

Recent Development of Space Technology in Vietnam

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**STRATEGY FOR RESEARCH AND APPLICATION
OF SPACE TECHNOLOGY OF VIETNAM
UNTIL 2020**

June 14th, 2006

Objectives of the strategy

1. To form the national policy and legal frame for research, application and international cooperation on space technology, human resource policies
2. To **build the initial infrastructure** for space technology
3. To plan and carry out a **national science-technology program** on space technology
4. To **master the manufacture technology** of ground station, the small satellite technology
5. To manufacture and launch some **earth observation small satellites**
6. To **apply the space science and technology**





VIETNAM NATIONAL SATELLITE CENTER

Functions and tasks

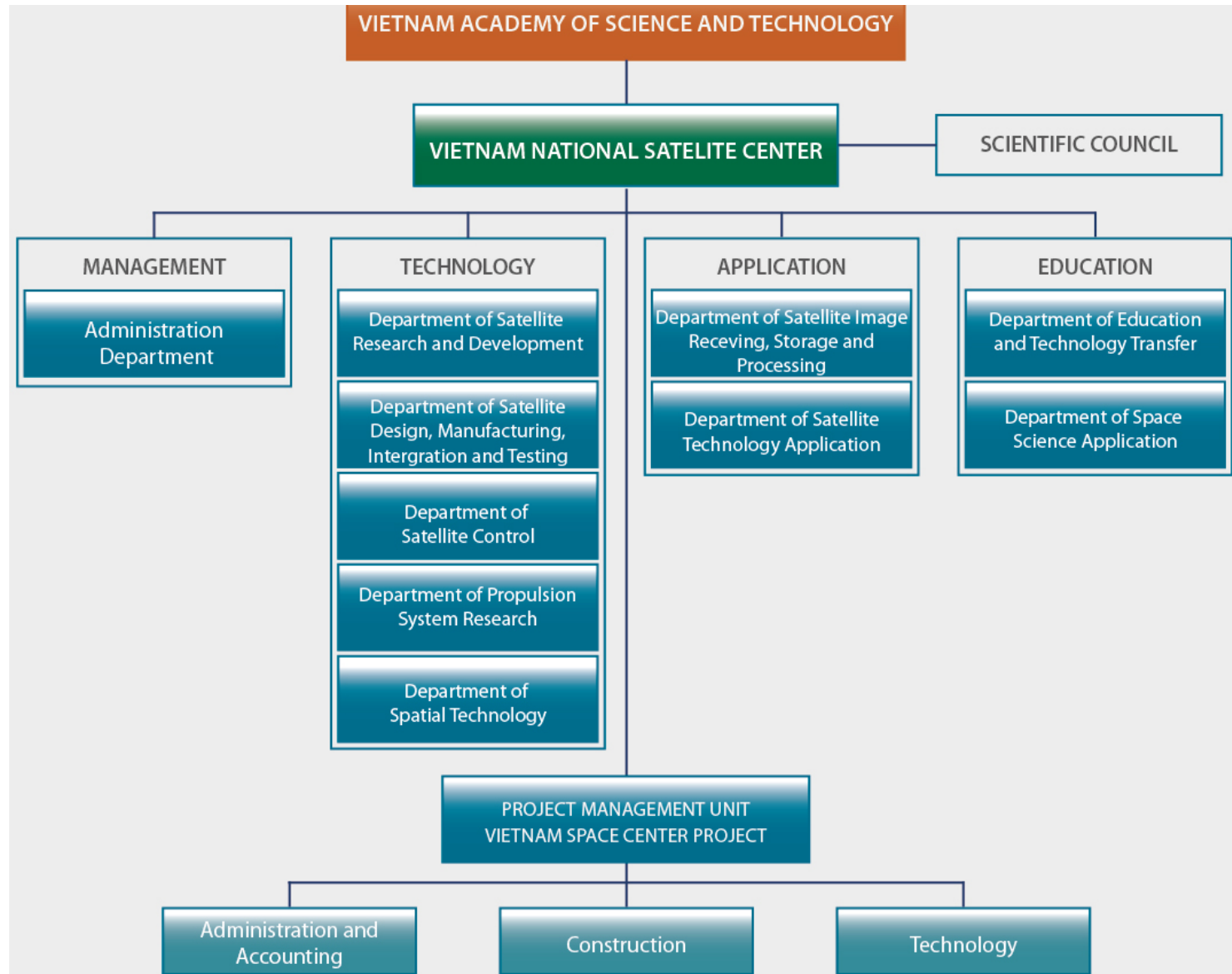
16/9/2011 VNSC was established by Decision No.1611/QĐ-TTg of the Prime Minister with the task:

❖ Research and development, applying and training in the field of satellite technology

- To implement **key national projects** in the research and development, applying and training in the field of satellite technology.
- The present task is **managing and implementing** the project for building the **Vietnam Space Center (VNSC)**
- To **research, design, manufacture, assembly and test** the small satellite;

Functions and tasks

- To collect data and process the satellite images in order to apply to the space technology;
- To educate and transfer the satellite technology.
- To develop and carry out the international co-operation project on the space technology, especially on the satellite technology;
- To build the Space Science Center to promote and improve people's knowledge about the importance and benefit of the space technology



- ❖ *Project:* Vietnam National Space Center
- ❖ *Place:* Hoa Lac Hi-tech Park
- ❖ *Area:* 09 ha
- ❖ *Duration:* 2012 - 2020
- ❖ *Capital:* 54.400 billion Yen
- ❖ *Owner:* Vietnam Academy of Science and Technology (VAST)
- ❖ *Executing Agency:* Vietnam National Satellite Center (VNSC)

The Project consists of **three** main components:

✓ **Satellite Technology**

- 02 SAR Observation Satellite

✓ **Facility**

- Assembling, integration & test facility
- Data image receiving and processing facility
- Research and education facility

✓ **Capacity Development**

- Small satellite development
- Remote sensing technology

□ SAR Observation Satellite

Mass: 500kg

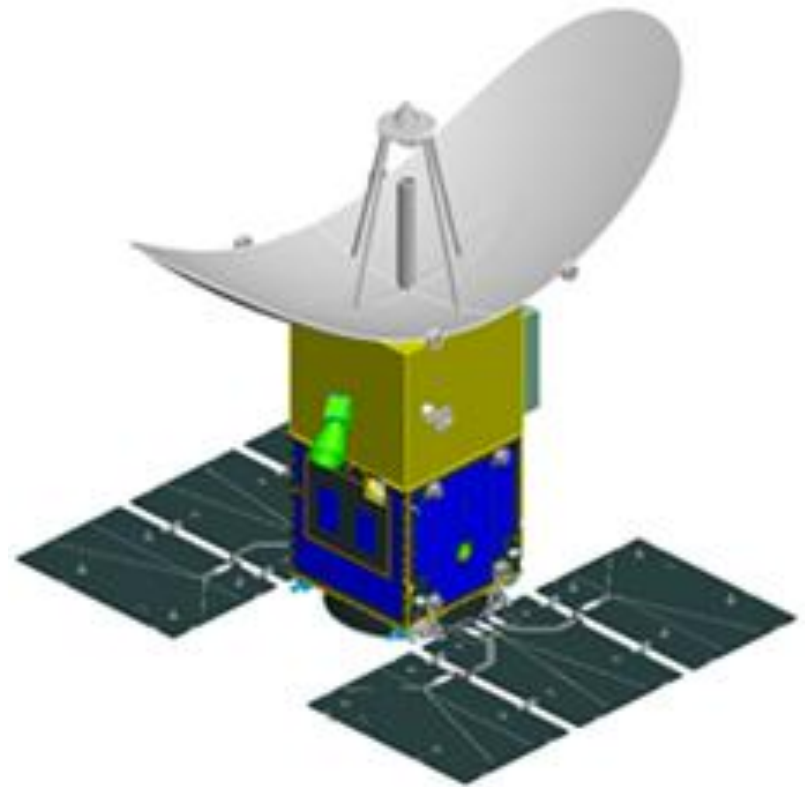
Life: 5 years

Size: Approx. 2.6m x 3.5m x 3m

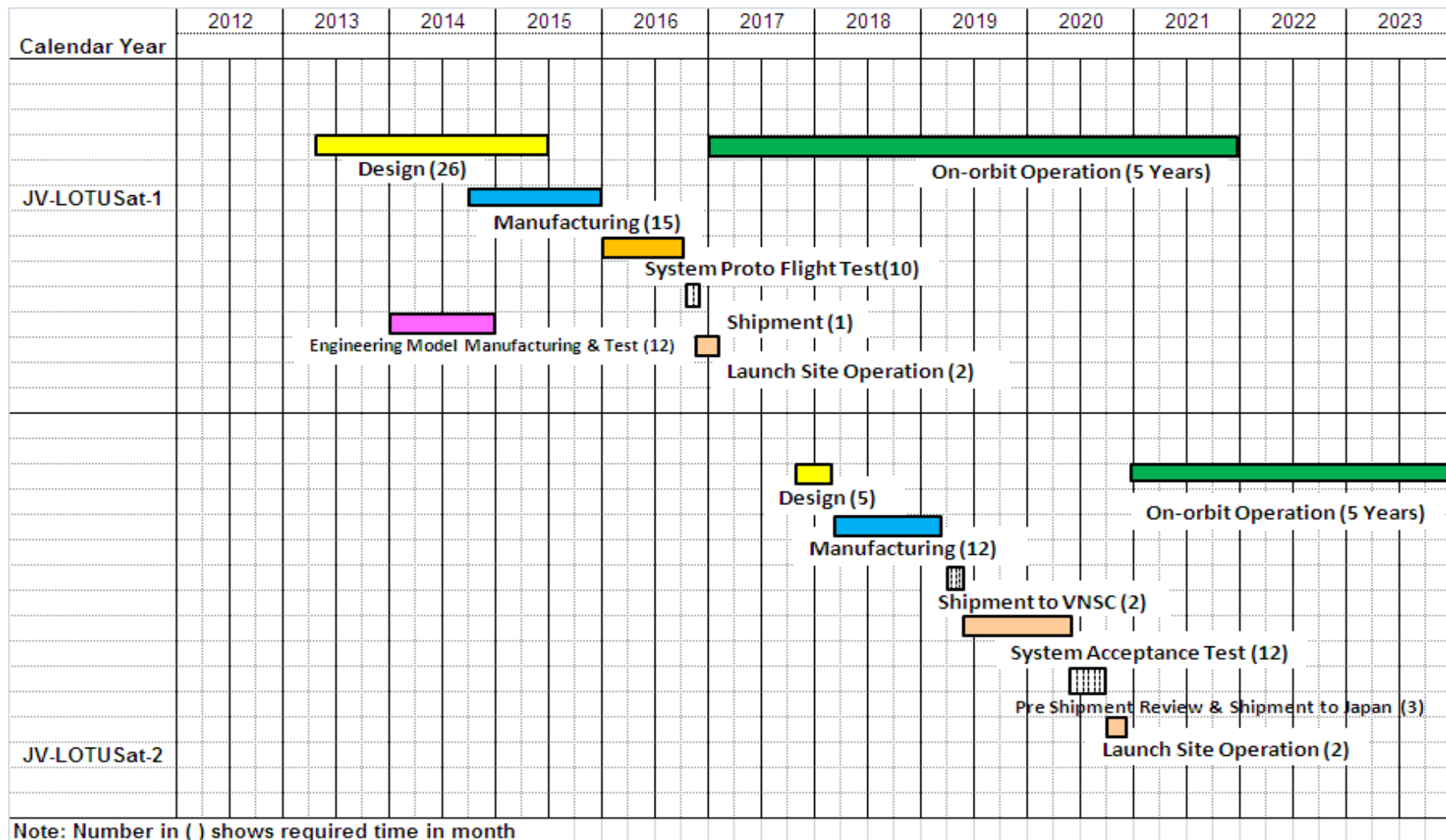
<Mission>

X-band SAR sensor

Spatial resolution ~ 1.0m



JV-LOTUSat Development Schedule



VIETNAM SPACE CENTER PROJECT

FACILITY



VIETNAM SPACE CENTER PROJECT

EQUIPMENT



Data Receive & Archive Equipment



Antenna 7m



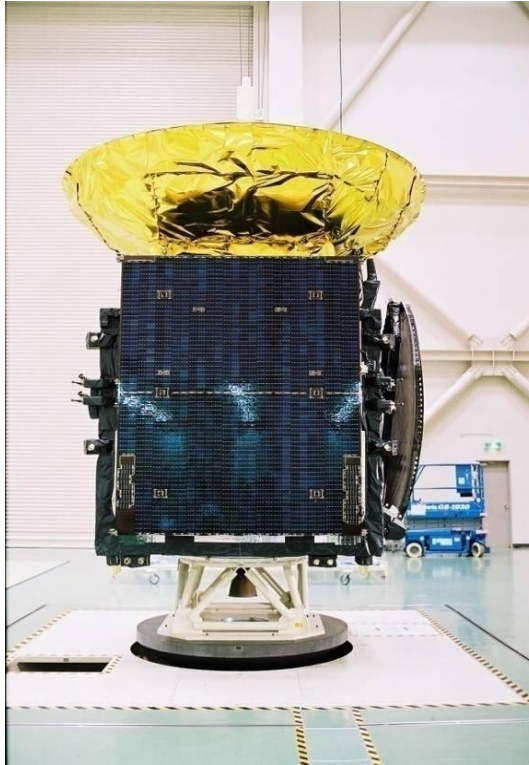
Satellite Operation Equipment



Data Archive & processing center



Thermal vacuum Test Facility



Satellite Integration
Facility



Electromagnetic Test Facility



Vibration Test Facility



Satellite Operation Center

The objects of capacity development are staff working for VNSC who are in charge of:

- Overall management of VNSC: 18 staffs
- Satellite production and operation: 36 engineers
- Satellite data utilization: 30 engineers

VNREDSAT

Project Owner: Vietnam Academy of Science and Technology
Small Satellite Project Management Unit

Implementation period: 2010 – 2014

Finance source: French ODA

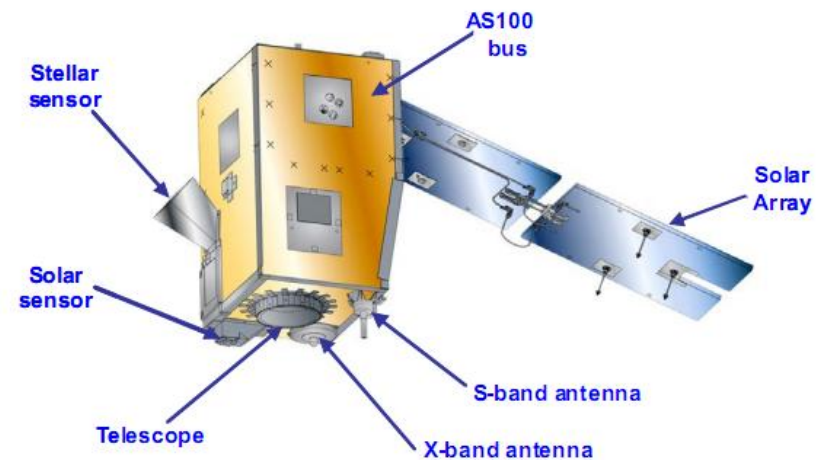
Fund: 55,8 million Euro

Prime contractor: EADS Astrium

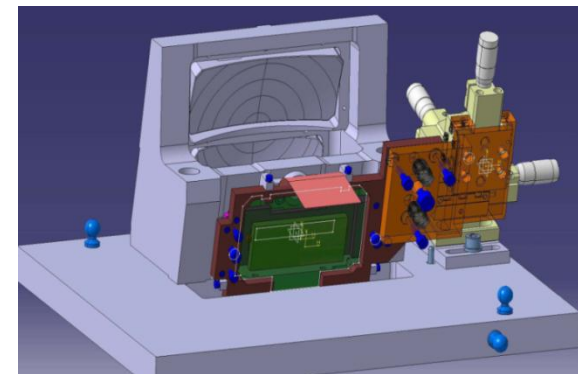
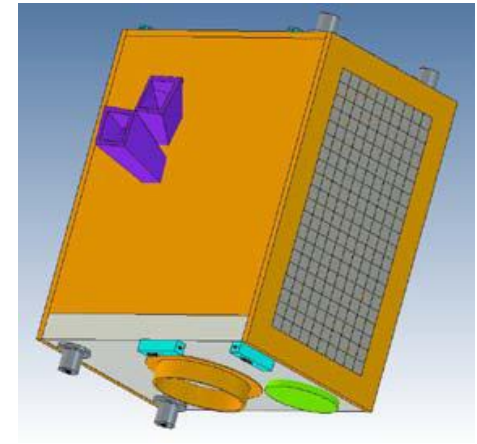
Main Items:

- 1.Design, manufacture and launch of VNREDSat-1 satellite
- 2.Establishment of a Satellite Ground Control Station
- 3.Upgrade of the Remote Sensing Receiving Station (Vietnam National Remote Sensing Center, MONRE)
- 4.Satellite image calibration site
- 5.Procurement of Launch and Insurance services for VNREDSat-1 satellite
- 6.Setting up a communication links between Ground stations
- 7.Training and Transfer of Small Satellite Technology

- The 1st optical earth observation satellite in Vietnam
- Mission: Earth observation in PAN and 4 MS spectral bands
- Revisit time: 3 days
- Orbit characteristics: SSO, 680 km altitude
- Spatial resolution: 2.5m (PAN) và 10m (MS)
- Dimensions: 600 mm x 570 mm x 500 mm
- Total mass: ~130kg
- Life-time: 5 years
- Launch date: 2013



- Orbit characteristics: SSO, altitude ~600km
- Heritages: successful launches of PROBA 1,2, PROBA V, PROBA 3 and PROBA Altius (~100kg, 80x60x60cm, piggyback launch)
- Revisit time: 3 days
- Ground station located in Hanoi with 3-4 satellite contacts/day
- Wide swath width: 250-300 km
- Finance source: Belgium ODA
- Fund: 63 million Euro
- Launch date: 2017



VINASAT

- ❖ Vietnam's telecommunications satellite (VINASAT) provide communication for fishermen at sea, deliver weather forecasts and ensure defense security.
- ❖ VINASAT-1 launched 2008, It cover Vietnam, Laos, Cambodia, Thailand and part of Myanmar.
- ❖ 7/2012: 90% of Vinasat-1 frequency band capacity is used.
- ❖ Main customers of Vinasat-1 : VTV, VTC, VOV, HTV, oil industry, telecommunication groups: Thaicom, Lao Telecom, WebsatMedia (Singapore).



- ❖ Currently there are 150 TV standard HD, SD channels are provided on frequency band of Vinasat-1.
- ❖ Vinasat-1 helps Vietnam save 15 millions USD/year from renting 2.024 foreign telecommunication satellite channels.
- ❖ VNPT expects payback period of 3.900 billions VND for Vinasat-1 is 10 years and get return on investment in the next 5 years.



❖ VINASAT-2 have:

- ✓ Provide to 13,000 channels of telephone/internet/data communications or 150 Television channels
- ✓ greater number of sensor responses
- ✓ higher frequency band capacity
- ✓ minimum lifetime is 15 years
- ✓ from 24-30 transceivers



❖ VINASAT-2 have:

- ✓ Total mass: 3,000 kg
- ✓ Launch date: May 16th, 2012
- ✓ Official exploitation date: 14/7/2012
- ✓ Vinasat-2 main customers are on wider range of business such as: oil, bank, finance. It focus on customers who wish to communicate in remote, border and island areas, and foreign customers including Lao, Cambodia and Myanmar.



Projects for Satellite Data Utilization

- ❖ The system of remote sensing technology to acquire the satellite image data key, image processing, establishment of information systems, upgrading systems for remote sensing application fields in Vietnam:
 - ✓ Donor: Gov. of France
 - ✓ Amount: €19 mil (ODA), 50 bill. VND (GOV funding)
 - ✓ Duration: 2006 -2009
 - ✓ Project Owner: MONRE
 - ✓ Satellite image receiving station (VNGS);
 - ✓ Remote Sensing Center National Data (NDC);
 - ✓ The Center for Applications (DUS) of the industry
 - ✓ Receive data from SPOT-2, 4, 5 and ENVISAT ASAR/MERIS

❖ Monitoring of marine resources and marine areas of Vietnam through satellite:

- ✓ Donor: Gov. of France
- ✓ Amount: €13.9M (ODA)
- ✓ Duration: 2011-2014
- ✓ Project Owner: MARD



THANK YOU!