

INTERNATIONAL CIVIL AVIATION ORGANIZATION

**EIGHTH MEETING OF CIVIL AVIATION AUTHORITIES OF THE SAM REGION
(RAAC/8)**

(Buenos Aires, Argentina, 23 – 25 April 2003)

Agenda Item 4: Regional Air Navigation Plan – Transition to the CNS/ATM Systems

**REGIONAL TECHNICAL COOPERATION PROJECT RLA/009-Regional GNSS Augmentation
Trial**

(prepared by the Secretariat)

Summary

This paper lists the main activities carried out by the Regional GNSS Augmentation Trial project, as well as the future activities to be carried out until the completion of the project.

References:

- RLA/00/009 project document;
- Report of the RAAC/7 meeting; and
- Report of the Second Coordination Meeting of Project RLA/00/009.

1. Definition of the Regional GNSS Augmentation Trial

1.1 The GPS system, by itself, does not guarantee the precision, integrity, availability and continuity parameters during all flight stages; for that purpose, it requires an augmentation system.

1.2 Augmentation systems are the ones that give GPS information the precision, integrity, availability and continuity values specified in Annex 10, Volume I (Amendment 76), Table 3.7.3.4.1, depending on air navigation operations.

1.3 UNDP/ICAO Project RLA/00/009 is a regional trial for the augmentation of satellite-based GPS signals (SBAS), and is implemented thanks to an offer made by the FAA to conduct SBAS trials in the CAR/SAM Regions (Conclusion 8/36 of GREPECAS/8).

1.4 The physical platform that will support the trial consists of reference stations (TRS), master stations (TMS) and a satellite link to a geostationary communication satellite. This platform is fully installed, pending only the implementation of some communication circuits.

1.5 The main objective of the project is to develop a plan for testing and assessing the technical and operational benefits of wide area augmentation systems in the CAR/SAM Regions, in order to assist in the establishment of the operational model for the satellite-based augmentation system to be developed by GREPECAS.

2. **Activities of project RLA/00/009 carried out to date**

2.1 The trial project lasts 3 years. It is currently in its second year of implementation and is scheduled to be completed by mid 2004.

2.2 The RAAC/7 meeting was presented with information on the GNSS augmentation trial platform, the status of implementation of the project objectives, flight tests, and GPS data collection, as well as on the main conclusions reached to that date.

1.6 Based on the results of the trials, the RAAC/7 noted that, in much of the SAM region--basically the States within a +/- 20-degree band around the Equator--, GPS signals were strongly affected by the ionosphere, preventing the use of this system for non-precision approach operations that have altitude precision requirements.

1.7 In view of the above, the RAAC/7 meeting formulated Conclusion 7/9, suggesting that the project objectives be reformulated. The second coordination meeting on GNSS augmentation trials of project RLA/00/009 (Rio de Janeiro, 28-30 August 2002) agreed on the need to conduct studies for the development of a valid ionospheric model for the Caribbean and South American Regions, with a view to implementing vertical guidance procedures.

1.8 The ionospheric model will be developed by Brazil and is foreseen to be completed by mid 2004. The ionospheric model that is currently installed at the Rio de Janeiro and Santiago reference stations would only serve for en-route operations and approaches that do not require vertical precision. However, in order to guarantee the foregoing, data collection should continue with a view to a more in-depth analysis, specifically during the months and time of greatest solar activity in the ionosphere.

1.9 Therefore, one of the important activities being carried out at present is the collection of data. The data from the TRS stations in Argentina, Chile and Peru are being recorded at the FAA technological centre in Atlantic City. This information is available in the web page www.nstb.tc.faa.gov. The information from the reference stations in Brazil is collected at the data bank in Rio de Janeiro. On a weekly basis, Colombia stores the information collected in the following web page: www.aerocivil.gov.co/CNSATM/NAV/index.htm. Bolivia and COCESNA store the information in CD ROM and send it to the ICAO Regional Office in Lima on a monthly basis.

1.10 The information collected has not been processed jointly. It is expected that this task will be carried out by the FAA technological centre in Atlantic City and that the results will be ready before the next coordination meeting of project RLA/00/009, foreseen for mid 2003.

1.11 With the implementation and operation of the REDDIG, there are plans to interconnect the master stations, and to connect the reference stations to the master stations, thus completing the communication platform which is currently incomplete. This is expected to be in operation by the end of April 2003.

1.12 The installation and operation of the ground satellite station that will send the augmentation information to the INMARSAT geostationary communication satellite are foreseen for mid 2003.

1.13 This means that the whole GNSS augmentation platform will be installed by the second half of 2003, in order to begin trials of en-route navigation and non-precision approach operations that do not require vertical precision. **Appendix A** to this paper shows the activities to be carried out until the completion of the project.

APPENDIX/APENDICE

RLA/00/009 - ACTIVITIES TO BE CARRIED OUT FOR EXECUTION OF SBAS AUGMENTATION TRIALS / ACTIVIDADES A LLEVARSE A CABO PARA EJECUCION DE ENSAYOS AUMENTACION SBAS

