International Civil Aviation Organization

THE SIXTH MEETING OF THE ASIA/PACIFIC GBAS/SBAS IMPLEMENTATION TASK FORCE (APAC GBAS/SBAS ITF/6)

(Bangkok, Thai, 7th- 9th May 2024)

Agenda Item 3: Updates from States/Administrations about GBAS/SBAS Implementation

MSAS program update
(Presented by JCAB)

SUMMARY

This paper provides a status of MSAS program in Japan.

1. INTRODUCTION

1.1 The Civil Aviation Bureau of Japan (JCAB) MSAS program summary in regard with PBN implementation Status, LPV250 trial operations, R&D for LPV200, and GNSS monitoring activities are described as follows.

2. DISCUSSION

2.1 PBN implementation Status

JCAB provides Performance Based Navigation (PBN) services in align with the Collaborative Actions for Renovation of Air Traffic Systems (CARATS) program established in 2010 in Japan.

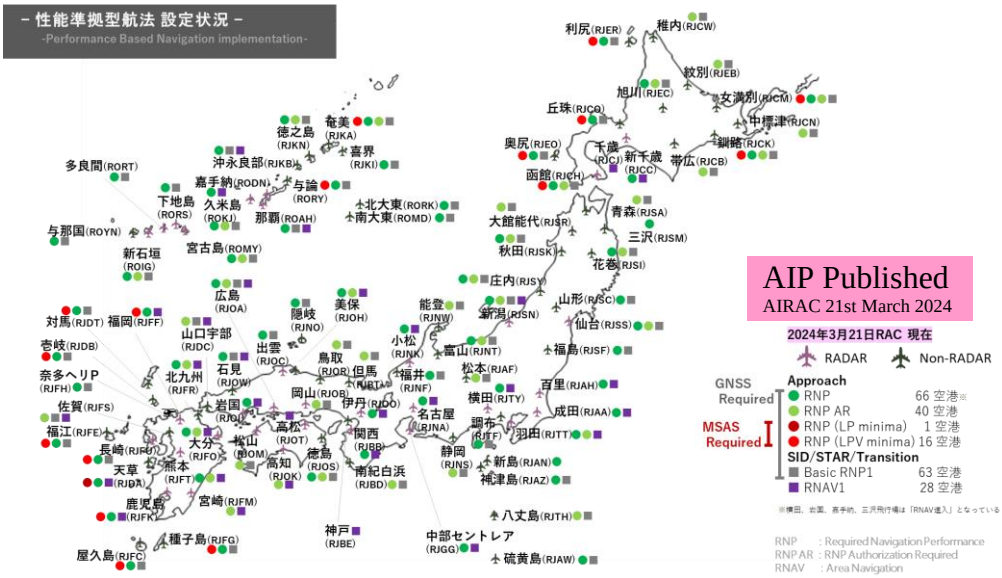

Figure 1. PBN implementation and down to LPV minima

2.2 LPV250 trial operations

The Michibiki satellite-based Augmentation Service (MSAS) was declared operational in 2007 limited for phase of flight from En route to non-precision approach (ER/NPA) due to ionospheric effect. Under current Aeronautical Information Circular (AIC) of Japan, Commercial flight-based trial operations regarding Required navigation Performance (RNP) approach procedures down to Localizer Performance with Vertical Guidance 250 (LPV250) minima is ongoing with limited time through Notice to Airmen (NOTAM) at Seventeen airports in Japan. The trial operations contribute increase opportunities for landing at local airport and reduce CO2 emission. The feedback from the operators identifies the need improve areas of system performance.

In addition to local airports, the one of the congested airports is also used for LPV250 trial. Wide body aircraft such as A350 operated by Japan Airlines (JAL) have been joined to the trial since April 2023.

2.3 R&D for LPV200

The Network Performance Assessment Centre (NPAC) has preliminary assessed the performance of LPV250 trial operations with concerning time-limiting NOTAM for the procedure that is uncomfortable from an airline operational standpoint. The preliminary assessment has helped JCAB review of current trial. Recognizing operational comfortability, JCAB and Technical Management Centre (TMC) are studying acceptable “Step-by-step” based deployment instead of “Ship together” basis regarding scheduled additional two satellites, thirteen reference station dedicated for ionosphere pierce point (IPP) using multi Global Navigation Satellite System (GNSS) including Quasi-Zenith Satellite System (QZSS), system/software upgrade for LPV200.

The Research and development activities on Dual Frequency Multi constellation MSAS (DFMC MSAS) including message authentication using L5 QPSK signals are undergoing at the Electronic Navigation Research Institute (ENRI).

The SBAS Message Authentication Concept of Operations (CONOPS) is being developed for context and justification to the SBAS Authentication SARPs at the SBAS Authentication Ad-Hoc group under GNSS SARPs Working Group (GSWG) in the Navigation System Panel (NSP). JCAB has started to review the CONOPS based on the GNSS RFI event occurred in Autumn 2021 in the Oceanic airspace within Fukuoka FIR.

2.4 GNSS monitoring activities

JCAB established the NPAC in 2020 for the mission of MSAS Master Control Station, GPS RAIM /MSAS Prediction, GNSS core system / SBAS performance monitoring, Reporting flamework on GNSS aircraft receiver malfunctions (including RFI, Jamming and spoofing), and information/NOTAM outreach. Those synergized capabilities based on GNSS manual (Doc9849) are beneficial for aviation safety.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper.

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