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

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
## Organization chart
(Space related ministries in Japan)

### Strategic Headquarters for Space Policy, Cabinet Secretariat

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

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
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)

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 (China)
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.

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))

©JAXA, NICT, NASA
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When damage occurs to the ground base station in a time of disaster
D: Positioning Satellite System

Car navigation system

Quasi-Zenith

Whereabouts confirmation

©JAXA
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
E: Satellite System for National Security

Information Gathering Satellites
F: Space Science Program

Identification of source of solar wind by “Hinode” (First in the world)

Image of sample collection by “Hayabusa”

Image of probe of Venus (launch in 2010)

Image of the size of the earth
- 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

Send electromagnetic Radiation to earth

Transform, transmit It for utilization

Receive it with the Ground antenna

Substation
I : Small Demonstration Satellite Program

Testing facility where space environment is imitated

About 6m

H-II A Rocket #15
Launching with seven small satellites

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 operational 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

**Navigation Signal**
- GPS
- Galileo
- GLONASS

**QZS**

**Ground Segment**
- Master Control Station
- GPS Earth Observation Network
- Augmentation Data Generation
- Global Monitoring Stations

**User Segment**
- L1-SAIF (250 bps)
- LEX (2000 bps)

**QZSS improves**

- Centimeter
- Sub-meter (accuracy)
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.

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**QZS**

- **Sending information confirming one’s safety and location**
  - **Forwarding that information to family**
  - **Short Message on L1-SAIF Signal**

**Earthquake!**

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**EARTHQUAKE Evacuation Instructions**
May 28 16:05
Go to xxxxxxx
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