International Civil Aviation Organization

THE SIXTH MEETING OF IONOSPHERIC STUDIES TASK FORCE (ISTF/6)

Bangkok, Thailand, 19 – 21 January 2016

Agenda Item 3: Review of status of States' activities and ISTF webconferences

IONOSPHERE RELATED ACTIVITIES IN GNSS IMPLEMENTATION IN CHINA

(Presented by China)

SUMMARY

This paper presents activities and status of ionosphere studies in GNSS implementation in China.

1. INTRODUCTION

1.1 Following the recommendations and guidelines provided by ICAO, China has been actively promoting GNSS application in Civil Aviation. GRIMS (Ground Regional Integrity Monitoring System) has been established since 2004 to monitor GPS satellites' integrity in order to ensure requirements of flight phases from en-route to NPA are met.

1.2 On December 27 2012, BDS has commenced provision of formal regional service. Since the successful launch of the 20th BDS satellite on September 30 2015, BDS has been continuously providing stable service for vast users.

1.3 GRIMS has been upgraded from receiving GPS only signals to receiving both GPS and BDS signals and the number of the sites will be expanded from currently 8 to more than 30, in order to provide denser and wider coverage. The more than 30 sites also provide opportunities for extract detailed characterizations of ionosphere over China area.

2. DISCUSSION

Data collection

2.1 Based on availabilities of raw data from current 8 sites, it is appropriate to extract ionosphere characteristics around specific sites. However, the overall ionosphere characteristics related to GNSS integrity can only be roughly estimated, because each baseline length between any two sites exceed over 1000 km, thus ionosphere over such great distance becomes spatially decorrelated.

2.2 It is planned in the next five years, the number of GRIMS monitor sites will increase to more than 30, and the average baseline length will decrease to about 200km. It is thus expected to get more information about ionosphere over China area.

2.3 As receivers in GRIMS has been upgraded to receive both GPS and BSD signals, the number of ionosphere pierce points has doubled than GPS-only receivers, the advantage will be taken to improve accuracy during the process of estimating ionosphere delays.

Iono Analysis

2.4 A commercial Ground Based Augmentation System (GBAS) has been installed in Shanghai Pudong Airport. An A321 and a B738 airplane has completed the approach procedure in Shanghai Pudong Airport. A prototype GBAS has been installed in Tianjin Airport. Both GBASs' performance will be evaluated continuingly with the support of the analysis of data from GRIMS and IGS.

2.5 Ionosphere induced integrity risk and its impact on GBAS and SBAS will be analyzed following the ICAO guideline and take advantage of more ionosphere pierce point provided by BDS.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this papers; and

b) discuss any relevant matters as appropriate.

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