सत्यमेव जयते

नागर विमानन मंत्रालय , भारत सरकार

MINISTRY OF CIVIL AVIATION, GOVERNMENT OF INDIA

भारतीय विमानपत्तन प्राधिकरण

AIRPORTS AUTHORITY OF INDIA

ICAO APAC SBAS-GBAS IMPLEMENTATION WORKSHOP FOR AIRSPACE USERS

"Enhancing airport accessibility and safety on final approach with SBAS and GBAS"

14th to 16th October 2025

Bengaluru, India

Japan's GBAS implementation and airline's feedback

Ryuhei KAIKURA (Mr.)

Chief of the Section

CNS Planning Office, Air Navigation Service Engineering Division

Air Navigation Service Department, Civil Aviation Bureau (JCAB)

ICAO

Japan's GBAS implementation and airline's feedback

GBAS research

Nearly 30 years of research into Japanese GBAS production

Development Plan

Providers and users work together towards the same goal

Design ingenuity

Designed to suit the geographical environment facing Japan

Differences between trial operation and full operation

Start of trial and preparation for full operation

After start of operation

Operational status and comments from airline pilots

The future of Japan's GBAS

Towards further expansion of GBAS usage

ICAO

GBAS research

Nearly 30 years of research into Japanese GBAS production

ICAO

GBAS research

(courtesy of ENRI)

2002

Sendai Airport GBAS testbed development and flight experiments

(courtesy of ENRI)

1996

Electronic Navigation Research Institute begins research and development

(courtesy of ENRI)

2010

Kansai Airport GBAS prototype (CAT I) developed

B787 Inaguration

ICAO

2016

The Civil Aviation Bureau begins development of the GBAS (CAT-I)

2020

Trial operation of GBAS-16 (CAT-I) begins at Haneda Airport

(courtesy of ENRI)

2025.1

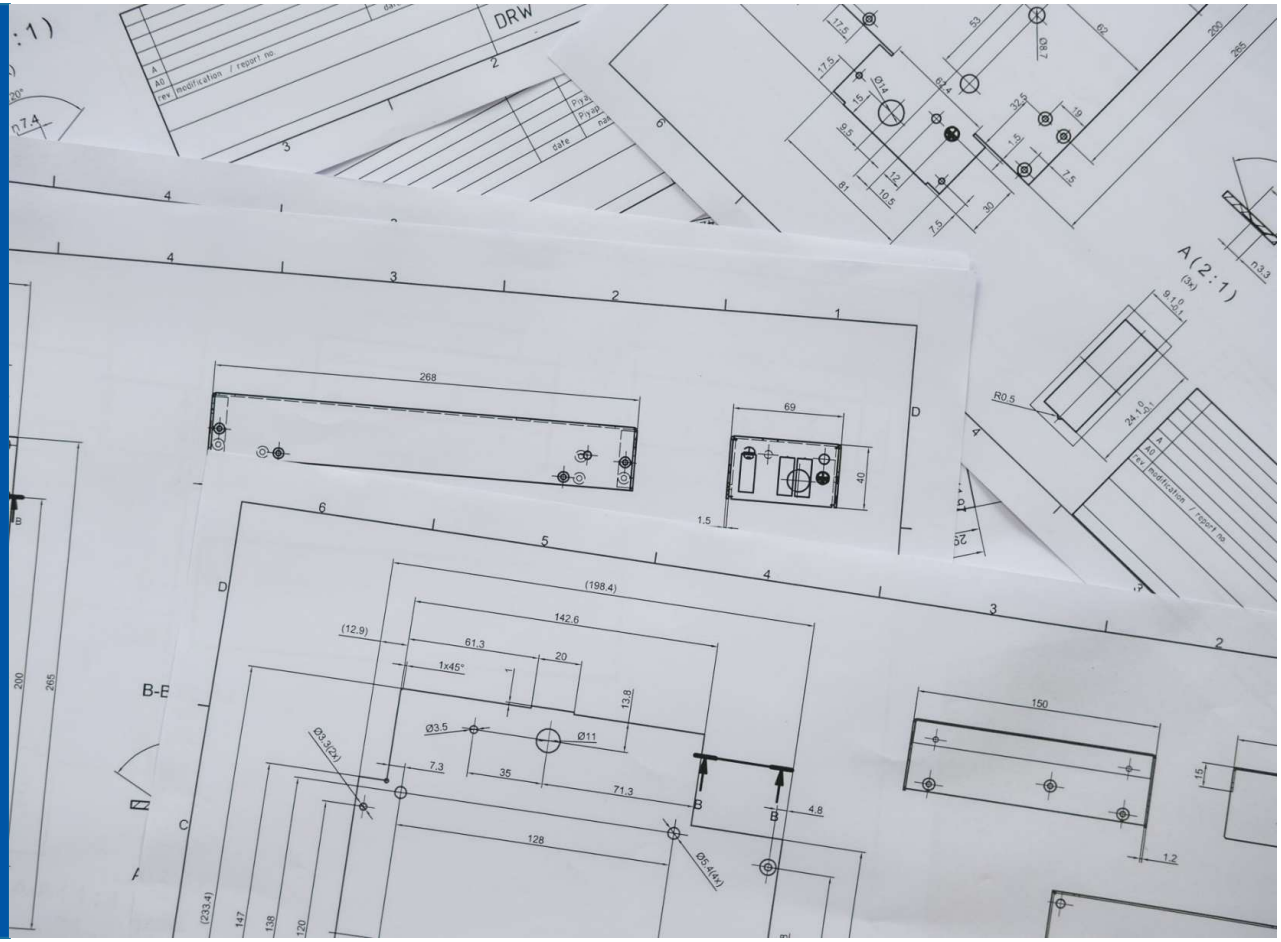
Haneda GBAS start of full operation

(courtesy of NEC)

02

Development Plan

Providers and users work together towards the same goal

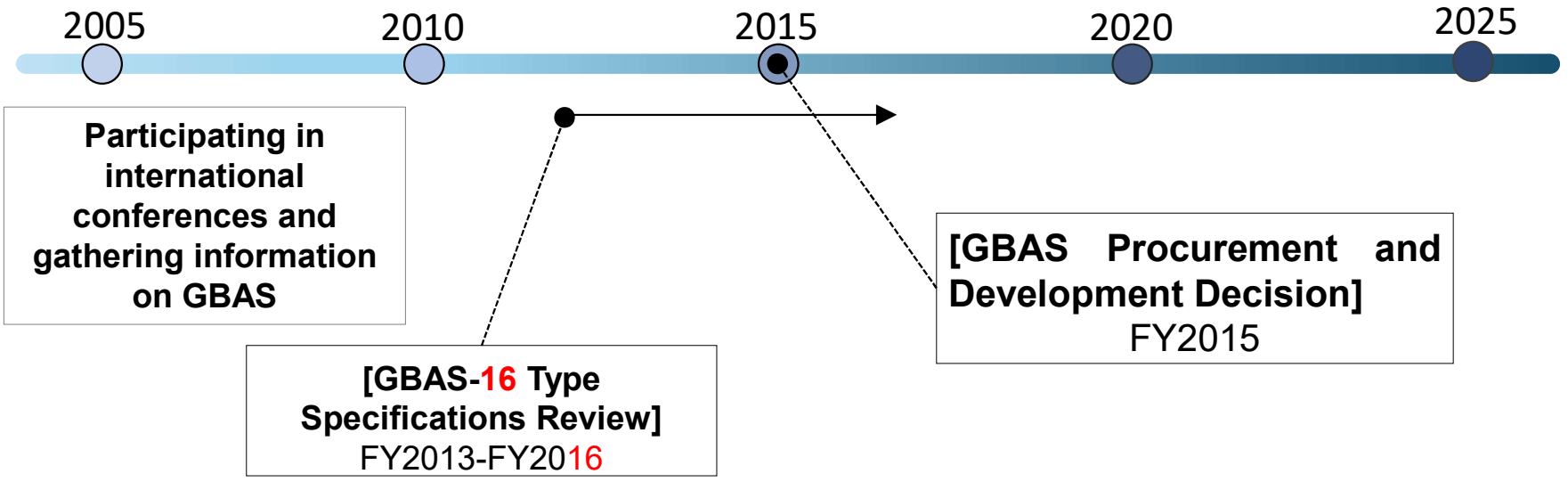


ICAO

1. Considering the introduction of Haneda GBAS

[Participation in international conferences and information gathering on GBAS]

- Participation in the ICAO Navigation Systems Panel (NSP)/GBAS Working Group (GWG)
- Participation in the International GBAS Working Group (IGWG)
- Information gathering for RTCA (SC-159 WG-4:GBAS) and EUROCAE (WG-28:GBAS)
- Participation in the ICAO APAC GBAS/SBAS Implementation TF



2. Manufacturing, Installation, Adjustment, Certification, Inspection, and Validation of Haneda GBAS

[Manufacturing / Installation / Adjustment]
FY2016-FY2018
Contract with NEC Corporation

[Flight Inspection and Flight Verification]
November 2019 - February 2020

2005 2010 2015 2020 2025

【 Certification 】
FY2016-FY2024
Provider (Air Navigation Services Department)
Various tasks required for Certification

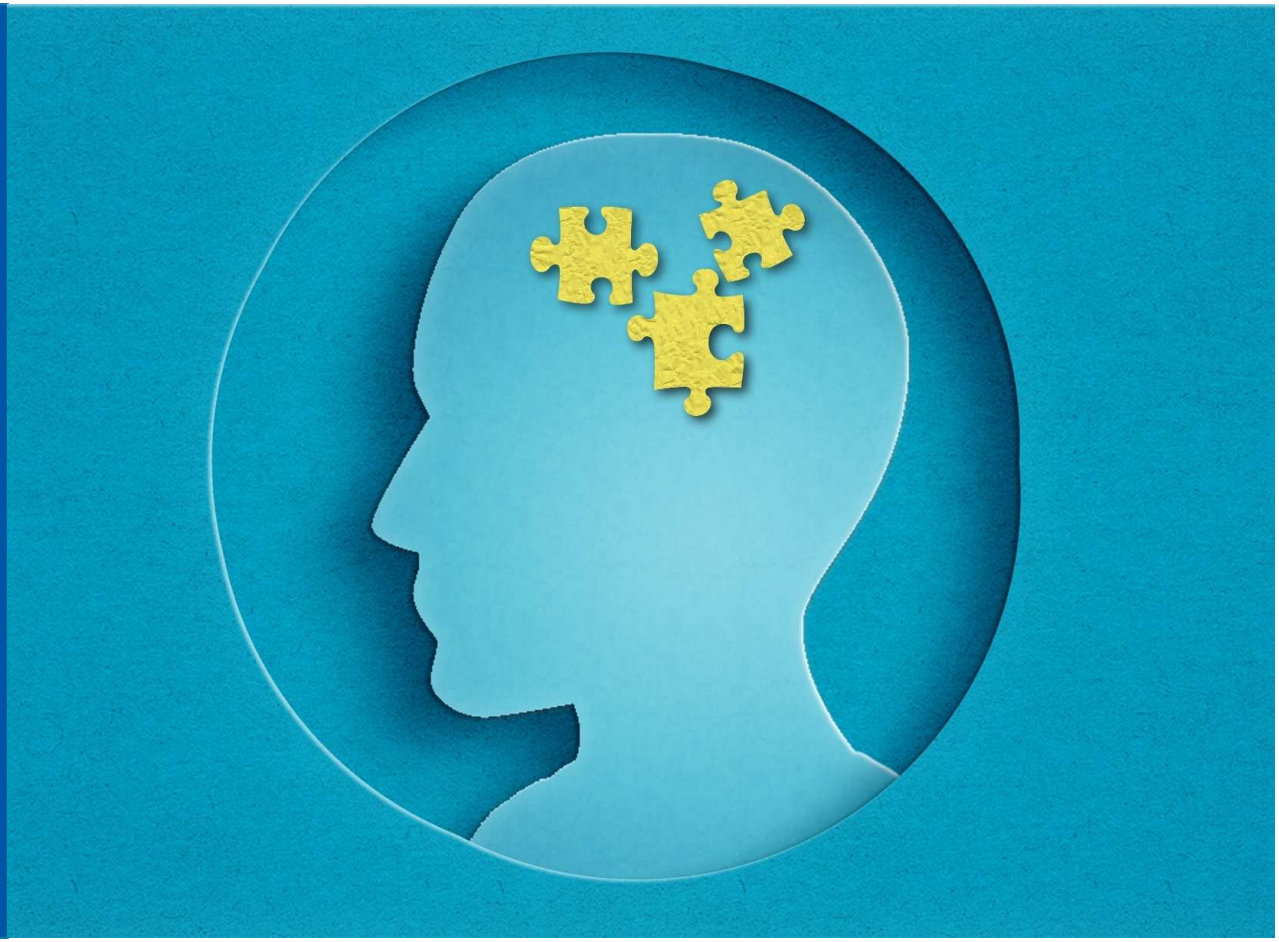
Regulator (Aviation Safety and Security Department)
Confirm safety and compliance with SARPs during the development process

[Haneda GBAS trial operation evaluation period]
July 2020 - July 2024 Total 336 flights

03

Design ingenuity

Designed to suit the geographical environment facing Japan



Components of Haneda GBAS

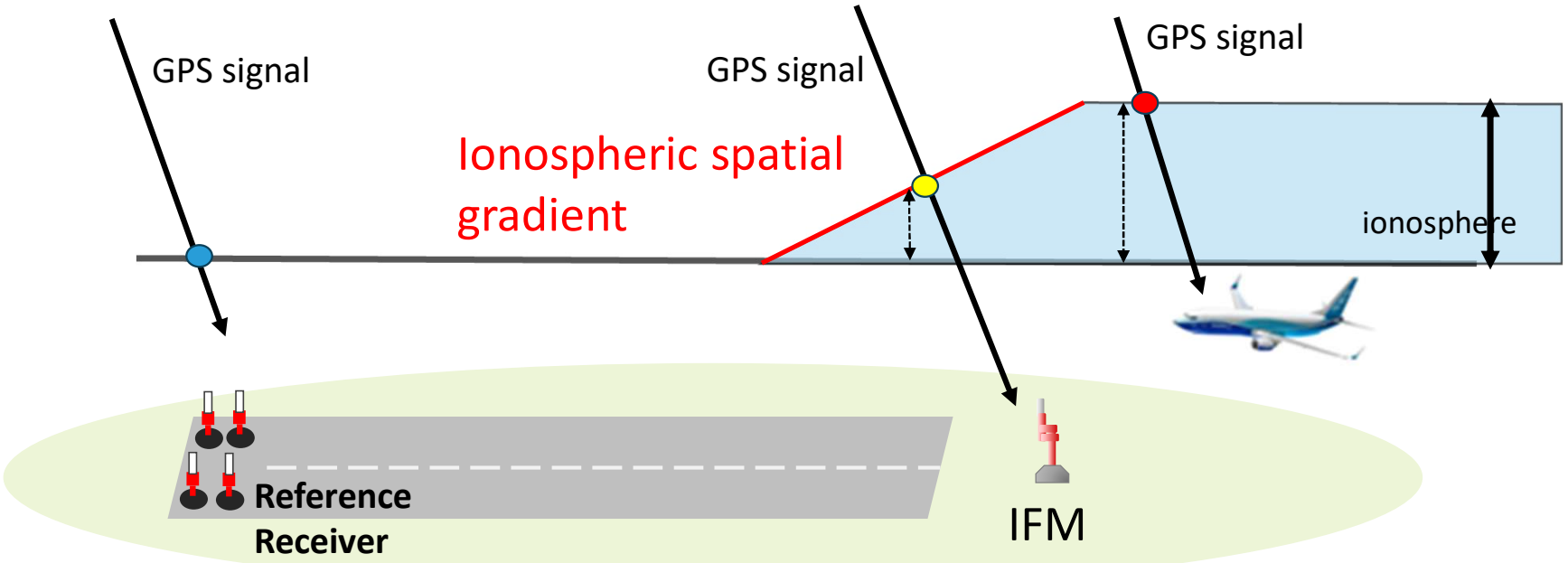
VDB(VHF Data Broadcast)
(2 units in total)

central
processing unit

Reference Receiver
(4 units in total)

IFM(Ionosphere Field Monitor)
(Koto LDA site approx. 7km ,
Umihotaru approx. 13km)

Ionospheric spatial gradient monitoring with IFM instruments



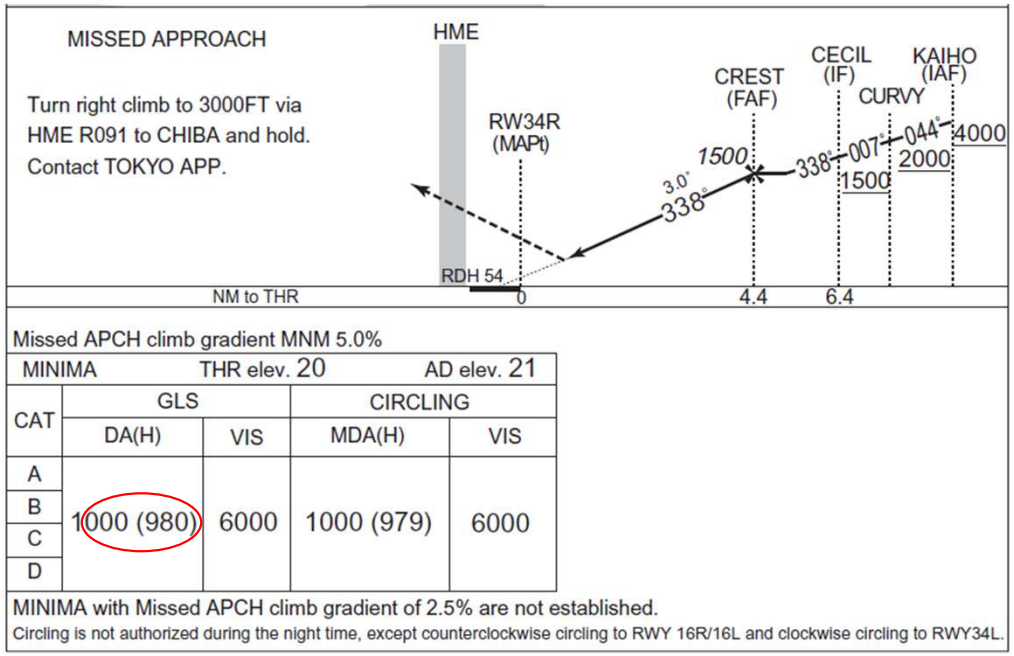
- ✓ The ionosphere exists above the atmosphere surrounding the Earth, and GPS signals are delayed as they pass through this ionosphere.
- ✓ Japan is located in a low magnetic latitude region , and a phenomenon called plasma bubbles, which causes local variations in ionospheric delays, could pose a threat to GBAS safety.
- ✓ **The IFM** performs positioning calculations by eliminating satellites detected as abnormal using an ionospheric spatial gradient monitoring algorithm developed by the Electronic Navigation Research Institute.

ICAO

04

Differences between trial operation and full operation

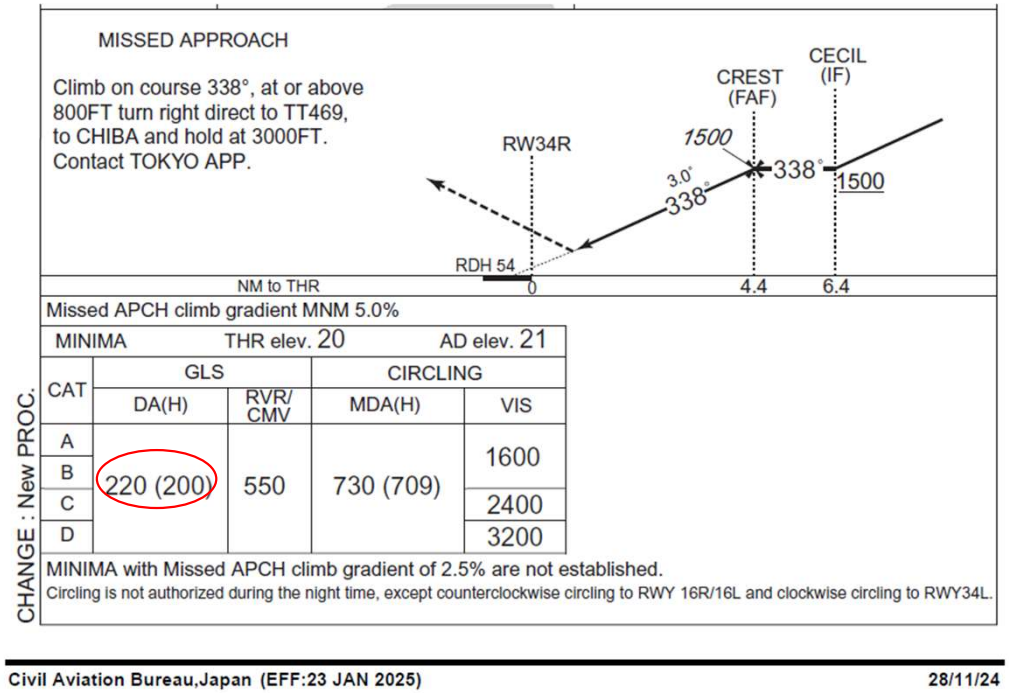
Start of trial and preparation for full operation



Missed APCH climb gradient MNM 5.0%

MINIMA	THR elev. 20		AD elev. 21	
CAT	GLS		CIRCLING	
	DA(H)	VIS	MDA(H)	VIS
A B C D	1000 (980)	6000	1000 (979)	6000

MINIMA with Missed APCH climb gradient of 2.5% are not established.
Circling is not authorized during the night time, except counterclockwise circling to RWY 16R/16L and clockwise circling to RWY34L.



CHANGE : New PROC.

Missed APCH climb gradient MNM 5.0%

MINIMA	THR elev. 20		AD elev. 21	
CAT	GLS		CIRCLING	
	DA(H)	RVR/ CMV	MDA(H)	VIS
A B	220 (200)	550	730 (709)	1600
C				2400
D				3200

MINIMA with Missed APCH climb gradient of 2.5% are not established.
Circling is not authorized during the night time, except counterclockwise circling to RWY 16R/16L and clockwise circling to RWY34L.

Civil Aviation Bureau,Japan (EFF:23 JAN 2025) 28/11/24

Haneda GBAS trial operation
AIP SUPPLEMENT
(NR038/21 25 MAR 2021)

Haneda GBAS operation
AIP Instrument Approach Chart
(EFF:23 JAN 2025)

05

After start of operation

Operational status and comments from airline pilots

Comments from the pilot

✅ **It was very stable compared to ILS.**

✅ **Stable operation was possible because the aircraft was not affected by traffic while taxiing.**

✅ **Want more operating hours.**

✅ **Concerned about the effects of GNSS RFI.**

✅ **It's a new procedure that has just been introduced, so it feels special.**

06

The future of Japan's GBAS

Towards further expansion of GBAS usage

The future of Japan's GBAS

- It's introduced the research conducted to date and the experiences leading up to the implementation of Haneda GBAS, which began operation in January of this year.
- There has yet been no record of a foreign airline used a GLS approach using Haneda GBAS.
- The first reason is that the ATIS information does not include "GLS." We are currently working on this and hope to resolve it soon.
- The second reason is the operating hours of GBAS. Because the number of aircraft that can land at Haneda Airport is limited within a limited time, we will strive to expand the operating hours.

Thank You!

ICAO