International Civil Aviation Organization
Regional Group of Planning and Implementation CAR/SAM (GREPECAS)
First Meeting of the Subgroup of Communications, Navigation and Surveillance/ Air Traffic Management (CNS/ATM/SG/1)
(Lima, Peru, March 15th-19th 2010)

Agenda Item 2: Review of global and CAR/SAM CNS/ATM developments

BULLETIN NO. 1 OF THE RLA/03/902 – SACCSA PROJECT

(Informative paper presented by the Project Coordinator, TCB - ICAO)

SUMMARY	
This informative note introduces the Bulletin No. 1 of the RLA/03/902 Project, which contains information about Phase III and the activities performed in 2009 related to GNSS implementation.	
Reference: • Bulletin No. 1 of the RLA/03/902 Project, December 2009	
***ICAO strategic objectives*:**	*A - Safety* *D - Efficiency*

1. Introduction

1.1 In December 2009, the RLA/03/902 SACCSA Project issued Bulletin No. 1, in which detailed information was provided about Phase III and the involved parties in this phase management, the responsible team in charge of the ongoing tasks and distribution and assignment of these. This means of communication also informed about activities held for the Project in 2009 related to GNSS implementation. This bulletin can be found as **Appendix** of this information paper.

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APPENDIX

RLA/03/902 PROJECT

Transition to GNSS within CAR/SAM Regions– Augmentation Solution for the Caribbean, Central and South America (SACCSA)

BULLETIN Nº 1 – Dec 2009

INTRODUCTION

The RLA/03/902 project – SACCSA (*Augmentation solution for the Caribbean, Central and South America)*, represents an important milestone in the CAR/SAM Regions, since it allows a deeper analysis and search of alternatives to implement the Global Navigation Satellite System (GNNS) and the application of its modern technologies in the aeronautical and multimodal industry in conformity with SARPS and ICAO orientation materials.

Due to the special characteristics of this project, which combines technical, operational, financial, institutional studies along with application studies, it is indeed complex to manage and to keep appropriately informed all the countries and participating International Organizations. Therefore, it is considered suitable to issue a bulletin that will keep informed all participating parties about the progress of the project. This initiative, at the same time, will also open doors to valuable contributions made by participating countries and International Organizations. It will enrich all parties' experiences by exchanging ideas and tentative projects towards the GNNS implementation and its application, such as aerial navigation based on performance (PBN) or LVP procedures.

Additionally, this bulletin will spread the GNSS use to other parts of the society, which will greatly benefit from the use of this system.

The bulletin Nº 1 intends to inform about the FASE III, the parties involved in management, the responsible team in charge of development, distribution and assignment of tasks and all the activities taken place in 2009. In future issues, very likely bulletin Nº 2, a comprehensive compilation of past events along with latest developments will be included.

PROJECT MANAGEMENT

Due to the project complexity, its management has been divided in three parts:

1. **Administrative and Technical Management.** By ICAO's Technical Co-operation Bureau in Montreal, which is in charge of the following responsibilities amongst others:

   a) Elaborating agreements that support the project and obtaining the corresponding signatures from International Organizations and countries involved.
   b) Gathering contribution fees and managing the funds.
   c) Organizing tenders and undertaking responsibility of signature of contracts with the tender winner.
   d) Coordinating with ICAO's Regional Offices in South America (SAM), North America, Central America and the Caribbean (NACC).
   e) Coordinating with supporting countries and International Organizations to appropriately follow up, spread and analyze all accomplished work.
   f) Implementing, along with AENA, the introductory phase.

2. **International Consultant**. Cap. Jorge A. Córdoba S. (Costa Rica) is the appointed International Consultant. His responsibilities include:

   a) Fostering and promoting the SACCSA Project among the countries and International Organizations within the CAR/SAM Regions.
   b) Dealing and negotiating with participating countries and International Organizations in order to obtain more support and cooperation for the project.
   c) Fostering SACCSA advantages within non aeronautical sectors.
   d) Contacting institutions in the countries within the CAR/SAM Regions to involve non-aeronautical parties.
   e) Promoting the participation of different Ministries of the supporting countries (Industry, Transport, Finances, etc)

3. **Technical Coordination**. Luis Andrada Márquez (AENA, España) is the appointed Coordinator and his responsibilities include:

   a) Monitoring technical activities, in coordination with the International Coordinator, assuring the appropriate development of the project.
   b) Coordinating technical activities contracted by ICAO.
   c) Coordinating with SACCSA participating countries and International Organizations , so that SACCSA web access can be granted. Also, if required, access and/or contact with staff in charge of developing industrial activities of the Project could be arranged, including granting authorizations to visit or contact staff if necessary.
   d) Acting as a link between the contractor and ICAO, informing this institution if an irregular situation is detected.
   e) Supervising the implementation of services based on SACCSA.
   f) Reviewing and approving, if necessary, work performed by the contractor in different areas.
   g) Organizing presentations and showing results of accomplished and/or in progress work in as many forums as ICAO designates necessary (GREPECAS, CNS/ATM, RCCs, seminars, etc.)
   h) Organizing follow-up meetings with the contractor as often as

necessary in order to ensure the appropriate development of on-going projects.

Phase III RLA/03/902 – SACCSA Project

In order to approach Phase III of the project, a work group has been designated. It will be under supervision of ICAO along with AENA, which will coordinate implementation of technical activities. This will involve the industry (based on the tender winner of the contest launched by ICAO), operators, users, suppliers, and civil aviation administrations. Both institutions will perform necessary work based on the following criteria:

1. Network monitoring to analyze, with factual data, the behaviour of models defined for the region, particularly the ionosphere
2. Flexible and adaptable prototype of the SACCSA Process Unit (UPC) which will work with factual data and will contribute to the technical viability analysis.
3. Previous research regarding last phases must be completed, concluding subjects such as communications, ionosphere, topology, etc.
4. Definition of supporting activities towards validation/certification.
5. Analysis of additional options in limited or poor areas.
6. Institutional aspects that allow countries/International Organizations approach the government and contact the corresponding credit institutions.
7. Project Finance studies.
8. Cost/Benedit studies.
9. Workshops and seminars.

It must be added to this list the website launch for this Project, based on what it's indicated in this document.

This Phase will determine viability in the case that CAR/SAM regions are provided with a SBAS system which would cover its needs and its users' needs. This will be based on results and calculations obtained in Phase II. The above-mentioned system will be defined according to special characteristics derived from both regions, and its configuration will be adapted to aerial space distribution. Management/operational guidelines will also be established as well, and international parties to be created in order to carry out these tasks will be specified. However, given the high cost incurred when implementing a SBAS, a thorough analysis will be performed to determine financial resources needed and the way to obtain them through different sources and available credit options.

ACTIVITIES HELD IN 2009

GNSS Advanced Seminar / Workshop and Extraordinary Meeting of the Coordination Committee

A GNSS Advanced Seminar/ Workshop was held in San Jose, Costa Rica from April 20-24, 2009, based on the following objectives:

- Establish a common knowledge platform in order to thoroughly understand concepts and up-to-date information about technology, GNSS use and the augmentation system.
- Offer a general view of SARPS and ICAO orientation material about GNSS.
- Explain the elements of the satellite-based augmentation system based (SBAS), system architecture, and the supporting segment for the certification and operation processing.
- Display the GNSS applications for civil aviation and other fields.
- Offer an up-to-date review of GNSS technology, development, performance, applications and characteristics.
- Explain GNSS analysis tools.
- Introduce an outlook on the RLA/03/902 Project and its Phase III.

Participants of the GNSS Advanced Workshop, RLA/03/902 Project, held on CeNat, San José, Costa Rica, from April 20th – 24th, 2009

As a result of discussion and ideas introduced by participants about the Seminar/Workshop subjects, the audience reviewed and adopted the following results. These are considered to contribute efficiently to fulfill the activities for the RLA/03/903 Project-GNSS Transition within the CAR/SAM Regions, Implementing the alternative for the Caribbean, Central America and South America (SACCSA). Therefore, these are the requirements to implement the Global navigation satellite system in the above-mentioned regions:

a) A continued interest in monitoring experience and knowledge regarding GNSS elements development, and worldwide evolution, in order to use this information to optimize GNSS application and obtain the most benefits for the CAR/SAM Regions.
b) The process of implementing GNSS must be in conformity with SARPS, and ICAO orientation materials and strategy.
c) Taking into account the variety and extent of GNSS applications, co-

operation is encouraged between national organizations dedicated to perform research and make progress on development with support of educational institutions (universities and others); so that scientific and technical support is provided. It will also contribute to spread this knowledge and SACCSA could use/pass it to future users, and apply it on multiple areas in the participating countries.

d) National, regional and worldwide co-operation is key to exchanging knowledge and experience. It also optimizes resources and attains goals related to efficiently implementing GNSS

e) A need to evaluate and update studies regarding the possibility of placing navigation volume on satellites used for communications in the participating countries within the CAR/SAM Regions. Additionally, it was pointed out that it would be necessary to obtain a convergence of project launching for these satellites, with possibility of implementing SBAS navigation volume along with details on cost analysis and others. To this respect, it was informed that Venezuela has a satellite, and also Argentina and Colombia have tentative plans to implement satellites in five years. In addition, it is estimated that other countries within the same region may have similar plans. This should be taken into account in Phase III of the RLA/03/902 Project, along with the study of a viable platform with spatial navigation volume, as it is suggested in one of the work tasks of this project.

f) Participants took note that according to worldwide experience related to implementing SBAS systems, it was pointed out the benefit of having three Processing and Control Centres located in three different places within the CAR/SAM Regions.

g) In Phase III of the SACCSA Project, it is recommended to perform a new analysis on the existing communications infrastructure within these regions in order to determine if it could be used in SACCSA. It will be accomplished by supplying up-to-date information based on co-operation of the participating countries and International organizations.

h) It was highlighted the convenience of providing access to complementary direct communications services (which will add up to the current ones), between the remote stations and the Processing and Control Centres, and among them for coordination and maintenance.

i) Results obtained during Phase II of the RLA/03/902 Project are recognized as a positive indicator of the system technical viability. It's acknowledged the importance of concluding technical-financial viability studies when implementing SBAS within CAR/SAM regions in order to provide participating countries, international organizations and users -through GREPECAS-, documented and necessary evidence to take the correct decision. State Administrations are encouraged, if they haven't done it yet, to join and participate on Phase III of the RLA/03/902 – SACCSA Project in order to increase international collaboration and obtain a fulfilling final result. In addition, those administrations and users could see progress and obtain benefits when implementing GNSS and its augmentation systems.

j) It's acknowledged that RLA/03/902 Project will bring necessary evidence to optimize possibilities of achieving ICAO goal which is to implement a solid navigation infrastructure in conformity with performance. It must provide a

worldwide, precise and reliable navigation/positioning capacity, with no limits and will contribute to add up benefits regarding operational security, efficiency and continuity of operations.

k) In addition, it is acknowledged that the Project does encourage participating countries, international organizations and users towards the publication and exchange of results and experiences, training, and sharing of resources, infrastructure and available knowledge, so that actors can contribute in the decision making process and obtain benefits.

l) Offers have been recorded to contribute to the development of studies by CeNAT (National Centre for High Technology) and the Engineering Faculty of the Universidad Distrital Francisco José de Caldas-Bogotá, which will be taken into account and are deeply appreciated.

m) It was determined the importance of the RLA/03/902 project, which is based on results obtained through studies and evidence. It must continue to assist GREPECAS in order to obtain correct conclusions about implementing the operational/regional GNSS model.

n) Goals linked to implementing GNSS can be achieved through integration, coordination and co-operation of all participating countries and international organizations within these regions along with sectors that require more advanced GNSS services.

Numerous participants thanked the invitation to participate in this event and supported the culmination of Phase III of the RLA/03/902 Project. They acknowledged that it brings multiple benefits to participating countries and international organizations not only in the aeronautical field. In addition, some of them informed that their corresponding administrations are analyzing the possibility of participating in this project.

On April 24, 2009, the last day of the seminar/workshop, in San Jose, the RCC Extraordinary Meeting was held in order to present the new distribution of work to be done for Phase III. The objective was to adapt it to an International tender contest, organized by TCB-ICAO, so that a contractor can be selected to perform technical work in SACCSA Phase III. In addition, ICAO informed about the financial status of the project and the contributions gathered (the RCC's final report includes more detailed information.)

In August 2009, ICAO's TCB sent to GNSS specialized companies an invitation to tender in order to opt for the work to be done in the SACCSA Project - Phase III. The following tasks were to be assigned:

- PT 1000: Network monitoring and control.
- PT 2000: Conclude studies of Phase III, closing subjects such as ionosphere, communications, network topology of reference stations and others.
- PT 3000: SACCSA UCP prototype and its operation.
- PT 4000: Definition of supporting activities for validation/certification processes in the system.
- PT 5000: Analysis of additional options in poor or limited areas.
- PT 6000: SACCSA Website.

Thirteen companies were invited, and the selected consortium is the following:

- GMV (acting as main contractor (Spain)
- INDRA (Spain)
- Raytheon (USA)
- SENASA (Spain)
- Universidad Nacional de la Plata (Argentina)
- CeNAT (Centro Nacional de Alta Tecnología de Costa Rica)*

On the proposal, the ICAO's TCB evaluating committee indicated the following (excerpted from the final evaluation report):

"The consortium accredits considerable experience in GNSS, with substantial participation in WAAS, GAGAN, MTSAT, EGNOS and GALILEO Projects, with WAAS fully operational for LPV 200. The continuation of the works done in SACCSA Phase II is guaranteed, using compatible/advanced or same tools and methodology, and defining it with an interoperability perspective, especially with WAAS, to fulfill an American continent SBAS solution (WAAS + SACCSA). Another important aspect is that the consortium includes 3 Spanish, one North American (USA), one Central American (Costa Rica) and one South American (Argentina) companies that will have a complete view of the system, and will ensure the opportunity to continue in further phases of SACCSA.

The offer is fully compliant with the request in the tender document issued by ICAO, addressing different points and requirements. It responds to all the questions, and in some cases, offers work in addition to the ones required. The price is adjusted to the requirements, and in some cases, show a clear technical interest in the project, beyond commercial issues or interest, being in line with the global market prices for these types of studies".

Contracting process

With the objective of adapting availability of funds and keeping a more thorough control by ICAO'S TCB, it has been decided, as a mutual agreement with the winning consortium, to divide the contracting process in three parts, according to the following chart:

*National Centre for High Technology

FIRST GROUP OF WORK TASKS (WT) IN THE CONTRACTING PROCESS	
WT	**Denomination**
1100	Definition of network monitoring
2100	Technical analysis of the SBAS alternative
2200	Ionospheric analysis
2400	Communication network optimization
2600	Network topology
2800	Consultancy service about SBAS alternative
3100	Development and elaboration of the UCP prototype
6100	Definition of the website requirements

SECOND GROUP OF WORK TASKS (WT) IN THE CONTRACTING PROCESS	
WT	**Denomination**
1200	Implementing network monitoring
6200	Implementing the website

THIRD GROUP OF WORK TASKS (WT) IN THE CONTRACTING PROCESS	
WT	**Denomination**
1300	Operating the network monitoring
2300	Verification of the system specificities
2500	UCP Behaviour with factual data
2700	Interactive map update
3200	Operating the UCP prototype
4000	Defining supporting activities for validation/certification in the system
5100	Identifying poor or limited areas and additional options
5200	Supply of POLARIS LITE simulation tools
5300	Comparing additional options in poor or limited areas
6300	Operating and maintaining the website

The first group's work tasks have been already hired. The second group's will be hired in 2010, and the third group's will be hired at the end of 2010 or in the beginning of 2011.

Supporting countries/organizations

Currently, the countries/organizations members of the Project are:

- AENA (Spain)
- Argentina
- Bolivia
- COCESNA
- Colombia
- Costa Rica
- Guatemala
- Panama
- Venezuela

In addition, the following countries have showed interest for the Project and are in the stage of taking information and making a decision:

- Dominican Republic
- Ecuador
- Uruguay
- Peru
- Barbados

OTHER ACTIVITIES HELD IN THE CAR/SAM REGIONS

During the 22nd Meeting of Executive Directors of Civil Aviation of the East Caribbean, held from December 8th-11th, 2009, the following conclusion was reached (sic):

"5.5.6 The Meeting, noting the current status as well as the planned activities for Phase III of the SACCSA Project, agreed to the following conclusion.
Conclusion 22/9 *ICAO REGIONAL TECHNICAL COOPERATION PROJECT RLA/03/902 – GNSS AUGMENTATION SOLUTION FOR THE CARIBBEAN, CENTRAL AND SOUTH AMERICA (SACCSA).*

Recognizing that the augmentation solution for GNSS is of paramount importance to the E/CAR Region, States/Territories are therefore strongly urged to take every action possible to participate in the Regional RLA/03/902 Project –SACCSA."

This conclusion assumes a significant support to the Project, since the countries of this region represent an important part of the Caribbean aerial space, which services some of the main flight routes between South America and North America; and between this subregion in the Caribbean and North America. In addition, it represents the possibility of having a SBAS that would cover all America, through interoperations between WAAS and SACCSA.■

BACK COVER

With the goal of keeping informed countries and international organizations, this bulletin will be issued regularly, informing about the most important Project highlights and bringing related additional information in order to develop and implement the GNSS system within the CAR/SAM regions. Should you have any doubt or comment, or suggestions to include specific articles, please contact the Editorial Committee:

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