International Civil Aviation Organization

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

(Bangkok, 7- 9 May 2024)

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

GBAS IMPLEMENTATION STATUS IN MALAYSIA

(Presented by name of States/Administration)

SUMMARY

This paper presents GBAS Implementation status and progress in Kuala Lumpur International Airport (KLIA), Malaysia.

1. INTRODUCTION

1.1 Ground-Based Augmentation System (GBAS) has been installed in Kuala Lumpur International Airport (KLIA) to support PBN approach procedures CAT 1 for all runways in KLIA.

1.2 The primary aim of the implementation of GBAS is to supplement and support the precision approach CAT 1 in KLIA besides the ILS approach. It will also become another optional approach procedure along with other navigational performances such as RNP APCH and RNP-AR. The long-term goal of GBAS in Malaysia is to fully replace the dependency on ILS. At the moment KLIA uses six (6) ILSs as its main approach navigational infrastructure.

2. DISCUSSION

Kuala Lumpur Ionospheric Analysis

2.1 Ionospheric Analysis for Kuala Lumpur International Airport was carried out by Honeywell, between 11th September 2017 until 10th September 2018. The purpose of the analysis is to determine the effect of ionospheric disturbance on GPS including:

a) Overview of the Low Latitude Environment;
b) Scintillation, which makes signal reception difficult for GPS receivers;
c) Plasma Bubble Gradients, which have the potential to cause errors between the GBAS and aircraft;
d) Plasma Bubble Threat;
e) Daytime Low Latitude Iono Mitigation; and
f) Daytime Hours of Operation.

2.2 Based on the ionospheric analysis, it is recommended to schedule Kuala Lumpur GBAS operations between 10 PM and 6 AM (Local Time). Additionally, ongoing evaluation of the ionosphere environment for Kuala Lumpur should continue to assess whether any adjustments are necessary during the next solar cycle.

GBAS Inspection, Commissioning & IFP Flight Validation

2.3 GBAS flight inspection and commissioning were carried out by the AeroPearl Flight Inspection Service from the 19th to 21st of November 2019. This validation work consists of the following:

Flight inspection:

a) Coverage of VDB ground station;
b) Frequency spectrum of VDB frequency on either side in case of suspected interference;
c) Frequency spectrum of GPS frequency when GPS parameters indicate possible RF interference;
d) Satellite availability at aircraft; and
e) Satellite Constellation.

Additional parameters checked on the ground:

a) Final approach segment (FAS) data;
b) Integrity data;
c) Differential correction data; and
d) Satellite signal availability, constellation, interference, and multipath at ground station.

GBAS Implementation Plan

24. To support the implementation of the Ground-Based Augmentation System (GBAS) approach procedure at Kuala Lumpur International Airport (KLIA), the Civil Aviation Authority of Malaysia (CAAM) has devised the following plan:

a) GBAS equipment certification and operation approval by CAAM regulator;
b) Preparation of Instrument Flight Procedurel;
c) Flight trial by Local Airlines;
d) Operational safety assessment;
e) Training or operational briefing to Air Traffic Controller;
f) AIP publication; and
g) Continue monitoring of GBAS operation.

3. ACTION REQUIRED BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and
b) discuss any relevant matters as appropriate.

– – – – – – – – – – – – –