

**59<sup>th</sup> CONFERENCE OF  
DIRECTORS GENERAL OF CIVIL AVIATION  
ASIA AND PACIFIC REGIONS**

*Cebu, Philippines  
14 to 18 October 2024*

**AGENDA ITEM 4: AIR NAVIGATION**

**PREPARATION FOR FUTURE GBAS/SBAS  
IMPLEMENTATION IN THE PHILIPPINES**

(Presented by Civil Aviation Authority of the Philippines)

**INFORMATION PAPER**

**SUMMARY**

This Information Paper aims to provide an update on the recent activities of the Civil Aviation Authority of the Philippines (CAAP) in the preparation for future implementation of GBAS/SBAS in the Philippine FIR. This includes the adoption of the GBAS/SBAS Implementation guidance document from ICAO subject to its revision and finalization.

This also includes inter-state collaborative efforts to further investigate technical and economic viability in the Philippine setting.

## **PREPARATION FOR FUTURE GBAS/SBAS IMPLEMENTATION IN THE PHILIPPINES**

### **1. INTRODUCTION**

1.1 Ground-based Augmentation Systems (GBAS) and Satellite-based Augmentation Systems (SBAS) are part of GNSS based navigation. GBAS & SBAS have been in development for quite some time already and have been encountering challenges in its development and performance. One of the most glaring hurdles among others are the effects of the ionosphere especially in the low-latitude regions which unfortunately includes the Philippines. As civil aviation has grown substantially over the years, reliance on GNSS has also increased, supporting various navigation operations such as Area Navigation, Required Navigation Performance, and Performance-Based Navigation. In the near future, in aligning with the concept of trajectory-based operations (TBO), GBAS & SBAS may be deployed therefore, the identified challenges must be mitigated.

1.2 The International Civil Aviation Organization (ICAO) has acknowledged the presence of GBAS/SBAS emerging technologies and needs to make preparations for interoperability with other GNSS-based navigation and guidance systems in achieving a seamless, global, and efficient air navigation system. GBAS and SBAS can still be considered as an emerging technology and are still in its stages of infancy, thus, it is marred with quite a number of challenges, other than the ionospheric effect, it is also affected by GNSS radio frequency interference (RFI) which can compromise the integrity and availability of GNSS signals, thus affecting the safety and efficiency of civil aviation operations.

1.3 To address these challenges, ICAO, regional aviation authorities, equipment manufacturers and air operators are collaborating thru the ICAO APAC GBAS/SBAS Implementation Task Force (ITF) in establishing policies and procedures on how to implement a state / regional plan on for GBAS/SBAS implementation.

### **2. DISCUSSION**

2.1 The 6th ICAO-APAC GBAS/SBAS Implementation Workshop, with the Philippines as participant, has already drafted a GBAS safety assessment guidance document related to anomalous ionospheric conditions and has endorsed to and adopted by the ICAO CNS-SG/27.

2.2 The 6th ICAO-APAC GBAS/SBAS Implementation Workshop, with the Philippines as participant, has already drafted an SBAS safety assessment guidance document related to anomalous ionospheric conditions and has endorsed to and adopted by the ICAO CNS-SG/27.

2.3 The CAAP in collaboration with the Government of Japan has co-hosted GNSS Implementation Plan Training for ASEAN (GIPTA), a project involving all ASEAN member-states to prepare for future implementation of GBAS and SBAS.

2.4 The CAAP in collaboration with the Government of Japan, JCAB and JRANSA shall install in Manila in 2025, GNSS Analyzer Equipment and SBAS simulator equipment to be networked with Bangkok, Jakarta and Hanoi to evaluate future SBAS performance in the ASEAN region.

2.5 The CAAP has already initiated the second-phase of GIPTA and will co-host together with the Government of Japan a workshop for ASEAN member-states in Manila in 2026, related to GNSS Implementation Plan Training.

2.6 The CAAP has engaged with a GBAS manufacturer to acquire a Rough Order of Magnitude for planning and budgeting purposes.

2.7 The CAAP as Administrator has adopted provisions on ICAO Doc 9849 covering GNSS.

**3. ACTION BY THE CONFERENCE**

- 3.1 The Conference is invited to note the information contained in this Paper.

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