INTERNATIONAL CIVIL AVIATION ORGANIZATION

Seventh Meeting of Civil Aviation Authorities of the SAM Region (RAAC/7)

(Salvador, Bahia, Brazil, 1–3 July 2002)

Agenda Item 4 Transition to the CNS/ATM systems

d) GNSS augmentation trials in the CAR/SAM Regions (CSTB)

(presented by Chile)

Summary

This working paper presents to the civil aviation authorities of the South American Region a summary of the activities carried out during the first stage of the Wide Area Augmentation System (WAAS) trials and demonstrations in the SAM Region.

References

Project RLA 00/009 /A/01/15 Regional Global Navigation Satellite System (GNSS) Augmentation Trial
Working paper 03/GNSS/TF/4/24/05/00

1.- Introduction

1.1 Positioning using the Global Positioning System (GPS) is changing the way in which flight crews navigate today and will navigate in the future. Augmentations to the GPS basic system (Satellite-based augmentation system – SBAS- and the Ground-based augmentation system – GBAS) will continue increasing the technological capabilities of this century during all flight phases, from take-off, through en-route navigation, to Category III precision approaches. The implementation of a regional satellite navigation trial platform in the CAR/SAM Regions will permit the establishment of an operational satellite-based navigation system that will provide these benefits, representing an important evolution in navigation services for all users in the CAR/SAM Regions.

1.2 All of the CAR/SAM States have expressed their individual (and regional) commitment to the implementation of satellite-based navigation technologies. The main challenge now is to translate the individual implementation efforts that are currently being planned and implemented in the CAR/SAM Regions into a single, cohesive effort that will provide regional satellite navigation capabilities during all flight phases. As a result of these efforts, and with the purpose of joining forces

on the matter, Project RLA 00/009 /A/01/15 Regional Global Navigation Satellite System (GNSS) Augmentation Trial was established through ICAO.

1.3 In order to facilitate and expedite this transition to satellite navigation in the CAR/SAM Regions, Project RLA 00/009 will provide adequate assistance for the collection of information that will allow the Navigation Systems Development Task Force define a common path and a general plan for the implementation of GNSS augmentation technologies.

1.4 The first phase of the project involved trials and demonstrations in the southern part of the SAM Region, installing wide area augmentation reference stations in Argentina, Bolivia and Brazil, and using the existing ones in Chile and Peru. Subsequently, the aforementioned tests will be extended to include the northern part of the SAM Region and the Caribbean.

2.- Analysis

2.1 The first step towards the establishment of the trial platform has already been taken. In keeping with the timetable of activities defined at the Coordination Meeting for GNSS Augmentation Trials of Project RLA 00/009, held in Santiago, Chile, on 1-3 August 2001 (Appendix A), the Wide Area Augmentation System reference stations of Buenos Aires, La Paz and Lima have been installed and are fully operational. The reference stations of Buenos Aires and Lima are connected to the master station located in Santiago, Chile.

2.2 One of the objectives of the Coordination Meeting was to collect data during both the en-route and approach phases. In the en-route phase, data collection took place during the transfer of the Citation II of the DGCA from Santiago to Buenos Aires, Buenos Aires-La Paz, La Paz-Lima, Lima-Antofagasta, Antofagasta-Santiago.

2.3 While preparing the approach phase trials in Buenos Aires, it was noted that the correction data generated by the reference station were not reaching the master station due to problems in the communication link between Buenos Aires and Santiago.

The nature of the failure is unknown because of the impossibility of establishing an effective communication channel with the counterpart. The aircraft did the approaches without the correction signal issued by the master station in Santiago.

2.4 Since communications were not operational on the date foreseen for the trial, the reference station in La Paz, Bolivia, did not connect to the master station in Santiago. Anyway, data were collected in the Millenium receiver during the approach phase, without the correction signal, and during the en-route phase.

2.5 The reference station in Lima is connected to the master station since February this year. The data generated by the reference station in Lima is being sent to the

Tech Centre of the Federal Aviation Administration (FAA) of the United States, through the communication link established between Santiago, Chile, and Atlantic City.

2.6 The data collected by the flight inspection aircraft of the DGCA of Chile were sent to the FAA Tech Centre for analysis. The preliminary results of the analyses are expected to be available on the second half of August 2002.

3.- Conclusions

3.1 The assessment of the wide area augmentation system trials and demonstrations showed the need to increase the training level of the personnel assigned by the Administrations, in order to achieve the proposed objectives.

3.2 Civil Aviation Authorities of the CAR/SAM Regions should give their utmost support to both Project RLA 00/009 and to the activities planned in the respective States where the aforementioned trials will take place.

3.3 The trials revealed that, in some cases, the level of commitment of Civil Aviation Authorities, as expressed in Project RLA 00/009, was not met.

3.4 It should be noted that the Caribbean and South American (CAR/SAM) Regions are the first regions in the world to develop a Trial and Demonstration Programme that involves 2 (two) ICAO Regions.

3.5 Through the trials and demonstrations, the CAR/SAM Regions will have information available for the Navigation System Development Task Force to define the architecture that the satellite-based augmentation system (SBAS) will have in the CAR/SAM Regions.

3.6 The contribution in kind that the General Bureau of Civil Aviation of Chile has made to Project RLA 00/009 amounts to US$ 33,000.

4.- Suggested action

4.1 The meeting is invited to take note of the information provided in this working paper and, if the meeting so decides, to urge the States to continue supporting Project RLA 00/009 and the actions that the Project Coordination Group is carrying out in relation to the wide-area augmentation system tests.

4.2 In line with the above, the Civil Aviation Authorities are urged to develop a National Wide-Area Augmentation System Trial and Demonstration Plan that is compatible with Project RLA 00/009, in order to determine the impact of the aforementioned trials in each of the respective States.

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