



ICAO

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Advisory Group (RASMAG/30)

Bangkok, Thailand, 14 – 17 July 2025

Agenda Item 5: Airspace Safety Monitoring Activities/Requirements in the Asia/Pacific Region

THE RESULT OF THE EVALUATION OF AHMS FOR HEIGHT MONITORING

(Presented by JASMA)

SUMMARY

This paper presents the result of the evaluation about the updated Height Monitoring System using ADS-B (AHMS: ADS-B Height Monitoring System).

1. INTRODUCTION

1.1 The Japan Airspace Safety Monitoring Agency (JASMA) has the Regional Monitoring Agency (RMA) responsibilities for the Pacific Ocean airspace of Fukuoka Flight Information Region (FIR). The Height Monitoring Unit (HMU) is an essential device for measuring the altitude of the aircraft in Reduced Vertical Separation Minima (RVSM) airspace and monitoring altitude error.

1.2 As reported at RMACG/19, Japan is working on updating HMUs, which uses En-route Wide Area Multilateration*(WAM) to measure vertical error, according to the following schedule (**Figure 1**). The Setouchi HMU is currently undergoing evaluation. The Sendai and Niigata HMUs will follow the Setouchi HMU.

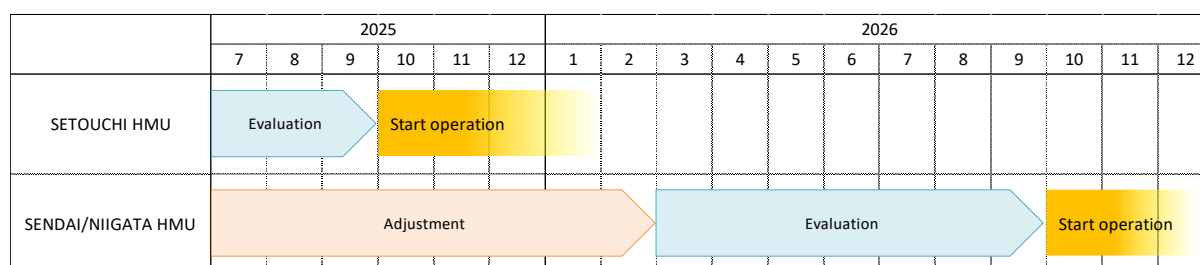


Figure 1: The schedule of updating HMUs

1.3 The new HMU is using En-route WAM for ground stations. In addition, it has the ADS-B Height Monitoring System (AHMS). AHMS is capable to monitor the vertical deviation by receiving ADS-B signal. From 19 Jan 2025 to 26 Jan 2025, the manufacturer has evaluated the capabilities of a new HMU and AHMS respectively.

2. DISCUSSION

2.1 The result of evaluation of HMU shows below **Figure 2**. Mean ASE is within criteria(In following figures (**Figure 2-4**), each red line frame shows the range of criteria. i.e. ASE: ± 245 ft).

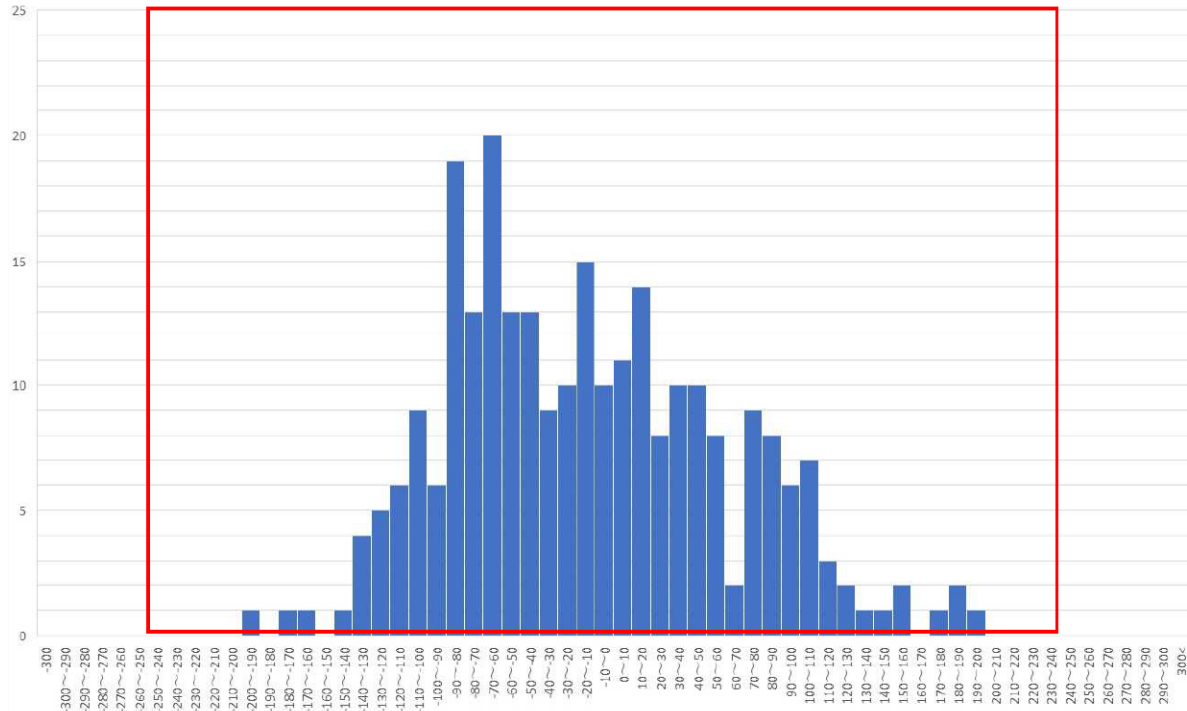


Figure 2: Mean ASE(HMU)

2.2 The result of the evaluation show below. Regarding ASE(**Figure 3**), most of data is within criteria, but some of them is out of criteria.

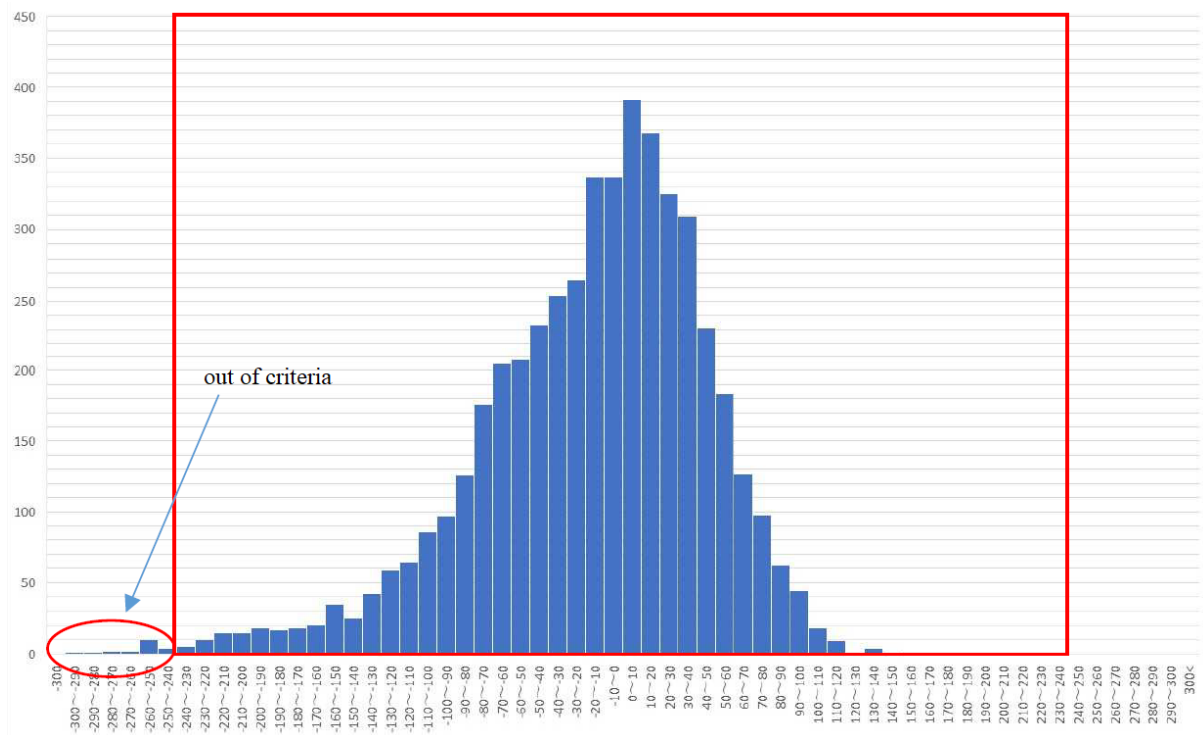


Figure 3: Mean ASE(AHMS)

2.3 Upon closer inspection, these outliers were found to be the tracks of four aircraft equipped with ADS-B version 0. In addition, the geometric height difference between HMU and AHMS was almost the same as the geoid height (approximately 121 ft). Therefore, it was speculated that these wakes were caused by HAG.

2.4 Therefore, a re-evaluation was carried out excluding the HAG flight track data. It was confirmed that the mean ASE (Figure 4) was within criteria.

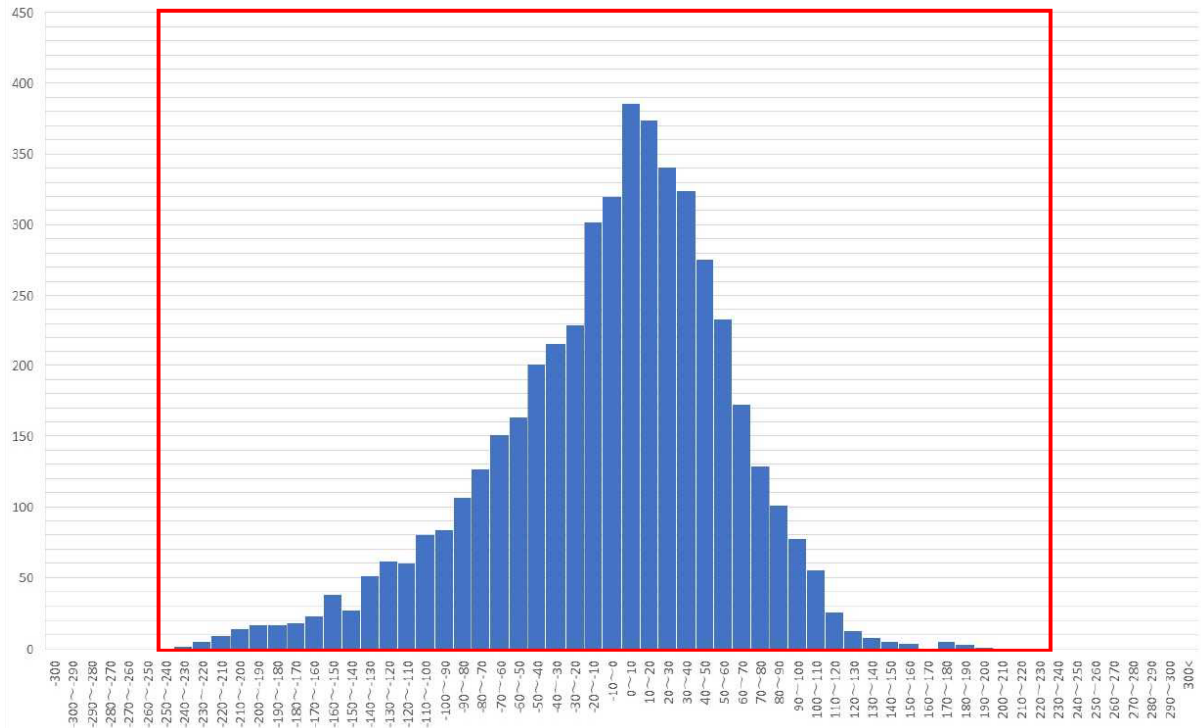


Figure 4: Mean ASE(AHMS: except HAG)

2.5 The results of this evaluation confirmed that measuring vertical deviation with AHMS has performance equivalent to that of HMU, however there is a issue that to distinguish HAE from HAG is a little bit annoyance. AHMS is equipped with the function to distinguish HAE from HAG.

2.6 It has been found that AHMS alone is functionally capable of measuring vertical deviation, but for the time being AHMS will be used as a complementary function to HMU.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) note the information contained in this paper; and

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