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

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

BRAZILIAN GBAS PROGRAM UPDATE

(Presented by Brazil)

SUMMARY

This paper presents an update of the Brazilian GBAS Implementation Project status, regarding the current structure for the tests carried out by DECEA and FAA at Rio de Janeiro Int'l Airport, the ongoing data analysis activities and the planned future work within the GBAS Project.

ICAO Strategic Objectives:	*A - Safety* *D - Efficiency*

1. INTRODUCTION

1.1 Brazilian Administration has installed a LAAS Test Prototype (LTP) at Rio de Janeiro International Airport in 2003, in a cooperation project with FAA, to support a future GBAS implementation in the country.

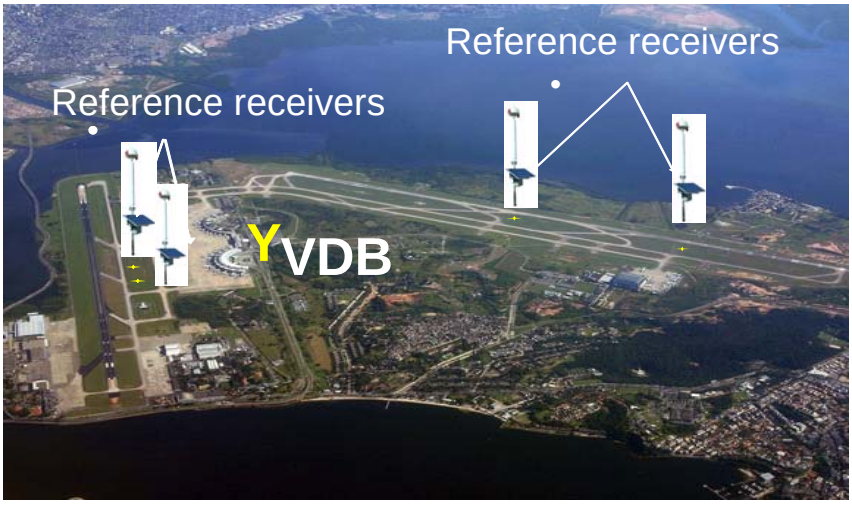
1.2 Since then, data collection has been continuously carried out to provide information about the influence of ionosphere activity on GBAS operation.

1.3 This paper presents an update of the Brazilian GBAS Implementation Project status, regarding the current structure for the tests carried out by DECEA and FAA at Rio de Janeiro Int'l Airport, the ongoing iono data analysis activities and the planned future work within the GBAS Project.

2. DISCUSSION

2.1 Current Structure

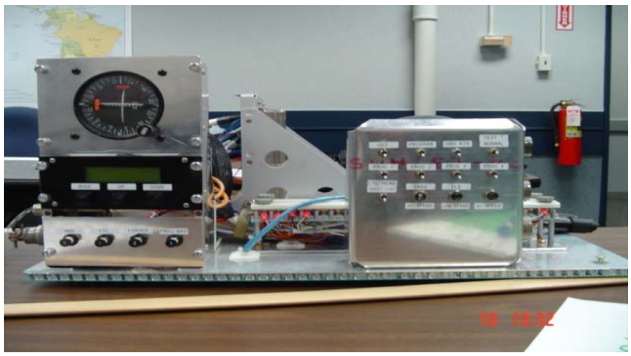
2.1.1 The LAAS Test Prototype (LTP) placed at Rio de Janeiro International Airport is composed of 04 reference receivers, a central processor and a VHF Data Broadcast (VDB), used for GPS position augmentation and Terminal Approach Procedures (TAP) uplink.



LTP Layout – Rio de Janeiro International Airport

2.1.2 Currently, there are 04 (four) GPS L1/L2 ASHTECH receivers installed around the LTP within a radius of 30NM collecting GPS data at a rate of 1Hz.

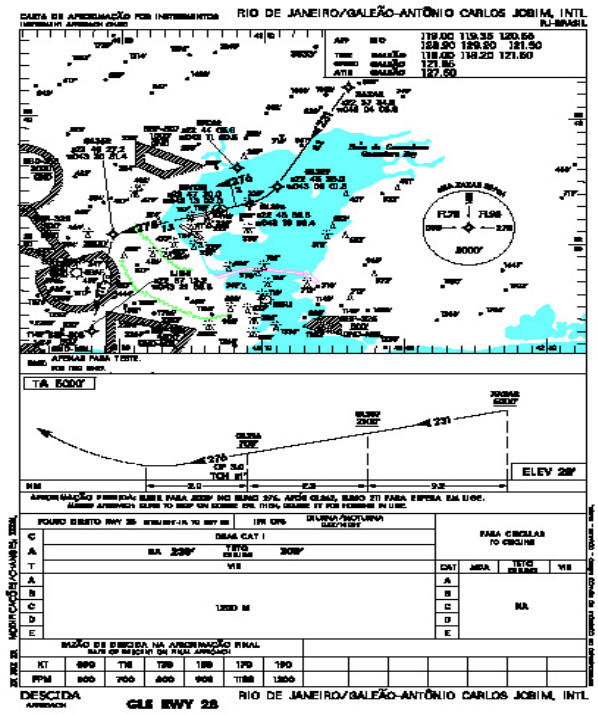
2.1.3 Flight tests are performed using H-800XP aircraft from Brazilian Flight Inspection Group, using a removable MMR GNLU-930 (red label) that has been sent to FAA recently to update software version FC-34 (with the latest TAP version).

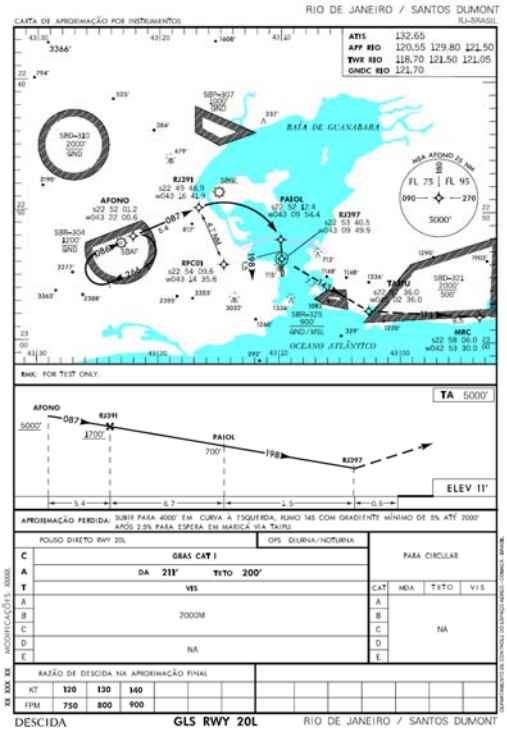


2.1.4 The new Flight Inspection Systems installed in the EMBRAER EMB-110 aircrafts already have the capability of operating the GNLU-930.

EMBRAER EMB-110 new AFIS

2.1.5 There are 05 “straight in” and 02 Terminal Approach (TAP) test procedures designed for Galeão, Santos Dumont and Afonsos Airports.





Terminal Approach Procedures (Galeão and Santos Dumont)

2.2.1 **Ongoing activities**

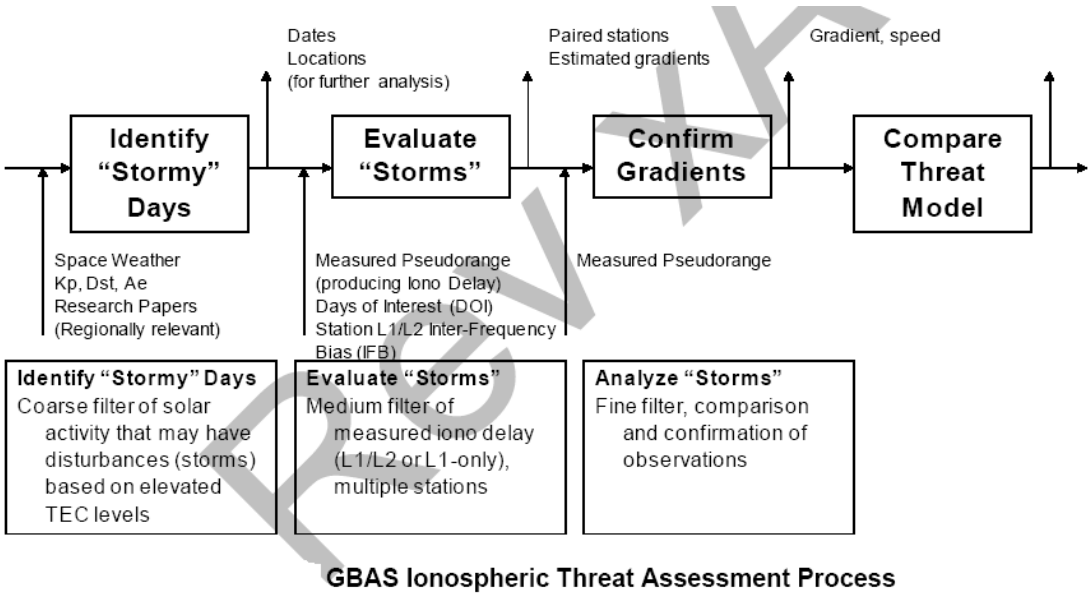
2.2.2 As an ionosphere threat model doesn’t exist for regions around the geomagnetic equator, it is really necessary to support perform detailed studies, complemented with experimental activities, in order to improve the knowledge about how ionosphere really can impact the GBAS.

2.2.3 Thus, in 2009, DECEA and HONEYWELL signed a Memorandum of Understanding (MOU), in order to assess iono data that has been collected since 2001 in Brazil.

2.2.4 According to the MOU terms, DECEA has provided HONEYWELL with GPS data collected from 04 different sources:

- ✓ Brazilian SBAS Testbed (Novatel Milleniun Receivers) - Sep2001/Jun2004
- ✓ LAAS TEST PROTOTYPE (Novatel Milleniun Receivers) - Oct2003/Nov2008
- ✓ Local GPS Data Collection (ASHTECH ZXTREME) - Oct2006/Nov2008
- ✓ Brazilian Continuous Monitoring Network (RBMC) - Jun2000/Dec2008 (http://www.ibge.gov.br/home/geociencias/geodesia/rbmc/rbmc_est.shtm)

2.2.5 Using the data, HONEYWELL is comparing the Continental US (CONUS) ionospheric threat model to the Brazilian environment, using the assessment process showed bellow. The study has not yet been concluded.



GBAS Ionospheric Threat Assessment Process

2.2 **Future work**

2.2.6 By the end of 2009, DECEA has started a bidding process in order to acquire a GBAS station for Rio de Janeiro International Airport until December 2010, to face the next solar cycle peak, performing data collection and flight tests with Flight Inspection Group and voluntary Airlines.

2.2.7 Product, Facility and Service approval for GBAS in Brazil will only be possible after going through the next solar cycle peak for operational safety reasons.

2.2.8 A GBAS Ground Monitor will be assembled at FAA Technical Center and installed at Santos Dumont Airport to provide continuous performance monitoring of the above mentioned GBAS station.

2.2.9 By 2011, it is expected that 04 H-800XP will be upgraded with GBAS capabilities (Automatic Pilot and Flight Inspection).

2.2.9 In the future, DECEA will also have to update the national regulations regarding the use of GBAS and establish training programs for pilots, maintenance and ATC personnel.

2.2.10 The decision of installing GBAS in other airports, using the knowledge and the lessons learned at Galeão`s Project, will be based on the assessment of particular demand and cost benefit for each main airport in Brazil.

3. SUGGESTED ACTION

3.1 The meeting is invited to:

a) note the information presented in this paper providing an overview of the GBAS project in Brazil; and

b) consider the information presented in this paper as a way towards the harmonization of the activities related to GBAS in the CAR/SAM Region.

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