# *Update on National Space Policy Development of JAPAN and Space Security*

**17th January, 2012**

**Secretariat of Strategic Headquarters for Space Policy,**
**Cabinet Secretariat**

# *Content of presentation*

*1 Organization chart*

*2 Basic Plan for Space Policy*

*3 Promotion of QZSS program*

*4 Reorganization of Governmental Framework for Space Policy in JAPAN*

*5 Space Security*

# *Japanese Basic Space Law (2008)*

## *Basic Concepts & Measures*

1. *Peaceful Use of Space*
2. *Contribution to Safety of Life*
3. *Promotion of International Cooperation*
4. *Promotion of Space Industries*
4. *Research and Development*
6. *Contribution to Environment*

## *Establishment of Headquarters for Space Policy*

## *Issuing Space Basic Plan*

# 1 Organization chart （Space related ministries in Japan）

**Strategic Headquarters for Space Policy, Cabinet Secretariat**

- Cabinet Intelligence and Research Office
- Cabinet Satellite Intelligence Center
- Cabinet Office
- Ministry of Internal Affairs and Communications (MIC)
- National Institute of Information and Communications Technology (NICT)
- Ministry of Foreign Affairs (MOFA)
- Ministry of Education, Culture, Sports, Science and Technology (MEXT)
- Japan Aerospace Exploration Agency (JAXA)
- Ministry of Agriculture, Forestry and Fisheries (MAFF)
- Ministry of Economy, Trade and Industry (METI)
- Institute for Unmanned Space Experiment Free Flyer (USEF), etc
- Ministry of Land, Infra-structure, Transport and Tourism (MLIT)
- Japan Meteorological Agency (JMA)
- Ministry of the Environment (MOE)
- Ministry of Defense (MOD)
- National Police Agency (NPA)

**etc. (all ministries and agencies)**

# 1 Organization chart （Space related organization）

## Strategic Headquarters for Space Policy

**Mr. Yoshihiko NODA**
Prime Minister
Chair

**Mr. Osamu FUJIMURA**
Chief Cabinet Secretary
Vice-Chair

**Mr. Motohisa FURUKAWA**
Minister for Space Policy
Vice-Chair

***※ All the ministers constitute the member of the Headquarters.***

**Special Committee on Space Policy**

- **Working Group for** Quasi-- Zenith Satellite System
- **Working Group for** Examination of Remote Sensing Policy
- **Working Group for** Restructuring of Space Related Organizations
- **Working Group for** Legislation on Space Related Activities

**Parliamentary secretaries Project Team Related to QZSS**

**Cabinet Secretariat Strategic Headquarters for Space Policy**

# 2 Basic Plan for Space Policy

**The government settled on “Basic Plan for Space Policy” based on Basic Space Law in Jun.2009.**

**6 Basic Pillars**

**5 Systems and 4 Programs**

# Six Basic Pillars of the Utilization and R&D of Space(1,2)

***Six Basic Pillars***

***1: For a Rich, Secure and Safe Life***

- Promote utilization and R&D of Space to deal with various needs of our society, such as ;
  - Public Safety, Preservation and Care of the territorial land,
  - Smooth Supply of Food, National Resources and Energy
  - Resolution of global problems (realizing a low carbon society)
  - better quality of life (high spec. positioning system, etc.)
  - continuous growth of industry and creation of employment

***2: Security through the Utilization of Space***

- Security through the utilization of Space, while maintaining our exclusively defense-oriented policy

# Six Basic Pillars of the Utilization and R&D of Space(3)

***3: Space Diplomacy***

- "Utilization of Space for Diplomatic Policy"
  - Apply our space technology for protecting human beings from the threat of disaster, climate change, and others

- "Diplomatic Policy for space"
  - Make diplomatic efforts for establishing the appropriate rules in space activities, in accordance with space related Treaties

# Six Basic Pillars of the Utilization and R&D of Space(4)

**<*Six Basic Pillars* *of the Utilization and R&D of Space*>**

***4: Create an energetic future by promoting R&D of the forefront areas***

- Breakthrough for new technology and creation of an energetic future by leading-edge R&D such as
  - space science and manned space activity that expand the area where human beings can exist

-Utilizing proactively international cooperation

# Six Basic Pillars of the Utilization and R&D of Space(5,6)

**<Six Basic Pillars of the Utilization and R&D of Space>**

**5: Foster Strategic Industries for the 21st Century**

- The space industry is :
  - an important base that supports Space Activity of our country
  - so wide that it includes the utilization industry, and has a ripple effect to other industries

**6: Consider the Environment**

- The Government will take measures considering both the global and the space environment, such as space debris issue
- 2009,10 Japan submitted Japanese comment about “the EU’s draft Code of Conduct for outer space activities”

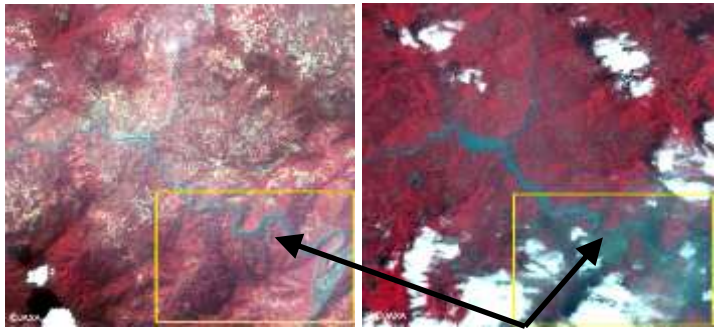
# A: Land and Ocean Observing Satellite System to contribute to Asia and other regions

***Sichuan earthquake (Chine)***

*The river was dammed up by the landslide and it became a dam lake.*

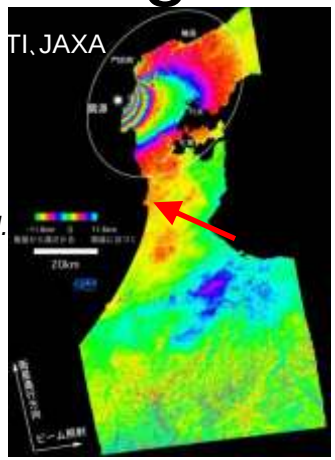
*→ dangerous of the flood in the downstream region*

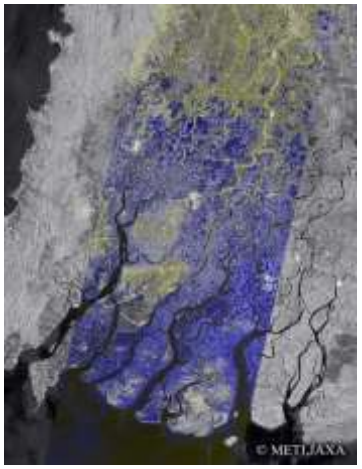
before → after



***FY19 Diastrophism of Noto Peninsula earthquake (Japan)***

*→ The upheaval of 45cm or less is detected.*

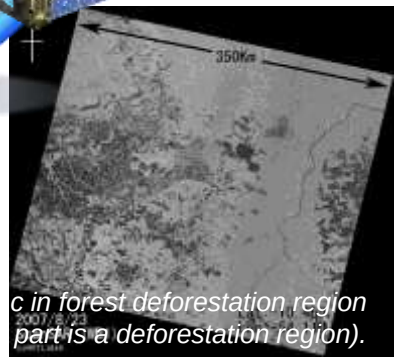



***Flood by Cyclone Nargis (Myanmar）***

*A blue part is a submerged land region.*

*An underground volume of water increases in a yellow part. Possibility that new flood occurs.*

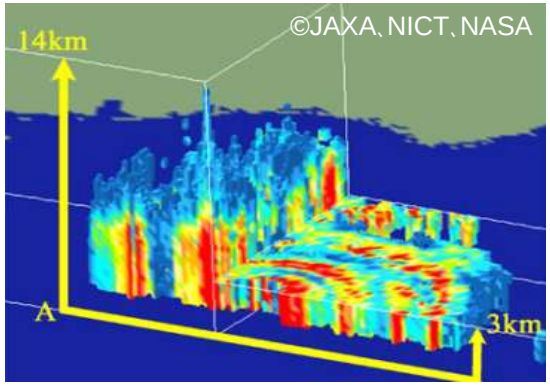


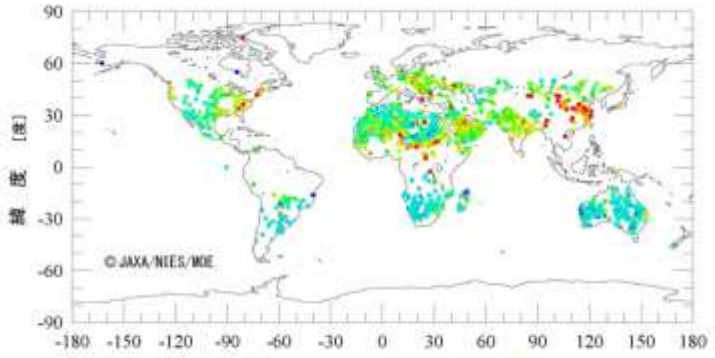

*c in forest deforestation region part is a deforestation region).*


*Situation of green space in Sakurajima (Japan) (2006)*

# B: Global Environmental Change and Climate Observing Satellite System

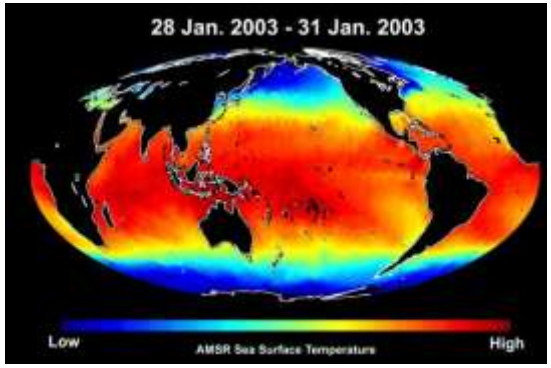
*Three-dimensional situation of rain of hurricane (Image by Japanese sensor (PR))*



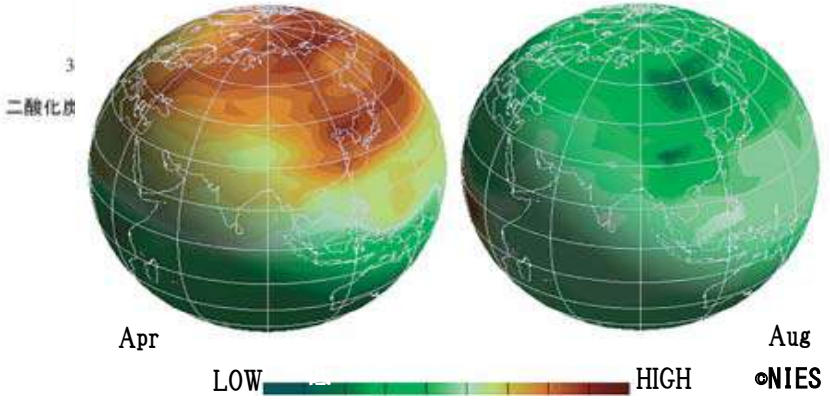




*Distribution of carbon dioxide (Image by Japanese satellite (GOSAT))*
*(Figure Left)*

*Density simulation result*
*(Figure below)*




*Temperature of sea surface*
*(Image by Japanese sensor (AMSR))*



# C: Advanced telecommunication Satellite System

***When damage occurs to the ground base station in a time of disaster***

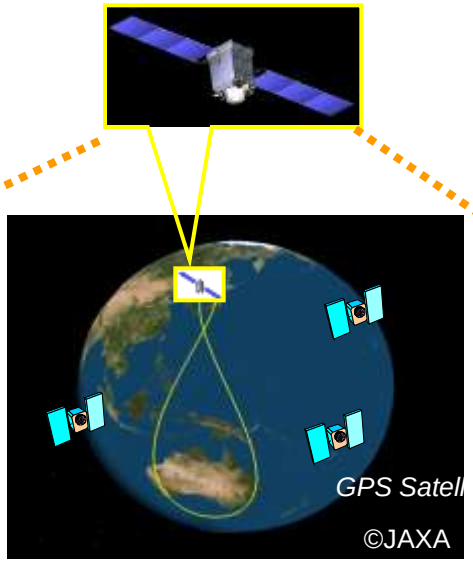
*Communications satellite*

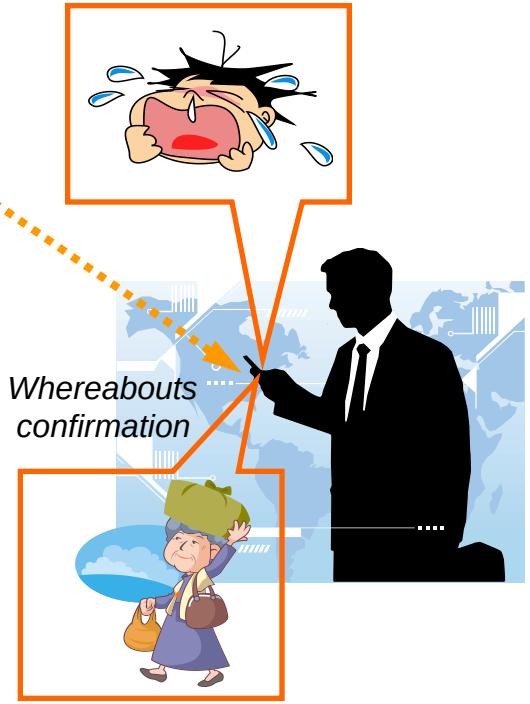

***communicate impossible***

# D: Positioning Satellite System

*Car navigation system*

*Quasi-Zenith*

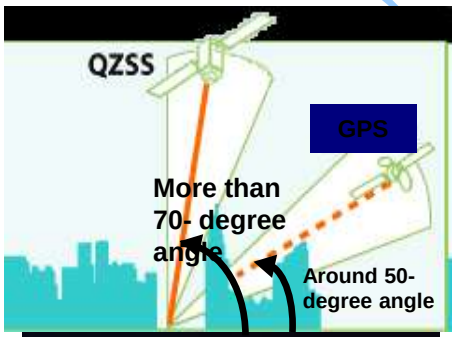


# Quasi Zenith Satellite System

## ***QZSS***

- Regional space based PNT system, augmentative to GPS
- Cover East Asia and Oceania region
- Interoperable and compatible with GPS




## ***Current Situation***

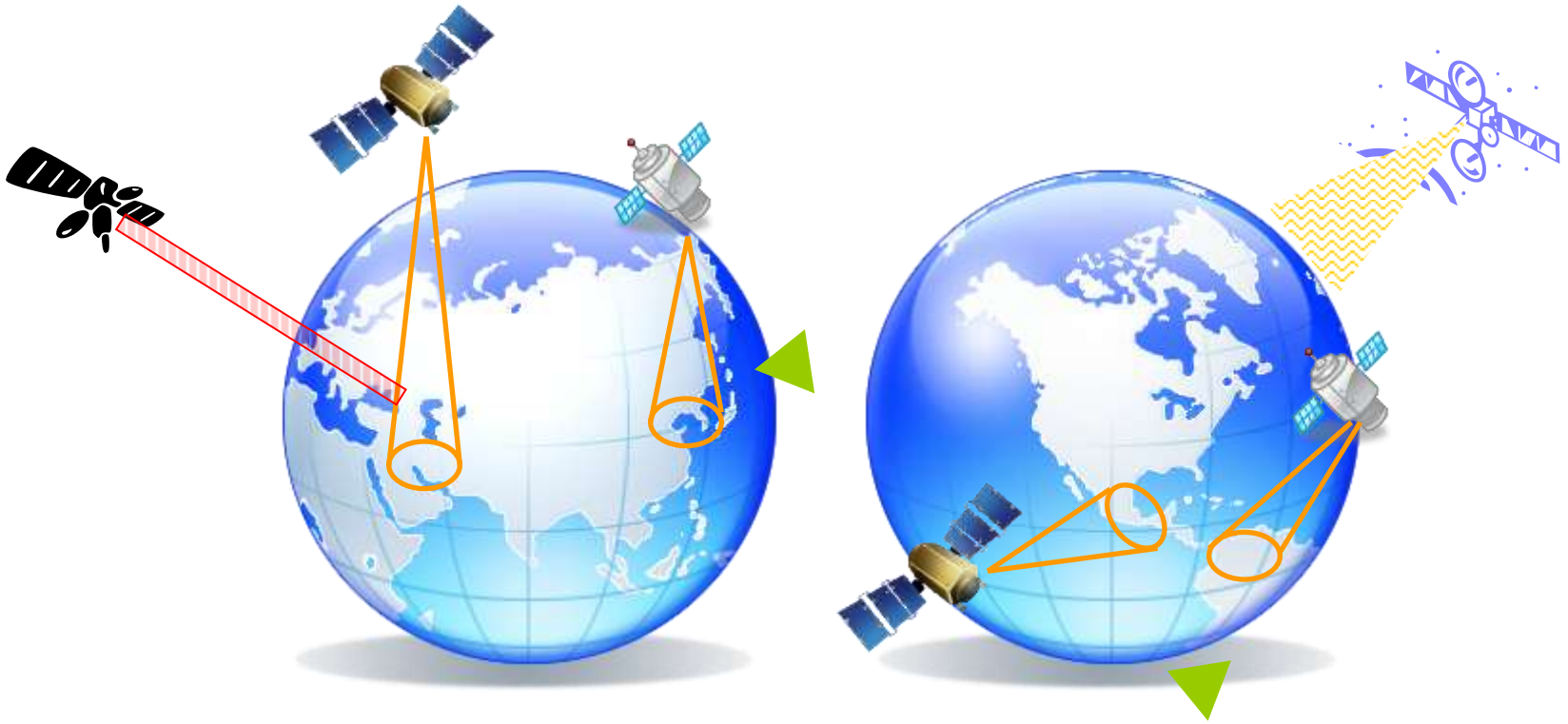
- The first satellite “Michibiki” successfully launched on 11.Sept.of 2010
- Conduct technical and utilization experiment

## ***Promotion of QZSS plan***

- Basic concept of promoting the practical QZSS program
- Establishment of a strategic promotion system for the development and utilization of outer space
- approved at the Cabinet meeting on September 30, 2011

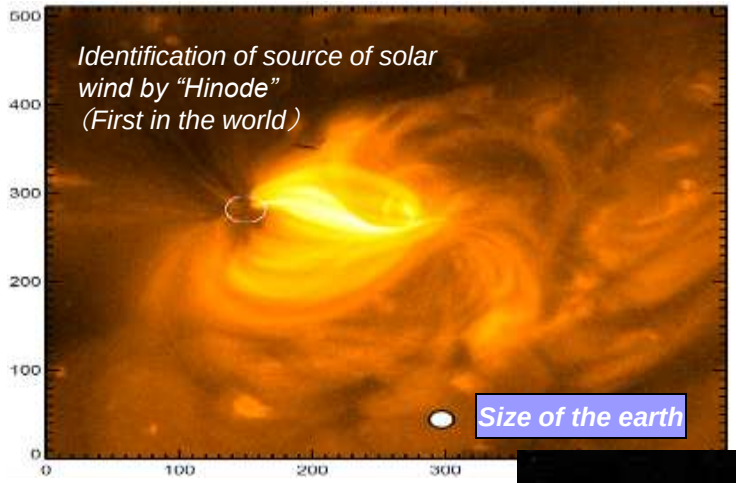
***QZSS Orbit***

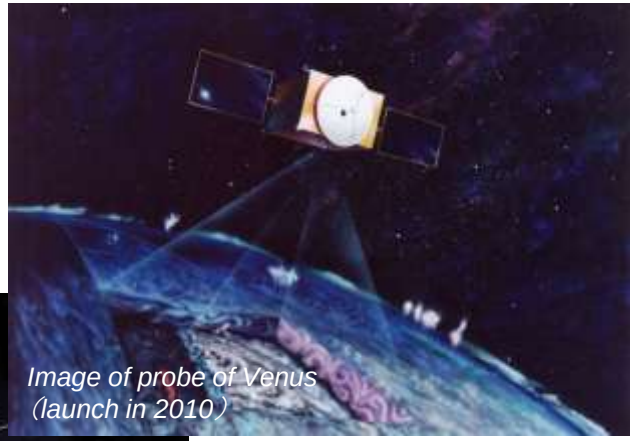
# E: Satellite System for National Security



Information Gathering Satellites

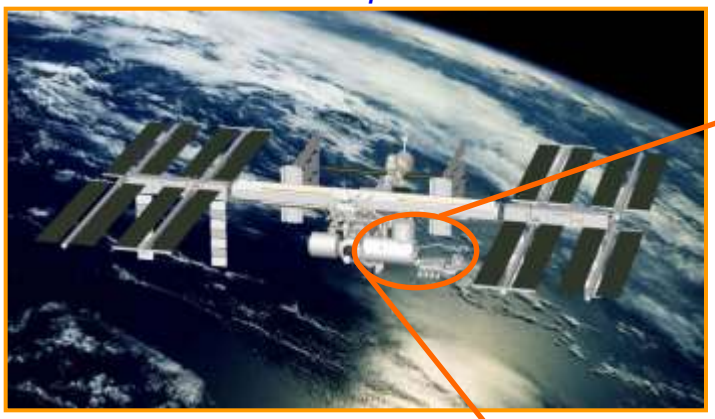
# F: Space Science Program




# G: Human Space Activity Program

*International Space Station*



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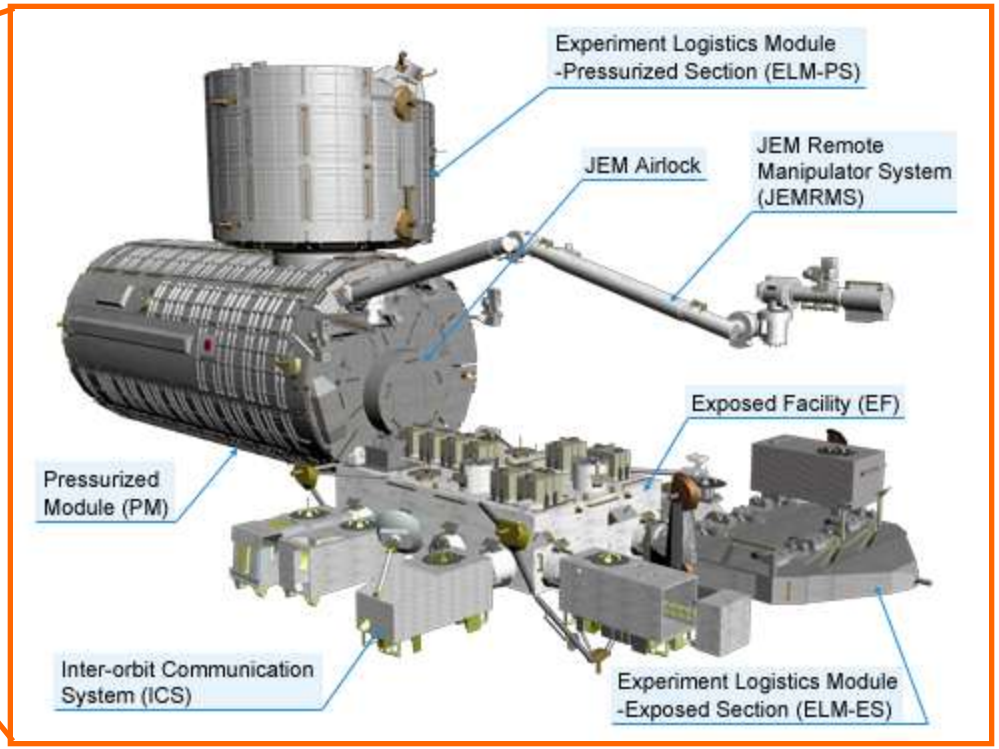
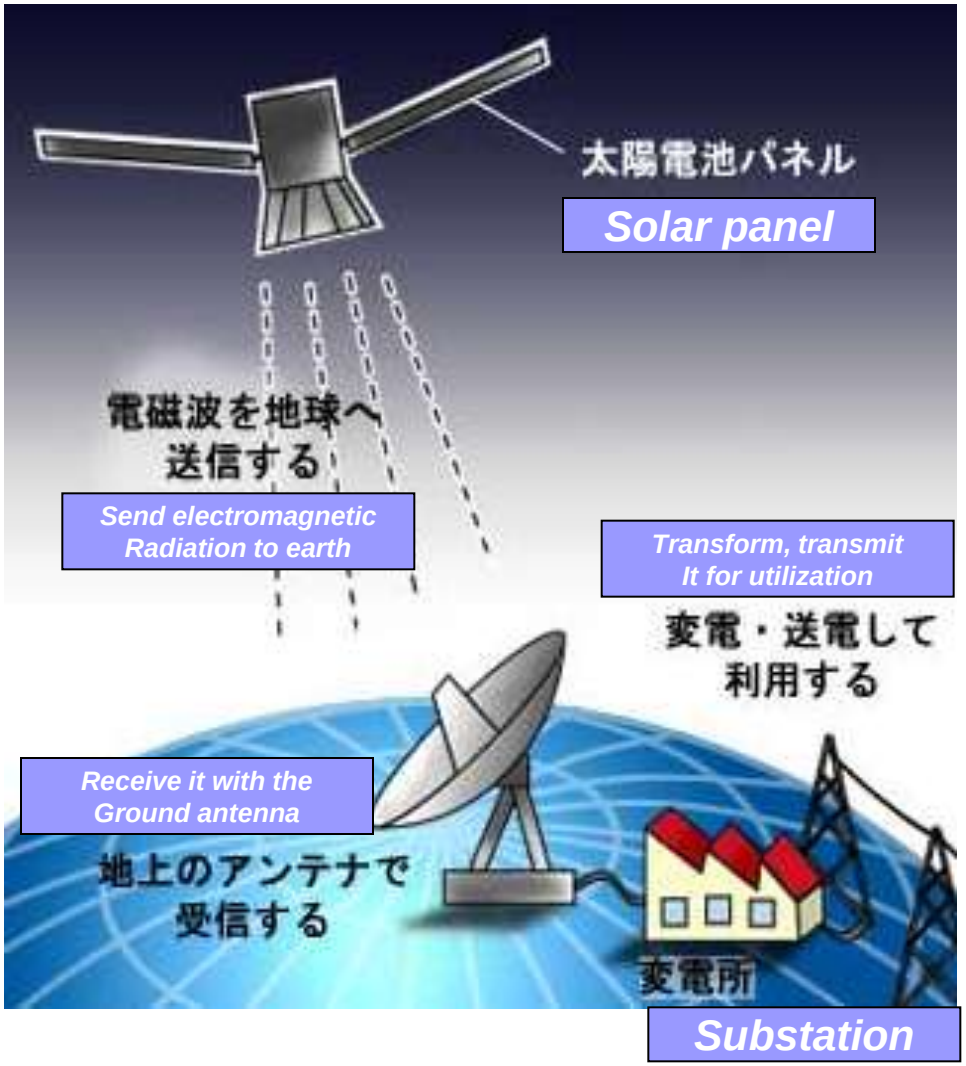
*Japanese Experiment Module (Kibo)*

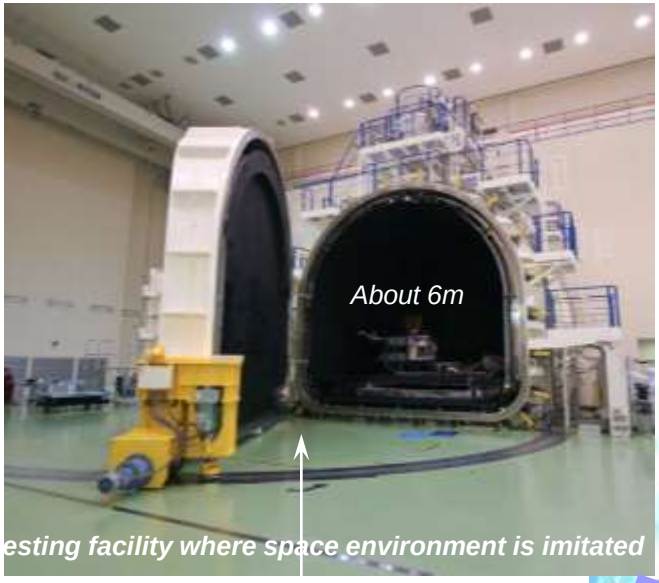



- In principal, Japan will continue to participate in the ISS Program in and after 2016, taking necessary actions such as coordination with other countries, and taking impact of industrial promotion into account.

# H: Space Solar Power Program



# I : Small Demonstration Satellite Program





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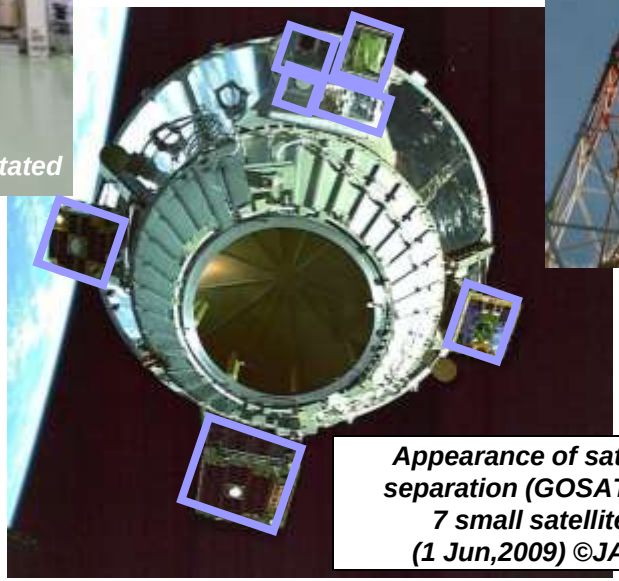

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Appearance of satellite separation (GOSAT) and 7 small satellites (1 Jun,2009) ©JAXA

# Promote Measures under the Basic Plan for Space Policy

***(1) Structure to promote measures based on the Basic Plan***

***(2) Ensuring the necessary budget and personnel for the execution of the measures***

***(3) Follow-up and announcement of how far the measures are executed***

***(4) Strengthening the investigation and analysis function of international trends***

***(5) Establishment of legislation concerning Space Activity***

***(6) Ensuring the cooperation and correspondence with policies other than space***

# 3 Promotion of QZSS Program

< Basic concept of promoting the practical QZSS program>

approved at the Cabinet meeting on September 30, 2011.

The QZSS will contribute to

- Welfare of the Asia-Pacific region
- Strengthening the Japan-U.S. and Japan-EU partnership
- Broad range of security including the improvement the capacity to respond to natural disasters

# 3 Promotion of QZSS Program

< Basic concept of promoting the practical QZSS program>

approved at the Cabinet meeting on September 30, 2011.

- GOJ decides to accelerate the deployment of the operatinal QZSS as expeditiously as possible.
- Four satellites constellation will be established by the late 2010s.
- In the future, seven satellites constellation will be achieved to enable sustainable positioning.

# 3 Promotion of QZSS Program

< Basic concept of promoting the practical QZSS program>

approved at the Cabinet meeting on September 30, 2011.

- The Cabinet Office shall develop, deploy and operate the operational QZSS, based on the achievement of the first QZSS satellite (named “Michibiki”), and shall submit a budget request to cover relevant cost.

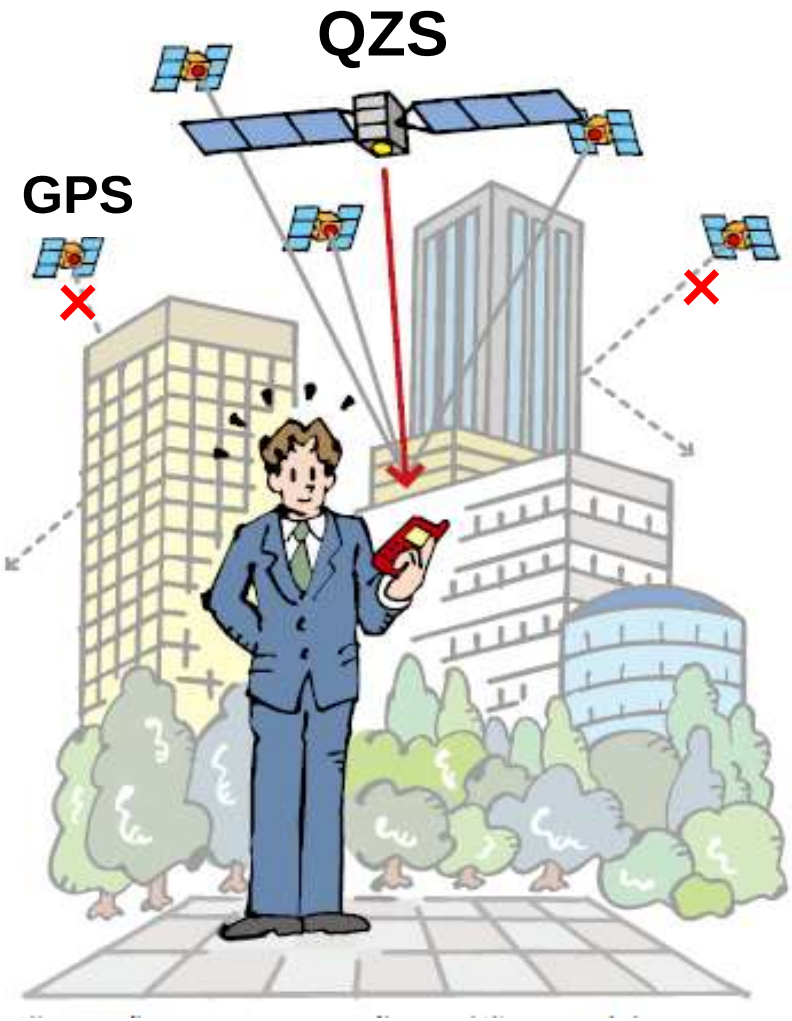
- Legal amendments shall be made in order for the Cabinet Office to fulfill such a role in time for budget implementation（FY2012 Budget：10 Billion YEN（100 Million Euro）as the Cabinet decision） .

## *QZSS Functional Capability 1*

# *GPS Complementary*

**QZSS improves positioning availability time**

Complementary signals sent from high elevation will improve the time percentage of positioning availability from 90 % (GPS only) to 99.8 % * (GPS + QZSS.)




* The time percentage that the position dilution of precision (PDOP) is less than 6 when a satellite whose elevation angle is 20 degrees or over is used for positioning calculation.

## QZSS Functional Capability 2

# GPS Reinforcement

**QZSS improves positioning accuracy**

QZSS upgrades the positioning accuracy to a sub-meter or several centimeter level.

**Augmentation Data**
- Acquisition Support Data
- Correction Data
- Integrity Data

**QZS**

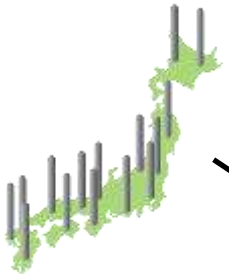
**Navigation Signal**

GPS Galileo GLONASS

**Navigation Signal and Augmentation Data**

L1-SAIF (250 bps)
LEX (2000 bps)

**Ground Segment**



Master Control Station

GPS Earth Observation Network

Augmentation Data Generation

Global Monitoring Stations

**User Segment**

LEX — L1-SAIF

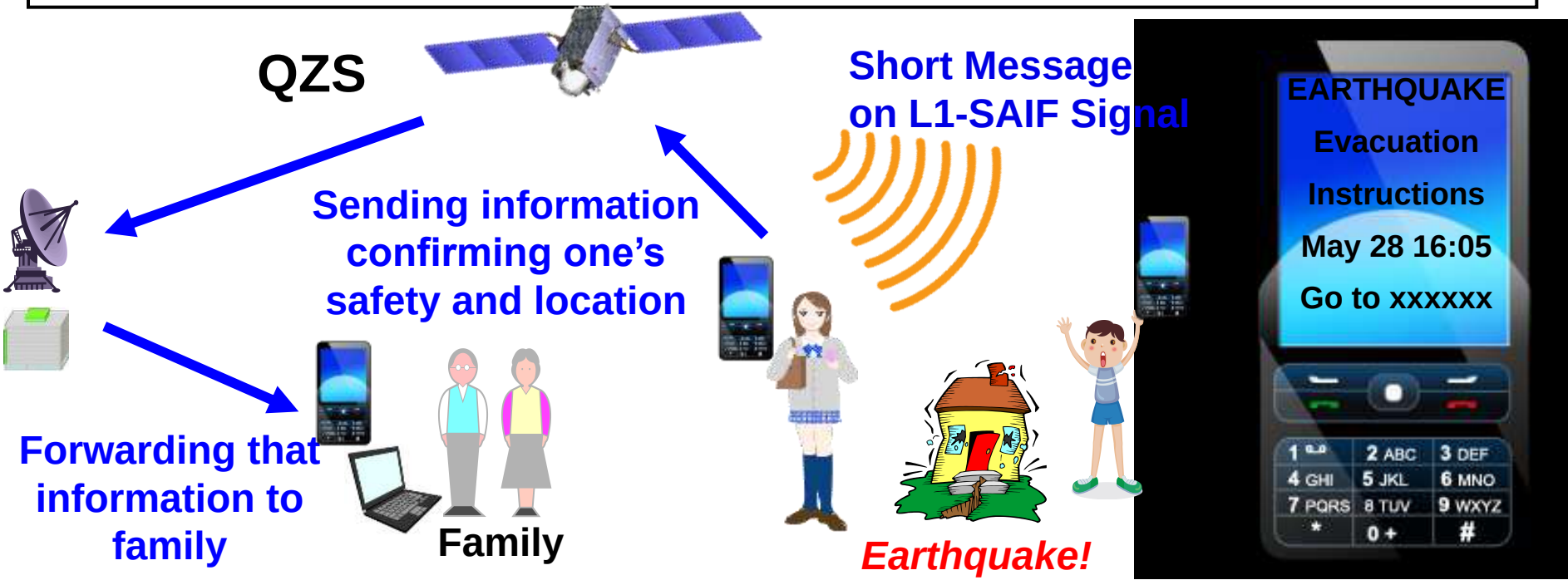
centimeter (accuracy ) sub-meter

## *QZSS Functional Capability 3*

# *Short Message and Collection of Information*

**QZSS can send short messages and gather information**

- QZSS can send short messages such as emergency warnings simultaneously to everyone with a mobile phone.
- We are planning to equip the future QZSS satellites with an information gathering function which will enable people to send information confirming their safety during a crisis or disaster.



# 3 *Reorganization of Governmental Framework for Space Policy in JAPAN*

< Reorganization of Governmental Framework for Strategic Promotion of the Development and Utilization of Outer Space>
approved at the Cabinet meeting on September 30, 2011.

- The Cabinet Office shall play commanding function for space policy in Japan.
- Strengthening of commanding and coordinating function for space policy in Japan.
- The Cabinet office shall also be in charge of the specific implementing project such as QZSS
- The Cabinet office shall have the specific space strategy department（tentative） and the advisory committee for space policy

Submit the legal amendment to forthcoming ordinary Diet session from January of 2012.

# 4 *Space Security*

- Japan's Basic Law on Space in 2008

- Emphasize the shift of space policy focus from science and technology to utilization of space for civil and security applications

- Japan's Basic Plan on Space at the Cabinet level

- State the importance of international cooperation for the Security of Space
- Space Situation Awareness is focused as an important subject to increase the government effort

- GOJ appreciate the EU initiative to draft a Code of conduct for outer space activities
- The international cooperation on Space Situation Awareness is very meaningful in the field of space activities
- Also the cooperation on the data sharing of Image from Remote Sensing and asset sharing are very important for broad range of security including natural disaster

# *Finally・・・*

- The Space Security is the crucial subjects for the prosperity of the peace of the world.

- GOJ is committed to work together with EU and international communities.

***Thank you***
***for your attention***