INTERNACIONAL CIVIL AVIATION ORGANIZACION

ATN/GNSS CAR/SAM SEMINAR

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STATUS OF THE BRAZILIAN TRIALS OF THE SBAS AND GBAS AUGMENTATION SYSTEMS

(Prepared by Brazil)

SUMMARY

This Working Paper presents the Brazilian actions related to the Brazilian Test Bed (BTB) as part of the Caribbean and South America Test Bed (CSTB) regarding the Satellite Navigation demonstration in South America presented by some European institutional and industrial partners, headed by AENA.

1. INTRODUCTION

Installed since September 30, 2001, Brazilian Test Bed (BTB) presently operates with one Master Station in Rio de Janeiro and five Reference Stations located in Manaus(AM), Recife(PE), Brasilia(DF), Rio de Janeiro(RJ) and Curitiba(PR).

To carry out data collecting and instrument approach procedures evaluation, BTB also utilizes one Hawker 800XP aircraft, full equipped.

Being a CSTB component part, Rio de Janeiro Master Station will be connected to Santiago Master Station, besides being linked to at least two Reference Stations located in Honduras and Colombia.

In order to make viable an evaluation most close possible to an operational system, Brazil has begun the process of acquiring an geo up link station, to be installed in Rio de Janeiro until the beginning of 2003, furthermore it has been settled an Agreement to an initially use of an INMARSAT satellite (3F5). Taking in consideration that the Brazilian concept establishes an integrated architecture of SBAS/GBAS systems, BTB comprises interoperability testes and evaluations of those systems.

In order to do so, a preliminary phase of data collecting has already been started, with a SCAT1 station and an evaluation plan together with FAA is being expected to be in force this year, using a LAAS prototype station, in sate-of-art, to be implemented at Galeão International Airport.

2. BTB PRELIMINARY RESULTS

The preliminary results of BTB operation, from October 1st on, have exposed significant ionospheric features along of the geomagnetic equator; these include geomagnetic anomalies, plasma bubbles, and scintillation (Annex A), with damage to the use of ionosphere models conceived from the environmental characteristics of North Hemisphere.

Those preliminary results have caused the need to data collecting during flight which was performed by a FAA B-727 aircraft, entirely equipped (January 2002), as well as to celebrate an Ionosphere Seminar (March 2002) in order to involve the scientific community (Brazilian and international) about that event, besides establishing a working group to study and suggest a technical and operational solution to the problem. Annex A and Annex B show the report of the first meeting of the aforementioned group as well as the agenda of the next meeting.

3. OFFER OF SATELLITE NAVIGATION SYSTEM DEMONSTRATION PROPOSED BY AENA

In the same pattern of the proposed strategy made in July 1999(Varadero, Cuba, CNS/ATM/IC/5), DECEA has become aware of a new proposed offer of satellite navigation system in South America, presented by AENA.

It is important to notice that in the past, in 1999, an exchange of electronic mail has been carried out between DECEA and AENA, represented by Mr. Luis Andrada, showing Brazil's interest in testing other systems, aimed at assuring interoperability among them.

No other consistent strategy has been received since them.

The new offer, besides been similar to the one presented in 1999, do not take in account the ionospheric problems that have already been reported and do not add substantial value to the current program plan either.

AENA documentation, besides being generical, it is quite inaccurate.

In Brazil instance, DECEA authorities do not guide themselves by "lobby" pressure; they also has been made huge investments in a partnership way with FAA in order to improve the knowledge of satellite navigation in the CAR/SAM region, as could be seen by the GNSS Seminar, Multi Modal Demonstration and the Satellite Seminar, all open to the CAR/SAM aeronautical community under coordination of Lima ICAO Regional Office.

All the transition process to CNS/ATM systems has been based on the Brazilian Aeronautical Commander's guidance named "Politics and Strategy", in force since 1994 and presented to whole international aeronautical community, according WP 82, of the World Wide CNS/ATM Systems Implementation Conference, Rio de Janeiro, 11-15 May, 1998.

All the efforts that have been made together with FAA are part of two Agreements (Memorandum of Agreement/ Memorandum of Cooperation), signed in 2000, both of them established based on the guidelines of the national "Politics and Strategy" document.

The partnership with FAA has been observing a working program plan of common interest, with complete transparency in all the actions, with technology supply and the highest spirit of cooperation, always focusing on the improvement of the satellite navigation in CAR/SAM region.

4 RECOMMENDATION

The group is invited to:

- 3.1 Note the information in this Working Paper, in order to incorporate them into the CAR/SAM region Satellite Navigation Trials Plan.
- 3.2 Note the appendix with the agenda for the Brazilian Ionosphere Working Group, to be held from 20th to 21st of May, 2002, Rio de Janeiro, and invite all the participants to join in this group.
- 3.3 Note the information presented in order to support further decisions on new satellite navigation trials in CAR/SAM region.