



Ministry of Land, Infrastructure, Transport and Tourism  
**Civil Aviation Bureau of Japan**



# **Current MSAS Status and Future Plan**

**EGNOS Service Provision Workshop 2016 at Warsaw, Poland**  
**27 - 28 September 2016**

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**JCAB, MLIT**

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- Current MSAS status
- Future Plan
- MSAS user segment & PBN

# Current MSAS Status

## □ MSAS: Japanese SBAS in operation

- MTSAT Satellite-based Augmentation System
- Operational since Sept. 27, 2007
- Continue stable operation with 1 GEO 2 PRNs

## □ Service for air navigation

- GPS Augmentation Information  
for RNAV, from En-route through NPA (RNP 0.3)
  - Within Fukuoka FIR
  - horizontal guidance only due to ionosphere
- NOTAM for Operational Information
  - Service Interruption
  - Service Prediction

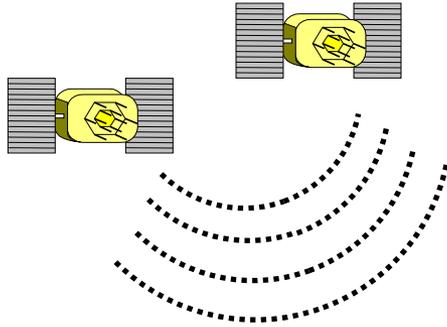
# Current MSAS Configuration

1 SAT 2PRNs

6 GMSs

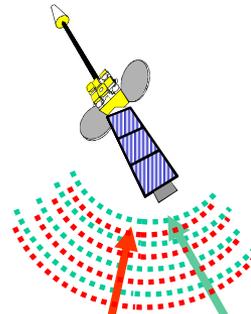
2 MCSs

GPS Constellation



MTSAT-2

Dual PRN Operation



User



PRN129

PRN137

GMS & MCS  
Kobe

GMS  
Fukuoka

GMS & MCS  
Hitachiota

GMS  
Tokyo

GMS  
Naha

GMS  
Sapporo



MCS Hitachi-Ota  
with GMS

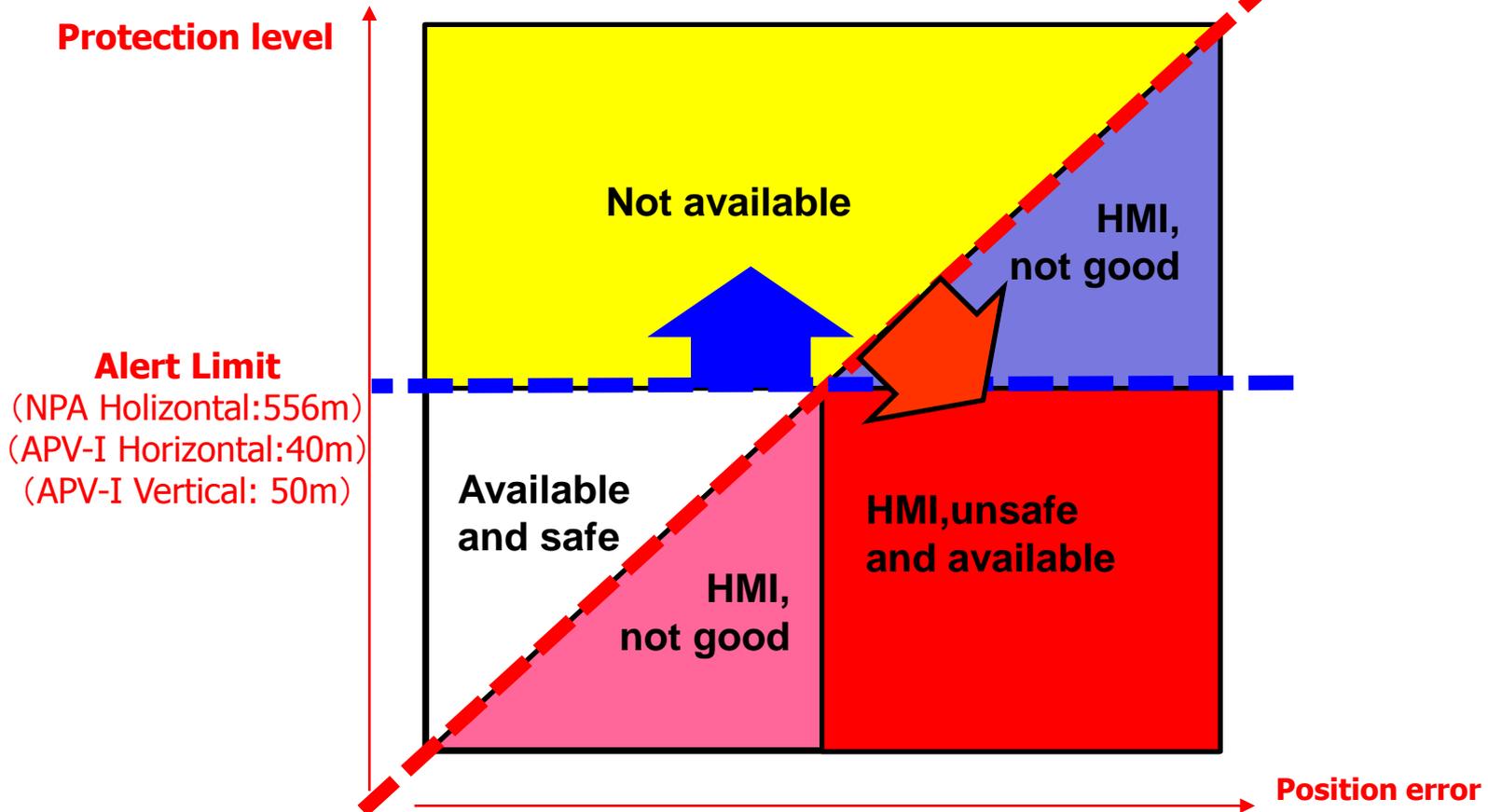


MCS Kobe  
with GMS

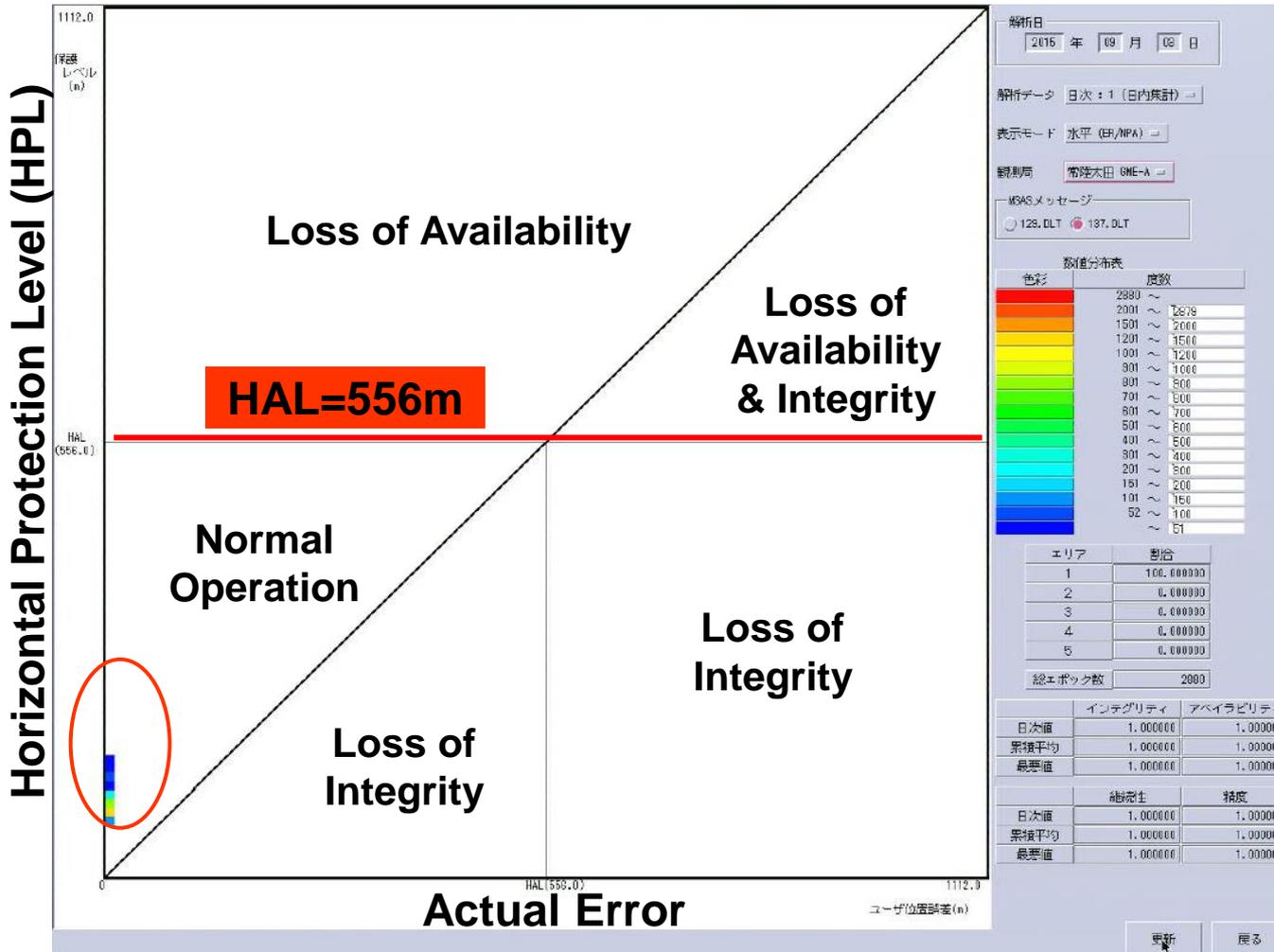
MCS: Master Control Station  
 GMS: Ground Monitor Station

# Integrity · Availability

**Stanford Chart**



# Typical Performance



2015/9/8  
(24 hours)

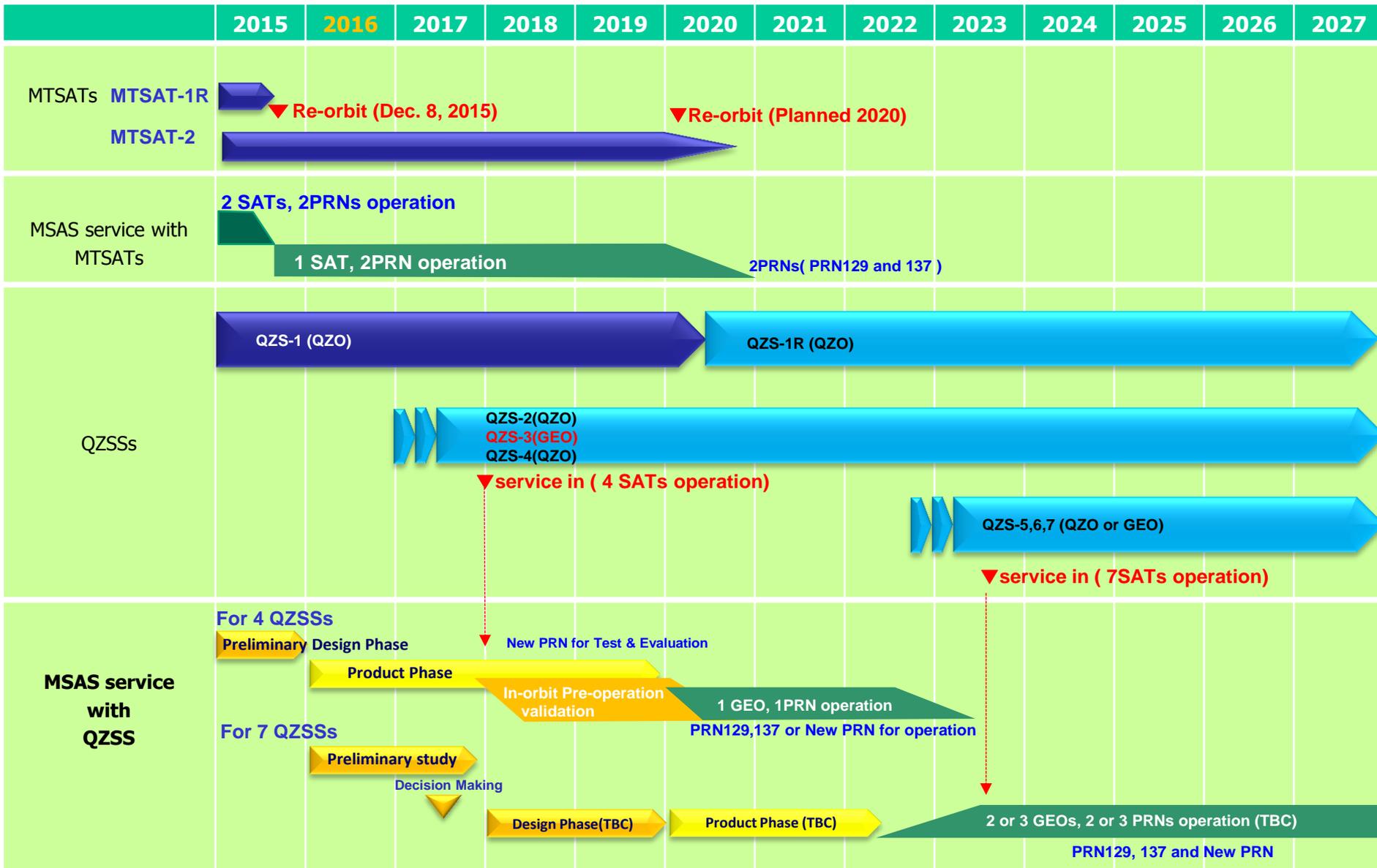
MSAS PRN137  
Evaluated at:  
HASC GME-A

• Extremely Safe Operation



# Future Plan

## Near-term schedule

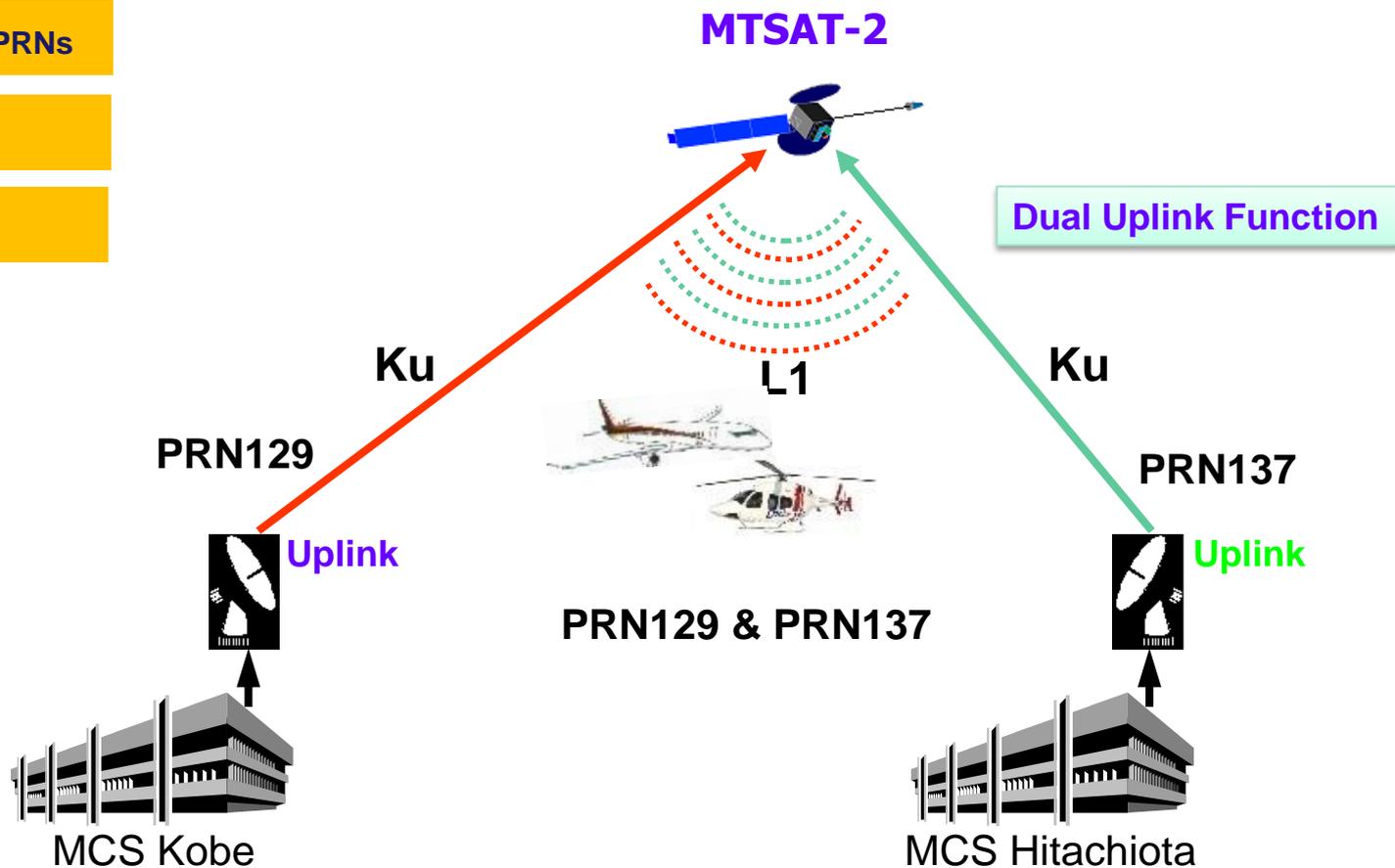


# MSAS Configuration (Now)

1 SAT 2 PRNs

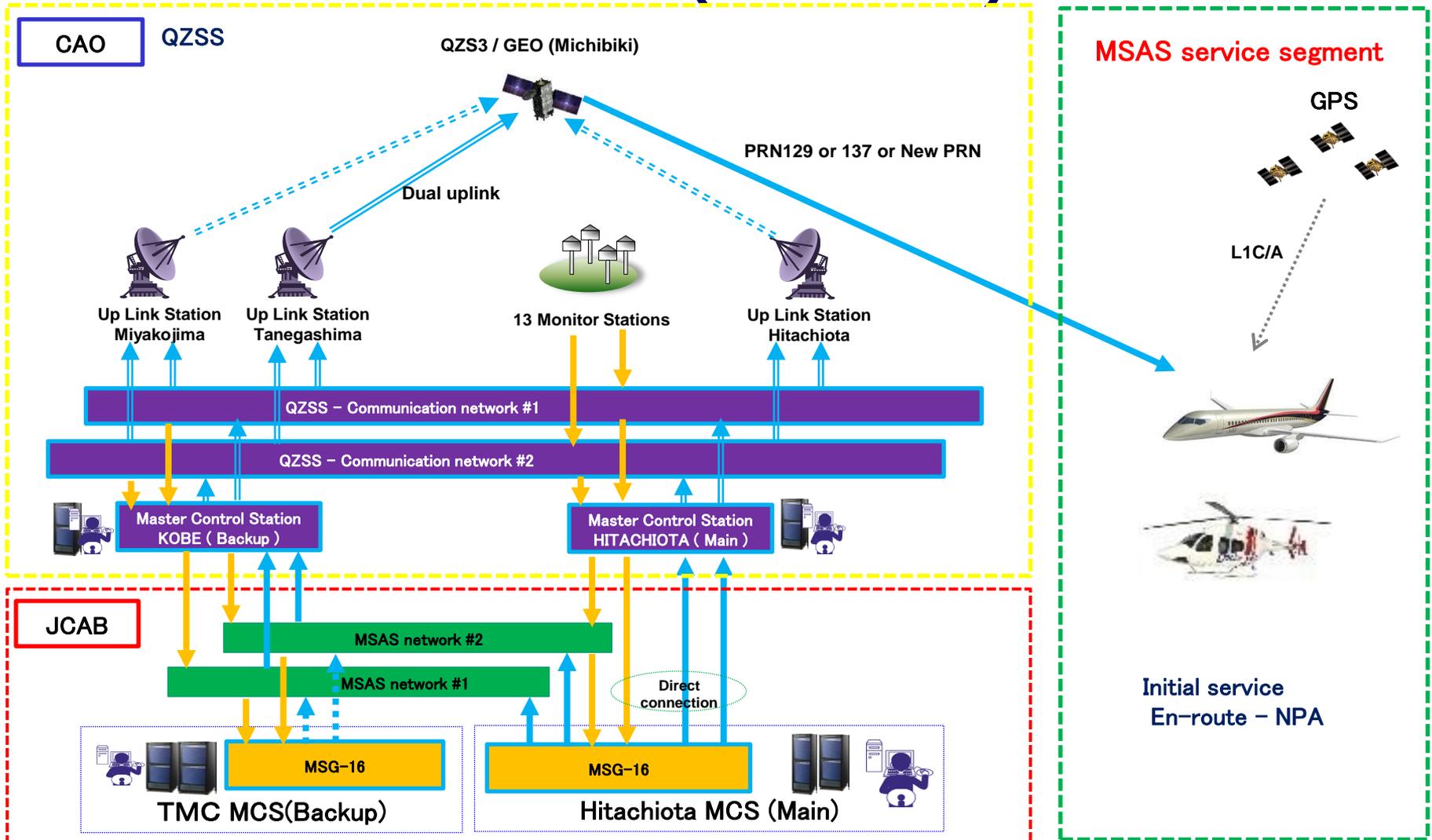
6 GMSs

2 MCSs

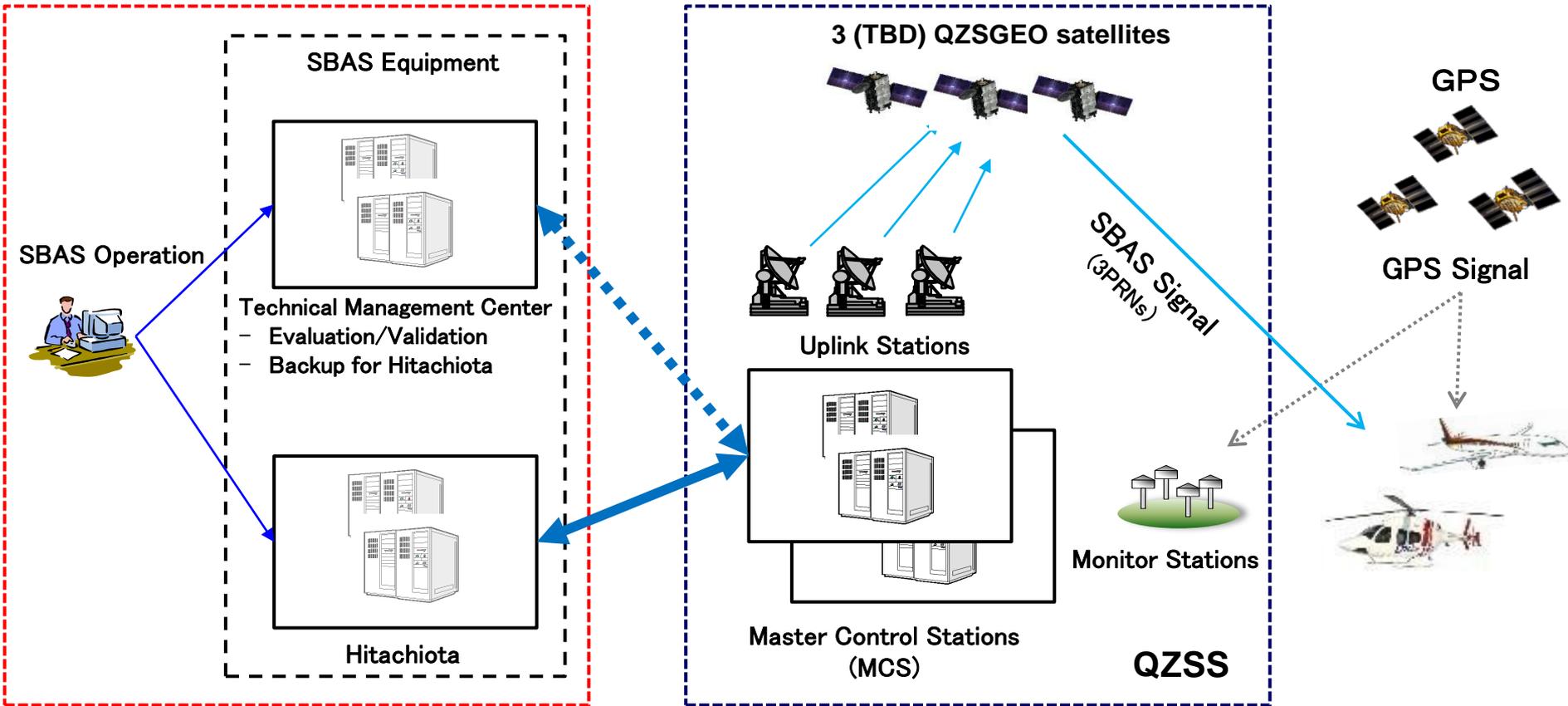




# MSAS System Diagram with QZSS (After 2020)



# MSAS Configuration (After 2023 TBD)



**JCAB**

**CAO**

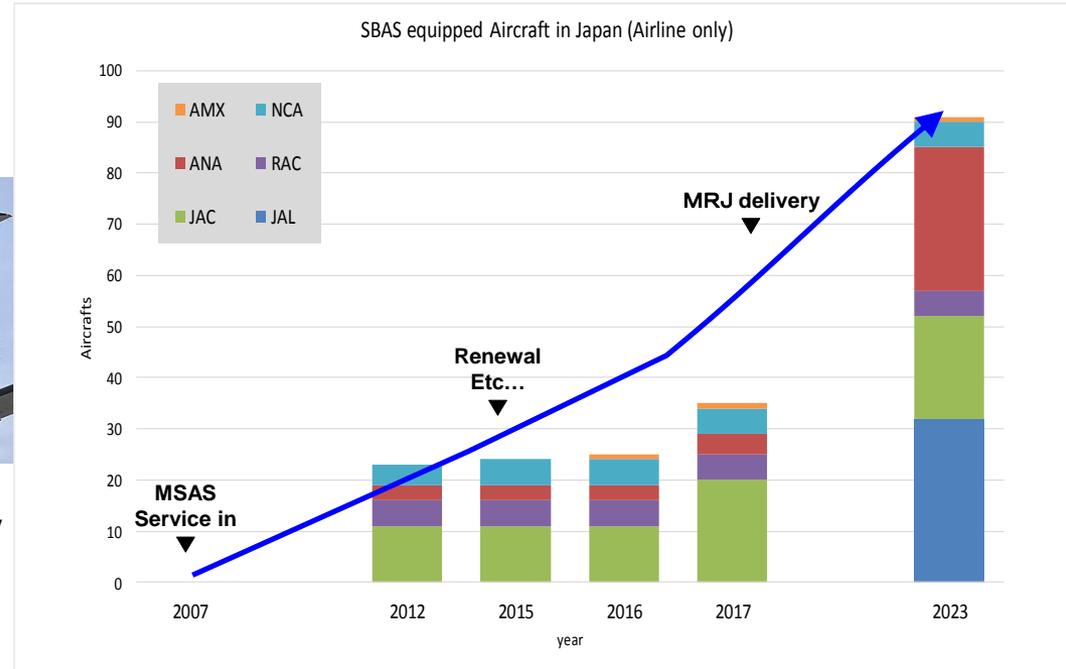
**Under planning**

# MSAS users have been increasing

## Regional Air carrier



Now, They are interested in LPV



## Other users



## Medical



**Private  
 Business  
 Etc...**



# Japanese aircraft with SBAS capability

- Mitsubishi Regional Jet (MRJ) 70-90 seat
  - ✓ Now, Flight test and evaluation
    - First delivery of MRJ is planned in 2017.
- Rockwell Collins Pro Line Fusion has a LPV capability
- Purchase Agreement with
  - ANA 25 aircraft, Trans States Holdings 100 aircraft,
  - SkyWest 200 aircraft,
  - Eastern Air Lines Group 40 aircraft,
  - Air Mandalay Limited 10 aircraft,
  - And JAL 32 aircraft,
  - Aerolease Aviation LLC 20 aircraft,





**Thank you for your attention.**