RECENT ACTIVITIES OF VIETNAM IN SPACE TECHNOLOGY APPLICATIONS

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Introduction

- Space Technology has been started in Viet Nam since 1980 with the UNDP’s projects for promoting the utilization of satellite data in land survey, and particularly by the joint Soviet Union – Viet Nam piloted spaceflight.
- After more than 20 years of Space Technology application and research, Viet Nam is still standing at the low level in the Asia Pacific region.
- One of the main reasons are the lack of a National Strategy for Space Technology Development and a unique steering structure at the National level, causing overlapping of actions and disabling interdisciplinary collaboration.
• In June 2002, Prime Minister asked VAST in collaboration with MOST (Ministry of Science and Technology) and relevant ministries to prepare a National Strategy for Research and Applications of Space Technology.
• On 14/06/2006 the final draft of the Strategy has been approved by the Prime Minister.
Main tasks and projects of the Strategy

- Establishment of the Viet Nam Space Commission (VNSC).
- Establishment of the Space Technology Institute (STI) inside VAST.
- VINASAT project.
- Natural Resources and Environment Monitoring System project.
- Project of Small satellite for earth observation.
Establishing the Viet Nam Space Commission (VNSC)

- One of the first tasks of the Strategy is to establish Viet Nam Space Commission (VNSC).
- The main functions of VNSC are:
  - To co-ordinate all space activities implementing the projects or tasks of the Strategy.
  - To represent of Viet Nam in participating international space activities and organizations.
- The Minister of MOST will be the President of VNSC. The President of VAST will be Vice President of VNSC. The deputy ministers of relevant ministries are members of VNSC.
Establishing the Space Technology Institute (STI)

- STI will be the first national research institute of VN in space science & technology.
- Vietnamese Academy of Science and Technology (VAST) is the largest national institution in Viet Nam, responsible for research and development in natural sciences and technology. So far, VAST consists of 18 research institutes.
- In organization, VAST is affiliated directly to the Vietnamese Government.
- STI will be established as the 19th national institute of the Vietnamese Academy of Science and Technology.
HEADQUARTERS OF VAST
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VINASAT Project

- The “VINASAT Project” for launching the first Vietnamese communication satellite was initiated in 1995 and was approved by the VN Government at the end of 2002.
- The Vietnam Posts and Telecommunications (VNPT) Group (Ministry of Post and Telematics-MPT) is responsible for this project.
- In 02/2006 International bidding for manufacturing and launching VINASAT attracted three bidders: Lockheed Martin from USA, Astrium/Alcatel Alenia Space from France and Sumitomo Corporation from Japan. The winner is Lockheed Martin.
- On 12/05/2006 Lockheed Martin's Commercial Space Systems division signed a contract with the VNPT Group, that a turnkey telecom satellite system will begin operations at the end of 2008.
- VINASAT-1, the first communication satellite will be based on A2100A spacecraft platform of Lockheed Martin and provided with C-/Ku-band transponders. The satellite is designed for a minimum service life of 15 years, and will be located in the geostationary orbital slot 132 degrees east.
“Natural Resources and Environment Monitoring System” Project

- MONRE (Ministry of Natural Resources and Environment) is carried out this project. The technical system of the project consists of:
  - Viet Nam ground station (VNGS)
  - National Data Center (NDC)
  - Data Utilization Systems (DUS).

- The VNGS uses multi-sensor receiving technology of EADS (European Aeronautic Defense and Space company).

- The VNGS is located at Tu Liem district (Hanoi) and will be operating from the end of year 2007 under the management of Remote Sensing Centre (RSC)- a department of MONRE.
EO Small satellite project

- Following the approved Strategy, there are two periods for development of small satellite technology in Viet Nam:
  - In 2006-2010 – technology transfers from developed countries.
  - In 2011-2020 – develop itself small satellite technology.
- “EO Small satellite project” is expected to be funded by ODA during 2006-2010.
- VN is interested in taking part in a constellation of small satellites (both optical and radar).
- VAST is responsible for this project.
Small satellite project (cont’d)

- In order to prepare a feasibility study of the small satellite project, VAST is co-operating with some Space Technology Agencies to study the latest progresses of small satellite technology. Some companies offered their products for technology transfer as following:
  - SSTL (UK)- satellite model in Disaster Monitoring Constellation (DMC).
  - EADS Astrium - Astrosat 100 and AstroSAR Lite model.
  - SpaceBel (Belgium)- Proba model.
  - KAI (Korea Aerospace Industries) –Vsat – a modified KoDsat Model.
  - SatrecI (South Korea)- MACSAT model.
- Capacity building is a main concern: a first group of young engineers of VAST was sent in 2005 to KAI for a short on-job-training course in small satellite technology.
JAXA-VAST Agreement

• Agreement concerning examination and definition of potential cooperation on Space Development and Applications between VAST and JAXA was signed in 29/6/2006 in Ha Noi between:
  – JAXA President – Dr. Keiji Tachikawa and
  – VAST President - Acad. Dang Vu Minh.

• Two sides will exchange information and cooperate in the fields of following:
  – Small Satellite development and its applications.
  – Joint research toward utilization of Kibo module of ISS.
  – Capacity building.
Signing Ceremony of the JAXA-VAST Agreement (29/6/2006, Ha Noi, Viet Nam)
Space Education Workshop
UNESCO-APRSAF-VAST (Ha Noi, 3/2006)

• The workshop is co-organized and funded by UNESCO, APRSAF and VAST in 3 regional cities of Viet Nam (Ha Noi, Hue and Ho Chi Minh city) from 4 - 8/03/2006.
• About 300 Vietnamese participants (school children, students, teachers, researchers, policy makers) and 14 international speakers attended the workshop.
• In the workshop, UNESCO representatives have offered 6 telescopes to Vietnam for Space Education in High junior schools.
Space Education Workshop in Ha Noi (March 4th, 2006)
Space Education Workshop
The quiz session
Space Education Workshop
School pupils prepared for launching water rockets
Applications of Remote Sensing

• Applications of Remote Sensing have been (and will be) carried out mainly for land-use administration (connected with development and applications of GIS), environment and natural resources monitoring, and disasters management. Some recent examples:
  - Research project “Application of Remote Sensing and GIS Technology for Landslide Hazard Mapping in mountainous area of Vietnam” (funded by JAXA and implemented by Institute of Geography, VAST)
  - drought monitoring and prevention in Binh Thuan Province.
  - flood monitoring in Mekong River Delta.
  - forest fire assessment in U Minh Thuong national park.
REMOTE SENSING APPLICATIONS FOR DROUGHT MONITORING AND PREVENTION

SPOT IMAGES OF BINH THUAN

31 May 2001

18 May 2003

9 March 2005
Dry land in Binh Thuan province
REMOTE SENSING APPLICATIONS FOR FLOOD MONITORING IN LOWER MEKONG DELTA
Dry season

Spot image February 18, 2004

Rainy and flooding season

Spot image November 30, 2004
RS APPLICATIONS FOR FOREST FIRES ASSESSMENT

Forest fire at the National Park U Minh Thuong

SPOT image on 8/1/1995

SPOT image on 28/9/2002

Burnt area after 5 months of fire
Applications of Passive Microwave Remote Sensing
Radiometer measurements of sea surface temperature (SST) in Ha Long Bay - North Vietnam sea
Conclusions

• In VN, the main emphasis is made in various applications of space technology, making it feasible and beneficial for the country’s social-economic sustainable development.

• The priorities in coming years:
  - to build up the institutional and legislation mechanism for research, management and coordination of the space activities, at the national level (establishment of National Space Commission, STI, national research program in ST, ..)
  - to build up step-by-step first necessary space infrastructures (communication satellites, ground stations, EO satellites, testing facilities, …)
  - to promote applications in some selected fields: land-use administration, disasters and environment management, communication, GPS and GIS, ...
  - Capacity building, including training of young generation in ST.
Conclusions (cont’d)

• It is essential for VN to expand the international cooperation in space technology:
  - in R &D
  - in using international space infrastructures for the country’s needs (especially for disasters mitigation)
  - in training and capacity building.
THANK YOU