ICAO effective regulations will be used.	ICAO effective regulations will be used.
1.4 Preparation for test and evaluation data collection and analysis in each participating State (Equipment Installation Site Survey and Installation Plan.	Carried out. A plan for data collection at TRS stations has been prepared.	It is expected that by the end of November 2003 the communications platform is concluded through REDDIG.

Annual goals	Products achievement	Proposed products goals for next year
Objetive 1 Develop a test and evaluation plan on the technical and operational benefits of the U.S. FAA WAAS in the Caribbean and South American regions (CAR/SAM), so as to assist in the establishment of the satellite bed augmentation systems operational model being developed by the GREPECAS CNS/ATM implementation coordination subgroup.		
1.5 Regional Flight Test Plan (Phase 1) developed for testing and evaluation of cooperative concepts and architecture fo an integrated satellite navigation system.		Flight tests for the verification of the SBAS augmentation. For this purpose Brazilian and Colombian flight inspection aircraft will be used.
1.6 Completed Regional Flight Test Plan.		It is expected that the flight tests will conclude by end of May 2004.
1.7 Regional Flight Test Report (Phase 3) to include each sub-region test bed airborne segment analysis and reports for the regional tests.		It is expected that the report will be finished by June 2004.
1.8 State Flight Test Plan developed (Phase 4) for testing and verification of satellite navigation concepts in each participating State.		Flight tests for the verification of SBAS augmentation will depend of ground satellite station installation. Augmentation trials will be verified via VHF communications systems.

Annual goals	Products achievement	Proposed products goals for next year
Objetive 1 Develop a test and evaluation plan on the technical and operational benefits of the U.S. FAA WAAS in the Caribbean and South American regions (CAR/SAM), so as to assist in the establishment of the satellite bed augmentation systems operational model being developed by the GREPECAS CNS/ATM implementation coordination subgroup.		
1.9 Preparation for testing and evaluation of the performance of the test bed for all phases of flight down to and including CAT I precision approaches. State Flight Test Plan.	In accordance with the first results of the tests carried out to-date, the type of tests that the project will be able to embrace will be for en route and NPA operations. No CAT 1 tests will be carried out.	
1.10 Completed State Flight Test Plan.		Its completion is expected by May 2004.
1.11 State Flight Test Report (Phase 6) completed to include each sub-region test bed airborne segment analysis and reports at the State level.		Its completion is expected by June 2004.
1.12 State Operational Implementation Strategy/Plan (Phase 7). Reduction of the risks and removal of the barriers involved with a future implementation of satellite navigation in the CAR/SAM regions.		This plan will be included in the Project final report.

Annual goals	Products achievement	Proposed products goals for next year
Objetive 1 Develop a test and evaluation plan on the technical and operational benefits of the U.S. FAA WAAS in the Caribbean and South American regions (CAR/SAM), so as to assist in the establishment of the satellite bed augmentation systems operational model being developed by the GREPECAS CNS/ATM implementation coordination subgroup.		
1.13 State/Regional Training Plan Technical and operational experience and training provided to facilitate the implementation of a satellite navigation system.		The last course, entitled Operational Requirements, is foreseen for June 2004.
1.14 State/Regional Cost Benefits Analysis. Provision of data and information for the development of a verifiable cost/benefit analysis.		This analysis will begin in June 2004, and is expected to be finished in 15 days.
1.15 State/Regional Satellite Navigation Architecture. (Hardware, Software/ Communications) Provision of convincing technical proof of concept to initiate funding to start the implementation of satellite navigation in the CAR/SAM regions.		This will entirely depend on the results of the tests.
1.16 Operational training programmes available for all participants in the test program. (Training support as requested).		June 2004

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