

# RAIM Prediction Website in Japan

The 15<sup>th</sup> Meeting of the APEC GNSS Implementation Team (GIT/15)  
June 13 – 17, 2011, at Brisbane, Australia

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# Provision of “RAIM prediction” in Japan

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## Current Status

- Since September 2007, The MSV (MSAS Service Volume) System has been in operational to support GNSS and MSAS operation in Japan.
- The MSV predicts RAIM availability and NOTAM information will be provided if RAIM outage is detected.

# Provision of “RAIM prediction” in Japan

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## Improvement of MSV

- Improvement of MSV to provide RAIM prediction results by Web site has been completed.
- From 1500UTC 29 June 2011(0000JST 30 June), “RAIM prediction” will be provided by;
  - NOTAM,  
and
  - Web site via internet
- GPS RAIM Prediction Japan Web site is in trial operation from 1500UTC 04 May 2011 to 1500UTC 29 June 2011

# RAIM prediction

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## RAIM prediction

- Scheduled prediction
  - Daily predictions by 1500UTC for 72 hours prediction window
  - Unable time period of RAIM function is predicted for more than 5 min, then the time period will be provided
- Special prediction
  - Special prediction is conducted (Ex; change of the status of GPS satellite)
- RAIM availability information for the followings are provided.
  - Approach  
approach procedure designated for RNAV operation
  - Terminal  
SID/STAR/Transition route for RNAV operation
  - En-route  
en-route for RNAV operation in Fukuoka FIR

# RAIM prediction NOTAM

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## Assumptions for RAIM prediction NOTAM

- SA (Selective Availability) ON
- Without Baro-Aiding
- Mask angle 5 degree
- FD function

## Example

(B0207/11 NOTAMR B0198/11

Q) RJTT/QGAXX/I/NBO/A/000/999/4146N 14049E005

A) RJCH B) 1104011452 C) 1104041500

E) GPS RAIM OUTAGES PREDICTED FOR APCH AS FLW

1104011810/1104011820

1104020005/110411820

- Valid period (prediction period)  
From 1452UTC 01 APR 2011 to 1500UTC 04 APR 2011
- Contents;  
Time period of RAIM outage for the GPS equipment on approach is predicted as follows.  
From 1810UTC to 1820UTC 01 APR 2011 and  
From 0005UTC to 1820UTC 02 APR 2011

# RAIM prediction service on the internet

## Assumptions for RAIM prediction

- SA (Selective Availability): ON/OFF (selectable)
- With/Without Baro-Aiding (selectable)
- Mask angle: 2/5 degree (selectable)
- FD/FDE function (selectable)

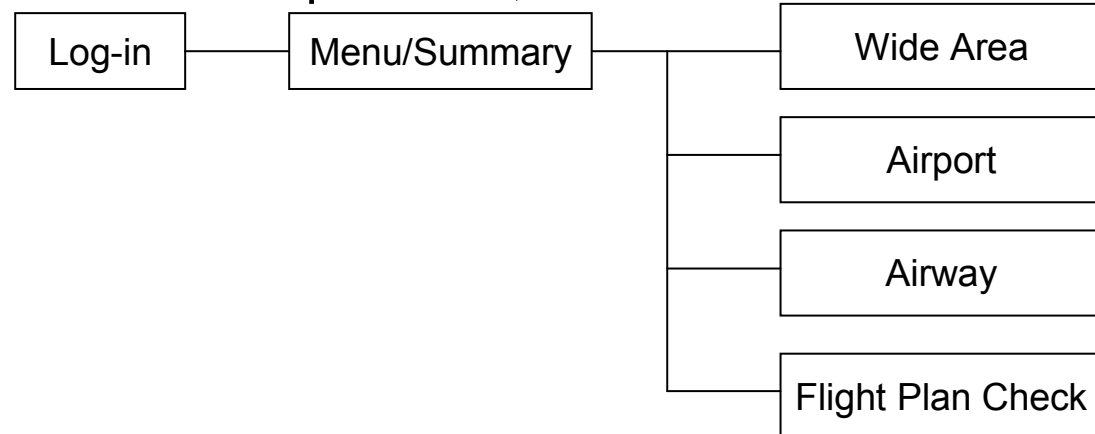
## How to access RAIM prediction

- Available after completing user registration

URL: <https://raim-japan.mlit.go.jp>

- The following display windows are provided;

- Menu/Summary
- Wide Area
- Airport
- Airway



# Information on RAIM Prediction Web site (1/2)

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## Menu/Summary window

- The following conditions are selectable by user
  - SA (Selective Availability): ON/OFF
  - Baro-Aiding: With/Without
  - Mask angle: 2/5 degree
  - Algorithm: FD or FED
  - Date
- Predicted RAIM availability will be displayed by graphical map
- Specific Outages are listed (location and time period)
- The detail display window are displayed when menu was selected

## Wide Area window

- RAIM prediction results are shown on graphical map for En-route, Terminal, and NPA

# Information on RAIM Prediction Web site (2/2)

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## Airway window

- Display alert information for selected airway by time bar chart

## Airport window

- Display alert information for selected airport by time bar chart

## Flight Plan Check window

- Display alert information for user entered flight plan by time bar chart
- Move detail information window (Airway/Airport window) when user clicked specific alert.
- Flight plan (full text) can be entered, then system will extract RNAV routes automatically to check RAIM outage

# Log-in window

https://raim-japan.mlit.go.jp



# Menu/Summary window

**Select date**

**Airway  
Airport  
name  
ON/OFF**

**Scale**

**Select mode**

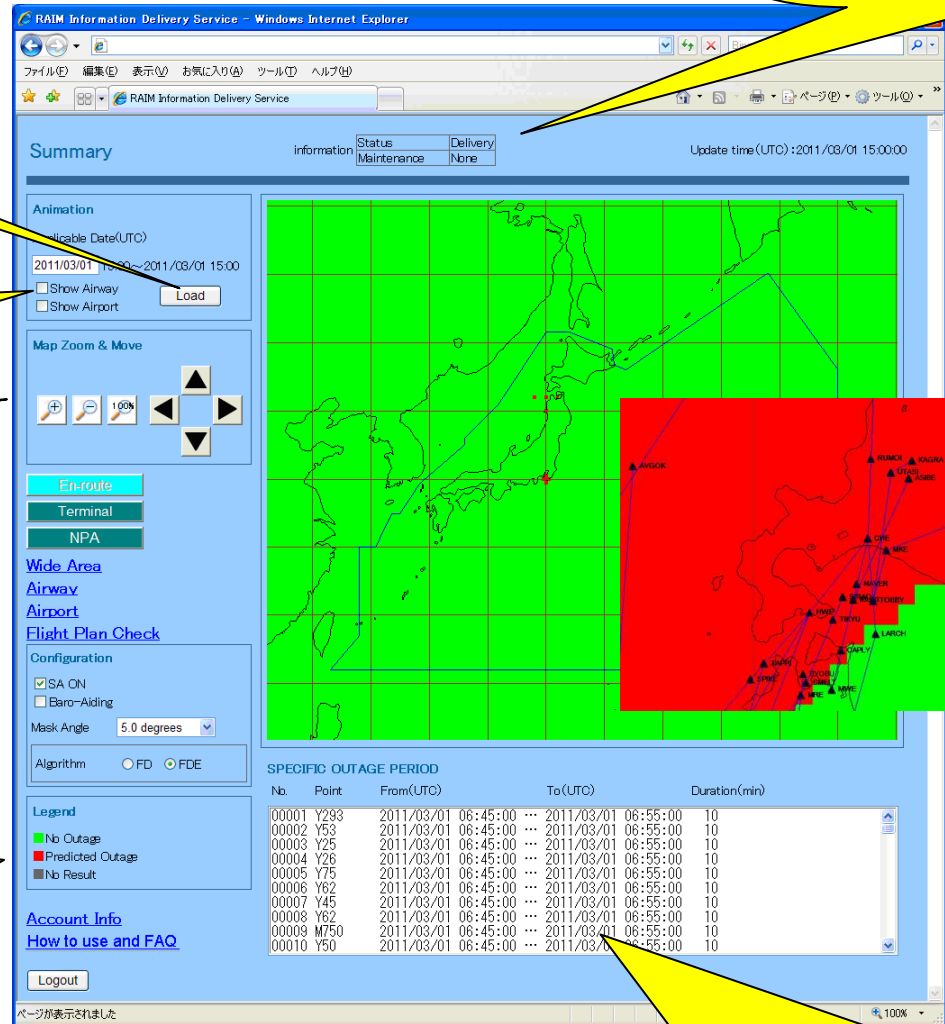
**Options**

**Configuration:  
w/wo Baro  
Mask Angle  
FD/FDE**

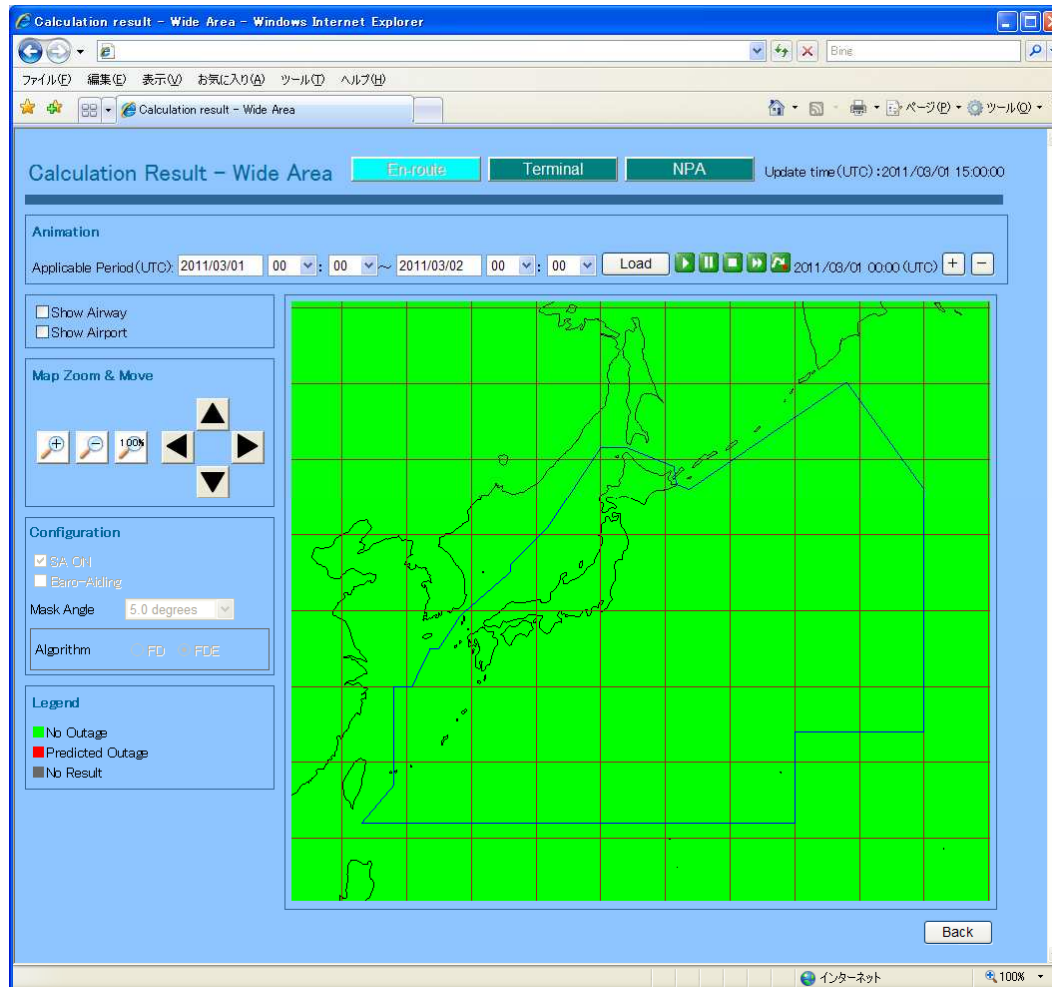
**System status.  
Maintenance/Periodical Prediction/  
Manual prediction/ etc.**

**Airway/Airport name is  
shown in detail window.  
Text color changes  
depends on the alert.  
In scale 800%**

**Airway/Airport under RAIM outage will be shown here.  
By clicking, more detail will be shown.**



# Wide Area window



Resolution 0.25 degrees.  
Valid range includes  
Fukuoka FIR and is wider by  
5 degrees in latitude and  
longitude.

# Airport window

**Calculation Result - Airport** Update time (UTC) : 2011/03/01 00:00

**Configuration**

- SA ON
- Baro-Aiding
- Mask Angle: 5.0 degrees
- Algorithm:  FD  FDE

**RAIM Prediction Result**

- Airport ID/Name: RAJT/TOKYO INTERNATIONAL ARP
- Executed Time Stamp(UTC): 2011/03/01 00:00
- Prediction Condition: 2011/03/01 00:00:00 ~ 2011/03/02 00:00:00
- Applicable Period(UTC): 2011/03/01 00:00:00 ~ 2011/03/02 00:00:00

**Terminal OUTAGE OVERVIEW**

Legend: No Outage Period (Green), Predicted Outage Period (Red), No Result (Grey)

**NPA OUTAGE OVERVIEW**

Legend: No Outage Period (Green), Predicted Outage Period (Red), No Result (Grey)

**Terminal SPECIFIC OUTAGE PERIOD**

| No.   | From(UTC)           | To(UTC)             | Duration(min) |
|-------|---------------------|---------------------|---------------|
| 00001 | 2011/03/01 00:00:00 | 2011/03/01 00:30:00 | 30            |
| 00002 | 2011/03/01 02:30:00 | 2011/03/01 04:00:00 | 90            |

**NPA SPECIFIC OUTAGE PERIOD**

| No.   | From(UTC)           | To(UTC)             | Duration(min) |
|-------|---------------------|---------------------|---------------|
| 00001 | 2011/03/01 01:20:00 | 2011/03/01 01:30:00 | 10            |
| 00002 | 2011/03/01 03:25:00 | 2011/03/01 03:35:00 | 10            |
| 00003 | 2011/03/01 03:50:00 | 2011/03/01 04:00:00 | 10            |
| 00004 | 2011/03/01 09:50:00 | 2011/03/01 10:30:00 | 40            |
| 00005 | 2011/03/01 11:30:00 | 2011/03/01 11:50:00 | 20            |

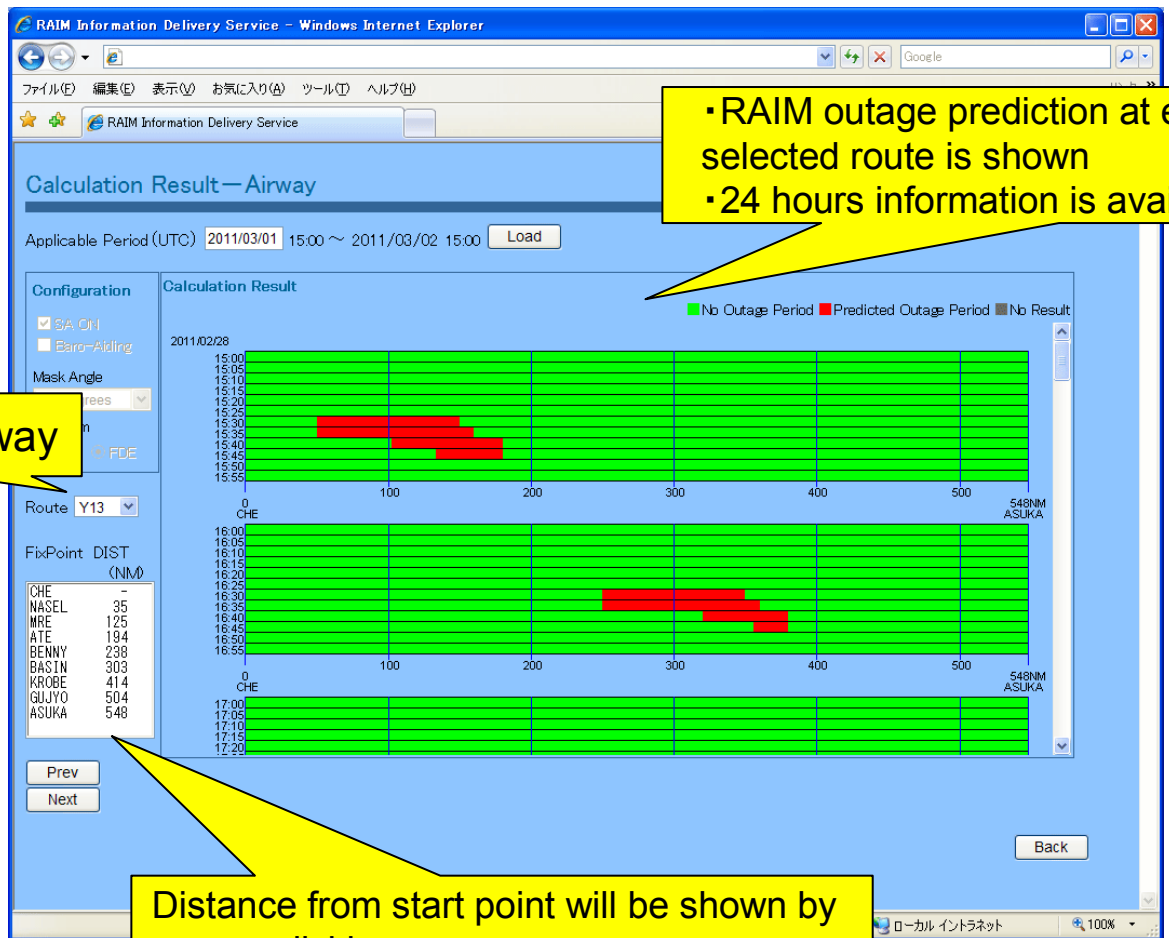
Buttons: Load, Back

Select airport

Update the last prediction

Show the RAIM outage information for Terminal area and NPA approach at the specified airport and time range above.

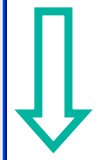
# Airway window



Select airway

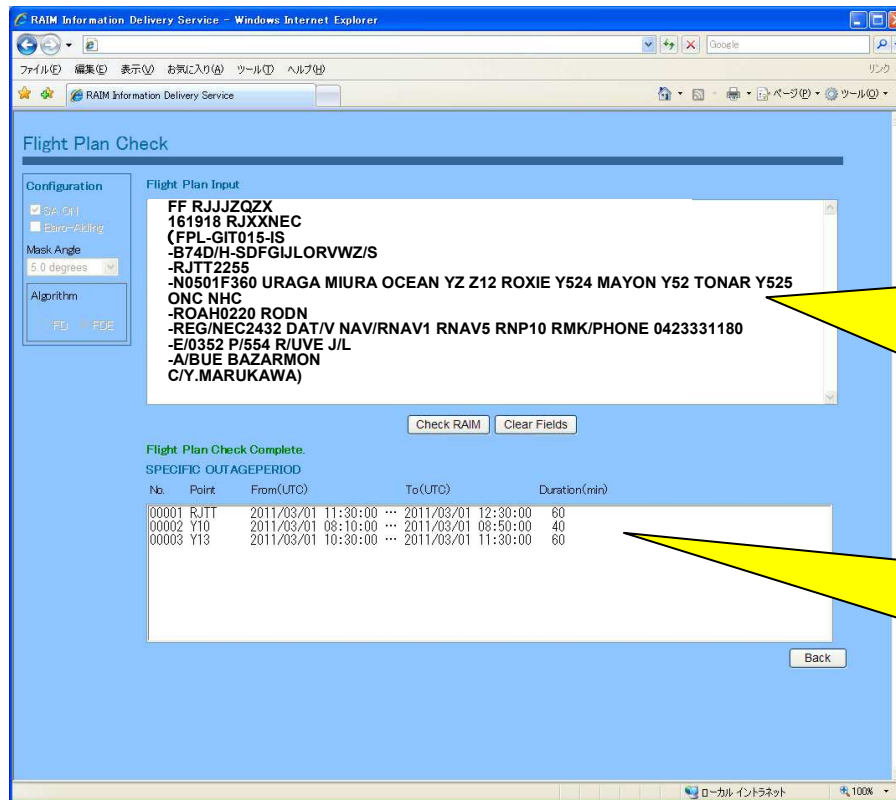
- RAIM outage prediction at every 5 minutes in the selected route is shown  
- 24 hours information is available in one screen.

Distance from start point will be shown by mouse clicking.



Up to 24 hours

# Flight Plan Check window



**Flight plan information**

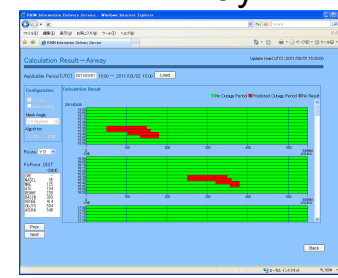
FF RJJJZQZX  
 161918 RJXXNEC  
 (FPL-GIT015-IS  
 -B74D/H-SDFGIJLORVWZ/S  
 -RJTT2255  
 -N0501F360 URAGA MIURA OCEAN YZ Z12 ROXIE  
 Y524 MAYON Y52 TONAR Y525  
 ONC NHC  
 -ROAH0220 RODN  
 -REG/NEC2432 DAT/V NAV/RNAV1 RNAV5 RNP10  
 RMK/PHONE 0423331180  
 -E/0352 P/554 R/UYE J/L  
 -A/BUE BAZARMON  
 C/Y.MARUKAWA)

Use flight path  
 (Dep AP – Airway – Arr AP)

**RAIM Outage summary list**

Display RAIM outage summary list for entered flight routes. When list is clicked by mouse, detail information screen (Airway, Airport) will be displayed

Airway



Airport

