



International Civil Aviation Organization

THE FIFTH MEETING OF IONOSPHERIC STUDIES TASK FORCE (ISTF/5)

Okinawa, Japan, 16 – 18 February, 2015

Agenda Item 3: Review of status of States' activities

STATUS OF IONOSPHERE STUDIES IN GNSS IMPLEMENTATION IN CHINA

(Presented by China)

SUMMARY

This paper presents ionosphere studies on GNSS implementation in civil aviation in China. Long term variations, ionosphere anomaly, and proposed program have been analyzed.

1. Introduction

1.1 To promote GNSS implementation and application in civil aviation in China, ATMB (Air Traffic Management Bureau) has been constantly investing and supporting ionosphere studies. GRIMS (Ground Regional Integrity Monitoring System) has been established since 2004 to promote GNSS's integrity. Ionosphere studies from GRIMS raw data is one of important aspects of system evaluation.

1.2 Besides GRIMS raw data, data from seven IGS sites in China and simulated data have been utilized to analyze the performance of various augmentation systems proposed by industry.

1.3 Honeywell SmartPath SLS4000 ground based augmentation system (GBAS) has been installed in Shanghai Pudong Airport. Performance evaluation and flight inspection will be planned soon.

2. Discussion

2.1 Long term variations of ionosphere over China have been characterized by using GRIMS and IGS raw data. It is shown that ionosphere could vary very differently in mid latitude and low latitude. Although in most time ionosphere varies smoothly, it could sharply increase or decrease frequently in low latitude.

2.2 Ionosphere anomaly induced integrity risk could increase very large and pose great threat for GBAS and SBAS, even dual frequency GBAS could not eliminate all the ionosphere effects in GNSS implementation. The effects of ionosphere threat in the framework of ABAS, single frequency based GBAS, dual frequency based GBAS, networked GBAS and SBAS have been analyzed and assessed. Data gap in low latitude receivers occurs very frequently.

2.3 Program to expand current GRIMS architecture to incorporate more sites with added function of ionosphere monitoring and BDS signal processing has been proposed.

2.4 Honeywell SmartPath SLS4000 ground based augmentation system (GBAS) has been installed in Shanghai Pudong Airport. Performance evaluation and flight inspection will be planned soon. Ionosphere related data will be collected for analysis.

3. Action required by the Meeting

3.1 The meeting is invited to do the following:

- a) to note the China's activities in ionosphere studies for GNSS implementation in civil aviation and support to ISTF; and
- b) to discuss any relevant matters as appropriate.
