

INTERNATIONAL CIVIL AVIATION ORGANIZATION
THIRD RLA/00/009 PROJECT COORDINATION MEETING

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

Agenda Item 3: Review of activities scheduled in the project document and their reformulation

REVIEW OF SCHEDULED ACTIVITIES

(Presented by the Secretariat)

Summary

This working paper presents information related with activities to be carried out by the project as of this date until its ending, forecast for mid-2004.

Reference:

RLA/00/009 project document, report of the Second Coordination Meeting.

1. **Background**

1.1 Since the first trials carried out to date for the execution of RLA/00/009 project, it has been verified that the current structure of SBAS GNSS augmentation would not be guaranteeing the air navigation operations that require certain vertical precision and, therefore, they would be oriented towards en route and non precision approach (NPA) air navigation trials.

1.2 To be able to support vertical guidance air operations, a CAR/SAM ionosphere model is being currently elaborated, with the aim of carrying out the necessary corresponding variations for corrections in the data processing of the master stations.

1.3 In addition, it could be verified that for NPA SBAS augmentation operations, flight and ground data collection should be continued, in order to analyse the scintillation effects in GPS signals and in the geostationary satellites in charge of disseminating augmentation to the GPS signals.

1.4 The main activity carried out to date has been data collection at every CSTB (CAR/SAM Test Bed) reference station, for its due processing. The data obtained with the trial platform will be used to elaborate a ionosphere model in the Equator's geomagnetic area, as well as establish the impact on service availability and continuity during the occurrence of ionosphere disturbances.

1.5 Continuation of the trials would consist in finishing the CSTB augmentation platform, carrying out flight trials to verify SBAS augmentation, finishing the scheduled training, and establishing a plan permitting a CAR/SAM GNSS augmentation system operational model.

2. **Scheduled activities**

2.1 Due to the delay in the South American Digital Network (REDDIG) implementation, the CSTB platform has not been able to operate through REDDIG. Some states have made the physical connection between the REDDIG node and the CSTB node, such as Brazil, which established a communications link between the Rio de Janeiro CSTB master station with the Curitiba REDDIG node. In Argentina, Bolivia and Peru, the reference stations are located very near to the REDDIG node, and have everything scheduled for their connection to the respective nodes.

2.2 The aeronautical administration of Chile is currently working in the implementation of a communications link between the Santiago/Arturo Merino Benitez International Airport, where the CSTB master station is located, with the REDDIG node in Cerro Colorado. In addition, Colombia has installed a satellite network VSAT station in Tegucigalpa, Honduras, which will permit taking the information from the Honduras reference station towards the Rio de Janeiro master station, via Bogota.

2.3 The Colombian aeronautical administration is working in a communications link between the CSTB node in the Aeronautical Training Centre (CEA) in Bogota and the REDDIG node, located in the facilities of the Control centre building, also in Bogota. In addition, it will have to multiplex its information with that of Honduras, to be able to take the information from the Colombia and Honduras nodes to Rio de Janeiro.

2.4 In accordance with the schedule of activities, the first item is to complete the CSTB platform that will support augmentation trials.

2.5 REDDIG went into operation on 30 September 2003. Currently, the only services in operation through this network are the ATS speech network and the AFTN. It has been forecast that by end of November 2003, the GNSS augmentation service passes through REDDIG.

2.6 Argentina and Peru are uninstalling the communications circuits towards Santiago de Chile and would be recording the data obtained from the TRS in CDs; this situation will remain like this until its connection and operation through REDDIG.

2.7 Data collection from the TRS will continue to be carried out and, once the GNSS service operates through REDDIG, the possibility will exist of collecting all the data simultaneously at the Rio de Janeiro and Santiago master stations.

2.8 The TRS data collected in Santiago will be transmitted to the FAA Atlantic City technological Centre for processing. Also, upon establishing the circuit between Rio de Janeiro and Atlantic City, data information collected from Rio de Janeiro will be sent to Atlantic City.

2.9 In addition, the analysis of the data collected from the TRS can currently be made in Colombia and Brazil, since they have processing units in operation.

2.10 Due to the delays in implementing the satellite ground station in Rio de Janeiro, due to its high cost, the flight trials for SBAS augmentation verification scheduled until the end of the project, will possibly be unable to be carried out.

2.11 Therefore, the remaining flight trials could be carried out disseminating augmentation through the VHF communications system. For this trial, Brazilian and Colombian aircraft would be used, as specified in the RLA/00/009 project document. This flight trials will permit verifying precision, integrity, continuity, availability and coverage parameters of the CSTB platform for en route and NPA air operations.

2.12 To complete personnel training as indicated in the project, a course on Operational Requirements has been scheduled for June 2004.

2.13 It is expected that, once all forecast trials have been carried out, there will be information necessary to evaluate the technical and operational benefits of satellite based augmentation systems in the CAR/SAM Regions, with the aim that the project can provide assistance in the establishment of a satellite based augmentation system operational model, to be developed by GREPECAS.

3. **Actions suggested**

3.1 The meeting is invited to:

- a) Take note of the information provided;
- b) Analyze Section 2; and
- c) Analyze the schedule of activities presented in **Appendix A** to this working paper.



RLA/00/009 - GNSS Augmentation Regional Trials
 ACTIVITIES TO BE CARRIED OUT FOR EXECUTION OF SBAS AUGMENTATION TRIALS

