APRSAF-15: ”Space for Sustainable Development”
Hanoi and HaLong Bay, Vietnam
December 9-12, 2008

SPACE TECHNOLOGY IN VIETNAM: 2008 COUNTRY REPORT

Tran Manh Tuan
Space Technology Institute (STI)
Vietnamese Academy of Science and Technology (VAST)
CONTENT

• VINASAT PROJECT (VNPT)
• ENRSMS PROJECT (MONRE)
• VNREDSAT PROJECT (VAST)
• NATIONAL SCIENCE AND TECHNOLOGY RESEARCH PROGRAM ON SPACE (VAST)
• HOA LAC SPACE CENTER FEASIBILITY STUDY (JETRO & STI)
• CONCLUDING REMARKS
VINASAT PROJECT
Milestone

• 1995: Initiation of the “VINASAT project ” for launching the first Vietnamese communication satellite.
• 1998: Governmental approval of the pre-feasibility study of the VINASAT project.
• May 1999: Establishment of the National Steering Committee on VINASAT project headed by one Deputy Prime Minister.
• October 2002: Governmental approval the basic content of feasibility study of the Project.
VINASAT PROJECT
Milestone

• **October 2005:** The Prime Minister approved VINASAT project. The Viet Nam Post and Telecommunications Group (VNPT) was appointed to the investor of the project. The PM also required VNPT to implement the project.

• **May 2006:** VNPT signed a contract with Lockheed Martin Space Systems to provide a turnkey telecommunications satellite system.

• **January 2007:** The construction of two VINASAT Control Station at Que Duong (Hanoi) and at Bình Dương province is carried out.
VINASAT PROJECT
Milestone

- December 2007: The insurance contract was signed to insure any damages to VINASAT during the launching process and its time in orbit.
- April 19 2008 (Hanoi time): VINASAT-1 was launching successfully by Ariane 5.
- August 2008: The National Steering Committee on VINASAT completed its mission to hand over rights to use VINASAT-1 to VNPT and MIC (Ministry of Information and Communication).
- VNPT was negotiating with domestic and foreign partners to sign new contracts to supply services to its clients in various sectors like trade, banking, transport, education and healthcare (tele education and tele medicine).
VINASAT PROJECT
Artistic picture of VINASAT-1
VINASAT PROJECT
VINASAT-1 Information

- Launch date: 5:15 am (Vietnam time) April 19, 2008.
- Mass: 2.800 kg. Height: 4 m.
- Design, built by Lockheed Martin Corporation.
- Launched by Ariane 5 from Kourou (French Guiana).
- Geostationary orbit location 132 degrees East.
- Primary satellite control station: Que Duong-Hanoi.
- Backup station: Binh Duong Province.
- Lifetime: 15 years.
VINASAT PROJECT
VINASAT-1 Coverage

- Extended C-band coverage: Vietnam, Asian, China, Korea DPR of, Rep. of Korea, India, Japan and Australia.

- KU-band coverage: Vietnam, Laos, Cambodia, Thailand and part of Myanmar.
VINASAT PROJECT
VINASAT-1 Control Station
VINASAT PROJECT
VINASAT-1 Launching
THE ANNOUNCEMENT CEREMONY OF VINASAT-1 SATELLITE LAUNCH
Hanoi, April 19, 2008
VINASAT PROJECT
VINASAT-1 Significance

• Successfully launching the first satellite is of great technological, social and economic significance. This event will help raise Vietnam’s image in the international arena. This is a memorable milestone for Vietnam and its integration into the world economy.

• Vietnam become the sixth nation in the region having its own satellite.

• Full operation of VINASAT-1 will facilitate the completion of a national communications infrastructure. This help Vietnam bring telecommunications, Internet and television services to all isolated, mountainous and island areas, where other means of transformation is not feasible.
VINASAT PROJECT
VINASAT-1 Services and Applications

- Transponder Leasing
- VSAT (Very Small Aperture Terminal)
- Teleport Services
- SNG (Satellite News Gathering)
- Contribution links
- Direct To Home (DTH)
The implementation agency of this project is MONRE. The objective of ENRMS project is to establish the Environment, Natural Resources Monitoring System with three following components:

- A Ground receiving station (VNGS);
- A National remote sensing Data Centre (NDC);
- A Data User System (DUS).

The ground receiving station is located in Minh Khai, commune, Tu Liem district, Hanoi. From 2008, the whole system is under management and operation of the National Remote Sensing Center (MONRE).
ENRMS PROJECT
3 components of the project

• Environment, Natural Resources Monitoring System (ENRMS)
ENRMS PROJECT
Ground receiving station
ENRMS PROJECT
Ground receiving station
ENRMS PROJECT
National remote Sensing Data Center (NDC)

• The role of NDC is to produce higher level products, create and manage a nationwide common use remote sensing database. It is linked with VNGS through the internal local area network and with DUS through wide area network and can online accept the request from users, co-operate with VNGS to meet the user’s requirement.

• The NDC consists of:
  ✓ Management System (MS);
  ✓ Product Generation System (PGS);
  ✓ Data Archiving System (DAS);
  ✓ User Support System.
ENRMS PROJECT
Data User System (DUS)

1. Department of Surveying and Mapping (MONRE)
2. Land Investigation and Planning Centre (MONRE)
3. Vietnamese Environment Protection Agency (MONRE)
4. Marine Hydro-Meteorological Centre (MONRE)
5. Research Institute of Geology and Mineral (MONRE)
6. Vietnamese Research Institute of Land Administration (MONRE)
7. Forest Investigation and Planning Institute (MARD)
8. National Institute of Agriculture Planning and Projection (MARD)
9. Institute of Water Resources Research (MARD)
10. Space Technology Institute (VAST)
11. Institute of Geology (VAST)
12. Institute of Geography (VAST)
13. Search and Rescue Committee
14. Department of Aquaculture Resources Exploitation and Protection
15. Vietnam Petroleum Institute (Petroleum General Department)
16. Faculty of Geography (Hanoi National University)
VNREDSAT-1 PROJECT
(Vietnam Natural Resources, Environment and Disaster monitoring small SATellite)

- According to the strategy, to master the small satellite technology serving natural resources, environment and disaster monitoring, Vietnam must go through two periods:
  - 2006-2010: Vietnamese scientists and engineers must learn and receive the small satellite technology transfer from the developed countries;
  - 2011-2020: Vietnamese scientists and engineers must develop indigenous capability to build small satellite.
- VNREDSAT-1 is the project for building and launching the first optical EO satellite of Vietnam in 2012.
- The implementation agency of the project is VAST
VNREDSAT-1 PROJECT
Requirements

• Technical requirements:
  – Payload: 2 optical sensors (2.5-4m-resolution panchromatic and 10m-resolution 4-spectral bands);
  – Revisit time: 3 days;
  – Launch mass: about 150kg;
  – Mission life: 5 years.

• Financial requirement: The budget for project implementation must be from ODA loan source.
VNREDSAT-1 PROJECT

• August 2007: VAST has completed the feasibility study of VNREDSAT-1 project and submitted it to the P.M.

• September 2007: Based on the review of MOST, MPI, MONRE and MOF the P.M approved the feasibility study and asked MPI to send an ODA request to French Government.

• August 2008: MPI received official letter from French Government and Belgium Government confirming ODA loan for the project is available.
National Research Program on Space Science and Technology

• In 2007 under the direction of MOST, VAST has coordinated with relevant Ministries to prepare the objectives and content of a National Research Program on Space Science and Technology for the period from 2008 to 2010.

• In 2008, MOST asks VAST to adopt and implement the National Research Program.

• The 2008 budget of the Program: 6 billions VND.
National Research Program on Space Science and Technology

The main topics of the program in the period 2008-2010 are:

• Legal basis for peaceful use of outer space.
• Application of RS, GIS, GPS and communication satellite for economic development; natural resources, environment and disaster monitoring and improve quality of life.
• Fabrication some equipments and low cost meteorological ground receiving station.
• Small satellite technology.
• Launching technique.
• Basic research relating space science and technology.
Hoa Lac Space Center Project Feasibility Study

- The full name of the project is Hoa Lac R&D Center for Space Technology project.
- In July 2008, the Japanese Ministry of Economics, Trade and Industry (METI) set up a consulting group, under the Japan External Trade Organization (JETRO), to do feasibility study of the Hoa Lac Space Center.
- On August 18, 2008, STI and JETRO signed a cooperation agreement on writing the feasibility study report for the Hoa Lac Space Center project.
- According to a workshop introducing JETRO Study Team’s report on this project, held in Hanoi on November 27 2008, the budget for this project will be coming from Japan’s ODA sources.
Hoa Lac Space Center  Project  
Feasibility Study

• The Hoa Lac Space Center will be built on 9 ha of land in the Hoa Lac Hi-tech Park, 30 km from Hanoi’s center. The center will have a space technology operating zone, a small satellite assembly, integration and testing zone, a planetarium, a research and training zone and a ground receiving station of natural resources, environment and disaster monitoring small satellites.

• The feasibility study of the project will be submitted to both governments (Viet Nam and Japan) for examination.
Hoa Lac Space Center Model
Flood in Hanoi and ALOS PALSAR Emergency Observation

- In October 30 and 31, 2008, Hanoi suffered the heaviest rain in 35 years: street turned into river, power shut down in several districts. The non-stop heavy rain was going until November 1st.

![Bar chart showing rainfall in different districts of Hanoi. The chart displays the following rainfall in mm: Hà Đông 700, Giã Lắm 523, Đông Anh 513, Chương Mỹ 555, Nip Thành 475.]
Flood in Hanoi

- Racing between a bus and a boat?
- Local residents use self-made vehicle
Flood in Hanoi

- Street become river
- Flooded car
Flood in Hanoi

• Fishing on a park

• Catch fish on the street
Flood in Hanoi and ALOS PALSAR Emergency Observation

• Emergency observation request from Institute of Geography (VAST) has been ordered on Nov. 4 through ADRC. Response has been made almost immediately.

• PALSAR in fine and polarimetric modes on Nov. 5 and 7 were provided. Reference data: from Aug. 5 and Sep. 22. In total 8 scenes.

• Data from Sep. 22 ascending, Nov. 5 descending and Sep. 7 ascending were used for flood analysis
Flood in Hanoi and Red river delta as seen by ALOS PALSAR (Result of Institute Geography-VAST)
ANOTHER APPLICATION OF ALOS PALSAR

OIL SLICK DETECTION
Result of STI (VAST)
CONCLUDING REMARKS

• In 2008, Vietnam have many progress in realization the “Strategy for research and application of Space Technology until 2020”.

• International cooperation in Space Science and Technology is very important for Vietnam to face with the negative impacts of global warming and climate change and to attain a sustainable development.
THANK FOR YOUR ATTENTION