

COMMITTEE ON THE PEACEFUL USES OF
OUTER SPACE
Scientific and Technical Subcommittee
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International cooperation in the peaceful uses of outer space: activities of Member States

I. Introduction

In the report on its forty-fourth session, the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities (A/AC.105/890, paragraph 17).

In a note verbale dated 10 September 2007, the Secretary-General invited Governments to submit their reports by 30 October 2007. The reports received by 31 December 2007 are contained in documents A/AC.105/907 and A/AC.105/907/Add.1.

The present document contains reports received since January 2008 and will be made available as Addendum 2 of document A/AC.105/907, following the conclusion of forty-fifth session of the Scientific and Technical Subcommittee.

**SUMMARY OF ACTIVITIES
CHILEAN SPACE AGENCY
2007**

Established by Supreme Decree No. 338, of 17 July 2001, the Chilean Space Agency has the following basic functions:

- To advise the President of the Republic on all matters concerning the identification, formulation and implementation of policies, plans, programmes, measures and other activities relating to space and to serve as the coordinating authority for public bodies responsible for such matters;
- To draw up and propose a law establishing an institutional framework for the development of space activities on a permanent basis;
- To propose the national space policy and measures, plans and programmes for its adoption or execution.

Since 2001, a national space community has been developing and expanding in the academic and scientific spheres, in the State administration (ministries, departments, prefectures, municipalities and public services) and in the private sector. A register of specialized human resources trained in space science has been compiled. During 2007, an important strategic working alliance was formed with the National Land Information Coordination System (SNIT) (www.snit.cl), which is a ministerial council engaged in national land data management, a major aspect from the remote-sensing user's perspective.

Through active participation in the United Nations and the conclusion of intergovernmental agreements and memorandums of understanding with the space agencies of the Russian Federation, China, Ecuador, France, Israel, the Republic of Korea, Spain, Ukraine and Brazil, as well as with the United Nations Office for Outer Space Affairs and the International Space University, a network of international contacts has been established. Moves to sign space agreements with India, Argentina, Germany, South Africa, Guatemala, Colombia and the United Kingdom are at an advanced stage.

Since 2005, the Chilean Space Agency has been working on the implementation of the Earth observation satellite project. On 21 December 2007, nine international space companies were invited to submit tenders and it is hoped that a contract will be awarded during March 2008.

With regard to the two basic tasks allocated to the Agency under its founding decree, the results obtained to date are outlined below:

- Concerning the national space policy, a proposal was transmitted to the President of the Republic, Dr. Michelle Bachelet Jeria, during the last quarter of 2007 and is expected to be promulgated by Government House as an official document during the first quarter of 2008;
- Concerning the drafting of a law permanently establishing the Chilean Space Agency as a public service, with its own assets and legal personality, a bill has now been drawn up. On instructions from the Office of the President, however, steps are being taken to set up an agency, as an interim measure, which will take the form of an interministerial council based at the Ministry of Finance. The text of the draft supreme decree was sent to the Ministry of Finance in 2007 and it is hoped that the matter can be finalized by the end of the first quarter of 2008.

During 2007, progress was made on installing a latest-generation Earth station for direct reception of satellite images by the aerial photographic mapping service of the Chilean Air Force. This is a public service, which will form a key part of the overall national architecture of the land segment allotted to outer space use. It is hoped that it will be opened in the first quarter of 2008.

Plans were made in 2007 for the organization of the international space conference on space technology and climate change to be held, under the chairmanship of Mr. Raimundo González Aninat, Ambassador on Special Mission, on 1 April 2008 during the 2008 International Air and Space Fair (FIDAE 2008), which will be officially opened by the Minister of National Defence, the Undersecretary of the Aviation Ministry, the Commander-in-Chief of the Chilean Air Force and the Director for Special Policy of the Ministry of Foreign Affairs.

Plans were also made during 2007 for Chile's participation in FIDAE 2008, with the installation of a 32-square-metre stand displaying the activities of the Chilean Space Agency.

The following steps have been taken with a view to the execution of the project to acquire an optical Earth observation satellite:

- During 2007, a request for information was issued to 25 international space companies, from 15 of which information was received and analysed under an evaluation process;
- As a result of the evaluation, a request for proposals for the acquisition of an Earth observation satellite was made to nine international space companies. The request for proposals was issued on 21 December 2007 and it is hoped that the proposals will be received by the end of February 2008 and a contract awarded and signed in March 2008. The budget for this project is US\$ 70 million (see the press release on the website www.defensa.cl).

An academic and scientific network with an interest in space issues has been set up and developed, comprising 12 of the country's most renowned universities, including the Pontifical Catholic University of Chile, the University of Chile, the Federico Santa María Technical University, the University of Santiago de Chile, the University of Concepción, the Universidad Católica del Norte, the Catholic University of Temuco and the Universidad Austral de Chile. This scientific community is involved, as an advisory panel, in the process of assessing the proposals for a satellite system and the implementation of the national satellite operating system.

With regard to space debris, a coordination network has been set up with a number of national research centres and the General Directorate of Civil Aeronautics in order to undertake appropriate coordination on the basis of notifications of re-entry of space objects to Earth, using notices to airmen (NOTAMs).

The Chilean Space Agency continues to conduct pre-feasibility studies on the use of geostationary orbit positions assigned to Chile by the International Telecommunication Union for a future satellite telecommunications project.

During 2007, support was given to university students in the preparation of degree dissertations on topics covering remote sensing applications, telecommunications and satellite engineering.

In the fourth quarter of 2007, the Ministry of National Property allocated a 1,000-square-metre, two-story government property in the centre of Santiago as the new headquarters for the Chilean Space Agency. The building (No. 165 Calle Dieciocho) is part of the country's historic heritage. It is hoped to secure the necessary resources for repairs and refurbishment during 2008.

In the area of space law, special mention should be made of a lawyer's role as consultant to the Chilean Space Agency and important participation in the following events:

- Forty-sixth session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS), held in Vienna, Austria, from 26 March to 5 April 2007;

- Fiftieth session of COPUOS, held in Vienna, Austria, from 6 to 15 June;
- The symposium “Global Earth Observation System of Systems (GEOSS) in the Americas”, held in Brazil from 17 to 19 September 2007;
- The Group on Earth Observations Ministerial Summit, held in Cape Town, South Africa, from 28 to 30 November 2007.

At each of these meetings, particular stress was laid on seeking a balance between the obligations arising out of the provisions of space law and the use of space applications for the benefit of developing countries;

The promotion of space law in Chile has also been programmed with the organization of public information seminars and activities with a view to building up a critical mass of specialists.

**REPORT FOR 2007 ON THE NATIONAL ACTIVITIES AND INTERNATIONAL
COOPERATION OF THE RUSSIAN FEDERATION IN THE FIELD
OF SPACE RESEARCH AND THE USE OF OUTER SPACE
FOR PEACEFUL PURPOSES**

(as at 31 December 2007)

The national activities of the Russian Federation in 2007 in the use of outer space for peaceful purposes were carried out by the Russian Federal Space Agency (Roskosmos) through the Russian Federal Space Programme, the Global Navigation Satellite System (GLONASS) special federal programme and other special programmes in cooperation with the Russian Academy of Sciences, the Ministry of Defence of the Russian Federation, and other clients and users of space information and services.

In 2007, the Russian Federation carried out 26 carrier rocket launches, one of them unsuccessful, with 48 space objects launched (18 Russian space vehicles and 30 belonging to other countries).

There were 20 carrier rocket launches from the Baikonur launch site, with 42 space vehicles launched.

There were five carrier rocket launches from the Plesetsk launch site, with five space vehicles launched.

One space vehicle was put into space from the launch base in the Orenburg region.

The following Russian space vehicles were launched:

- Two manned Soyuz TMA spacecraft (Soyuz TMA-10 and -11);
- Four Progress M unmanned cargo vehicles (Progress M-59, -60, -61 and -62);
- One experimental research space vehicle (Foton-M3);
- One Raduga-1 space vehicle;
- Ten Cosmos space vehicles (Cosmos-2427 – -2436);

The following space vehicles belonging to other countries were launched:

Anik-F3 (Canada), TerraSAR-X (Germany), SAR-Lupe (Germany), Egyptsat-1 (Egypt), Saudisat-3 (Saudi Arabia), Saudicomsat-3 (Saudi Arabia), Saudicomsat-4 (Saudi Arabia), Saudicomsat-5 (Saudi Arabia), Saudicomsat-6 (Saudi Arabia), Saudicomsat-7 (Saudi Arabia), Libertad-1 (Colombia), CP3 (USA), CP4 (USA), CAPE-1 (USA), Aerocube-2 (USA), CTSB (USA), MAST (USA), four Globalstar satellites (USA), Genesis-2 (USA), DirecTV-10 (USA), Globalstar-2 (four satellites, USA), Sirius-4 (Sweden), and Radarsat-2 (Canada).

MAIN RESULTS

A. MANNED FLIGHT PROGRAMME

In 2007, in accordance with its international obligations regarding the development and operation of the International Space Station (ISS), the Russian Federation launched one manned transport spacecraft and three cargo spacecraft, controlled and tracked the flight of the Russian segment of the ISS and implemented the planned programme of research and experiments.

In 2007, space experiments in a wide range of research areas were performed in the Russian segment of the ISS. Work was done on 43 experiments, 34 of them Russian.

B. SPACE TECHNOLOGY APPLICATIONS PROGRAMMES

1. Space communications, television transmission and navigation

In 2007, space systems continued to be used in maintaining a single information space in the Russian Federation and providing modern telecommunications services for various users.

The orbital network for space communications, television transmission and navigation includes the following space vehicles: Ekspress-A, Ekspress-AM, Yamal-100, Yamal-200 (communications, television), Ekran-M, Bonum-1, Gonets-D1, Gonets-M (communications), Glonass, Glonass-M and Nadezhda (navigation, search and rescue).

GLONASS continued to operate.

At present, the number of operating satellites in the GLONASS system is 21 (13 of them Glonass-M satellites).

It is planned to expand the GLONASS system orbital network to 24 satellites by the end of 2009 (global coverage).

In order to replenish the Russian segment of the International Satellite System for Search and Rescue (COSPAS-SPARSAT), work is under way to construct and launch in 2008 two small Sterkh satellites, which are more than five times lighter and will remain in service two and a half times longer than their predecessors.

So far, over 20,500 persons have been rescued with the help of COSPAS-SARSAT, including over 1,000 citizens of the Russian Federation and other CIS countries.

2. Remote sensing of the Earth, meteorological observations, environmental monitoring and natural disaster management

The natural resource satellites Resurs-DK and Monitor-E are currently in orbit.

The Resurs-DK high-precision observation satellite provides images of the Earth's surface with a resolution of up to 1 m.

Work is near completion on the development of two new-generation hydrometeorological satellites, the medium-orbit Meteor-M and the geostationary Elektro-L, which are expected to go into service in 2008.

In order to achieve the most comprehensive possible monitoring of the environment, work is under way on the gradual creation and improvement of space facilities within the framework of an advanced Earth remote sensing satellite system that will include:

- Geostationary meteorological satellites for the observation of large-scale processes affecting the global weather that take place in the atmosphere and at the Earth's surface in the tropics and, partly, at higher latitudes (Elektro-L);
- Polar-orbiting meteorological satellites at relatively low altitudes (800-1,000 km) for the global integrated observation of the atmosphere and the Earth's surface (Meteor-M, 1 and 2);
- Real-time optico-electronic observation satellites providing information relevant to sectors of the economy connected with the use of natural resources (Monitor-E, Resurs-DK, Resurs-P);
- Satellites for radiophysics-based observation, equipped with radiolocators, microwave radiometers and multispectral surveying instruments for operating in the visible and infrared regions of the spectrum for studies of the ice along the Northern Sea Route in the Arctic and for many other oceanographic and oceanological studies (Meteor-M3);
- Observation satellites using high-precision radiolocation, for all-weather surveying of the Earth, which is particularly important in high-latitude regions of the Russian Federation where many oil and gas companies are operating (Arkon-2); and

- Satellites for the monitoring of disasters and the investigation of potential earthquake precursors (Kanopus-B).

In 2007, work continued on developing the main Earth remote sensing information centre. New stations for receiving, processing and storing data are being set up, and a data collection system for Eurasia was launched.

3. Natural disaster management using space technology

One of the priority areas of the Russian Federation's space activities is the development of space technologies and information support for natural disaster management, including:

1. The forecasting, detection and monitoring of hazardous phenomena in the atmosphere and at sea (hurricanes, gales, typhoons, ice formations etc.) using data from satellites of the Meteor and Elektro types obtained in various regions of the optical and radio (ultra-high-frequency) ranges of the electromagnetic wave spectrum;

2. The detection and monitoring of floods using data from satellites of the Meteor-M, Monitor-E and Resurs-DK types. New space technologies for the provision of information to facilitate natural disaster management are to be developed and applied; and

3. The detection and monitoring of forest fires that cover an area of more than 40 hectares, using the smoke plume and data from satellites of the Meteor-M, Resurs-DK and Monitor-E types obtained in the visible and infrared ranges of the electromagnetic wave spectrum. Consideration is being given to equipping satellites with state-of-the-art infrared instruments for the early detection and monitoring of the boundaries of forest fires covering an area of more than 0.1 hectares.

C. RESEARCH PROGRAMMES

During 2007, the Russian Federation participated in foreign projects in the field of fundamental space research. The main space research results in 2007 were obtained during observation programmes conducted on board the International Gamma-Ray Astrophysics Laboratory (INTEGRAL) of the European Space Agency (ESA). Russian scientists took an active part in competitive observation programmes, in the course of which significant results were obtained in relation to the dynamics of superheavy bodies in the centres of galaxies and the evolutionary processes of neutron stars.

In addition, research continued in 2007 on cosmic rays and corpuscular flows within the framework of the Russo-Italian RIM-Pamela project. The number of antiprotons and positrons registered in series exceeds all global statistics in this area to date. Work on the project is planned to continue until the end of 2009.

In the field of planetology, studies of Mars and Venus using Russian instruments (the Planetary Fourier Spectrometer (PFS), SPICAM, OMEGA, ASPERA, HRSC and MARSIS) carried on board Mars Express and Venus Express continued. Further investigations of the planets' surface and atmosphere were made and the data obtained are being processed and analysed.

Work continued on board the American Mars Odyssey spacecraft on detecting and localizing sub-surface aqueous ice on Mars, using the HAND instrument complex, which the Russian Federation helped to develop. This makes it possible to register fast neutron flows from the surface of Mars caused by the action of solar winds. It is planned to continue the research in 2008-2009.

Investigations of gamma bursts and transient phenomena using the Konus-A instrument within the framework of the Russo-American Konus/WIND project continued in 2007.

On board the Russian research satellite Kompas-2, which went into operation in October 2006, scientific data are being received on volcanic activity and various kinds of geophysical research are also being conducted.

Russian and European scientists and engineers continued with preparations for the flight in 2007 of the Russian robotic biosatellite Foton-M3, which was launched on 4 September 2007 and returned to

Earth 12 days later after successfully completing its research programme. In the course of its flight, the Foton-M3 carried out 26 separate scientific experiments.

D. COMMERCIAL USE OF SPACE TECHNOLOGIES IN THE RUSSIAN FEDERATION

On the basis of the results of space activities, world-class high-tech items are being produced.

The main trends in the creation of innovative goods and services benefiting the Russian economy in 2007 are:

- Development of navigational methods, Earth remote sensing satellites, space communications and information science;
- Development and production of instruments for the fuel and energy complex;
- Development of new kinds of medical and rehabilitation technology;
- Development of new materials and advanced processes for manufacturing them;
- Development of instruments for the processing branches of the food and building industries.

E. INTERNATIONAL COOPERATION

In the Russian Federation, together with various ministries and other departments, and also with enterprises developing rocket and other space technologies, Roskosmos contributed to international cooperation in space activities in 2007 in the following main areas:

- Use of Russian facilities to launch foreign payloads;
- Implementation, in cooperation with ESA, France and European industry, of a project for constructing facilities for the launching and adaptation of Soyuz-ST carrier rockets at the Guiana Space Centre in French Guiana, with work on promising means of launching heavy payloads (Ural project);
- Partnership in the establishment and operations of the ISS and in on-board investigations;
- Further development of the international search and rescue system COSPAS-SARSAT (with Sterkh satellites);
- In the field of fundamental space research, implementation of the Spektr-RG Space Observatory project, with the extensive cooperation of foreign partners;
- Implementation of space technology projects (with Foton-M);
- Joint development with Brazil of a carrier rocket.

The following activities may be undertaken in 2008 for the further development of international cooperation:

- Carrying of payloads of foreign design and manufacture on board modifications of satellites of the Meteor-M and Resurs-DK types and future satellites of the Elektro-L type;
- Carrying of Russian scientific instruments on board foreign satellites within the framework of the Lunar Reconnaissance Orbiter (NASA) and other projects;
- Russian participation in the GMES and GEO programmes;
- Russian participation in the European programme for monitoring forest fires and emergency situations and forecasting earthquakes, using equipment on board Meteor-M and Resurs-DK.

Proposals have been drawn up for Roskosmos to join the International Charter "Space and Major Disasters", which provides for cooperation on the authorized use of space resources in situations of natural or man-made disasters.

Contractual services were provided in 2007 for the launch of foreign satellites using Russian carrier rockets of various classes (11 successful launches, in which 30 satellites were launched).

The Russian Federation possesses a range of facilities that permits the launching into Earth orbit with different inclinations of payloads weighing from a few hundred kilograms to 20 tons. Its Soyuz and Proton carrier rockets have been modernized (Soyuz-2 and Proton-M). With a view to, inter alia, providing guaranteed access to space, work is under way on the development of advanced launching facilities, including the Angara family of carrier rockets and the Air Start rocket-space complex.

For the launching of small lightweight satellites, programmes are under way for the introduction of launching methods based on converted rockets within the framework of the Start, Rokot and Dnepr projects.

In 2007, there were three successful launches of foreign satellites by means of Proton-M carrier rockets.

To date, the Russian Federation has concluded inter-State and intergovernmental agreements with over 20 countries on cooperation in the investigation and use of outer space. Also, Roskosmos has signed agreements with the space agencies of 26 countries and ESA on joint space projects, as well as a large number of special agreements.

F. SPACE DEBRIS

Space activities worldwide are leading to an increase in the man-made pollution of circumterrestrial space and consequently impairing the safety of space flights. The Russian Federation is paying close attention to resolving the problems of space debris.

The Federal Space Programme for 2006-2015 provides, in the appropriate sections, for activities directed towards resolving the problems of space debris.

A definitive text was established in 2007 for the Russian All-Union State Standard (GOST) R, "Space technology products. General requirements for products to restrict man-made pollution of circumterrestrial space". The standard was brought into line with the requirements of the Space Debris Mitigation Guidelines adopted at the forty-fourth session of the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) and adopted at the fiftieth session of COPUOS.

The principal measures applied to Russian satellites, carrier rocket stages and boosters in 2007 include:

- Reduction of the pressure in propellant tanks and venting of the residual propellant in Proton-M and Soyuz-2 carrier rocket stages;
- When the booster is separated from the Breeze-M upper stage, there is no pollution of circumterrestrial space by small operational elements, while residual propellant and gases are drained in circumterrestrial space when the supplementary propellant tank is separated from the Breeze-M upper stage;
- The construction of the upper stages of the carrier rocket Dnepr avoids the pollution of circumterrestrial space by small operational elements by ensuring that pyrotechnic fasteners and elements of the separation system and similar equipment remain within the stage;
- In the upper stage of the Cosmos-3M carrier rocket, the construction of extractors for the satellite separation system has been refined to exclude discarding operational elements into circumterrestrial space;
- Considerable thought is being given to the feasibility of removing satellites from operating orbits by means of the electric propulsion systems that are normally used for altitude correction.

In 2007, development work continued on the functional components of an automated long-term forecasting and warning system for dangerous situations likely to affect functioning orbital networks and

related objects and Earth caused by man-made and natural factors and on ways of reducing the risks associated with such dangerous situations.

An important factor in reducing the danger of man-made pollution is to establish an inventory of the objects polluting circumterrestrial space, especially within the geostationary orbit. To that end, the Keldysh Institute of Applied Mathematics and the Pulkovo Observatory in the Leningrad region have organized an international network of 18 observatories covering the entire geostationary orbit. The observations conducted in 2004-2007 led to the identification of about 300 new objects in the geostationary orbit.

Work in the Russian Federation on resolving the problems arising from man-made pollution of circumterrestrial space is conducted within the framework of existing legislation governing space activities but with due regard for the introduction of appropriate practical preventive measures by the space agencies and organizations of other States.

United Kingdom Space Activities report for 2007

The 2007 UK Space Activities brochure is the British National Space Centre's annual publication that covers the events and activities of the previous 12 months and looks ahead to the coming year. Copies will be made available to all Delegations at the UN COPUOS meetings in 2008.

This year has demonstrated the importance of European and international collaboration for space exploration, Earth observation and satellite services. UK has had major involvement in a number of launches, including METOP, the new low earth orbit weather satellite; and STEREO, which investigates solar flares. Work has also started on Europe's first mission to Mercury.

The UK has supported the development of a European Space Policy, comprising ESA, the European Union and Member States, which was agreed in May 2007, and highlighted the opportunities in the space element of the EU's Framework Programme 7.

BNSC and NASA are working together to identify areas for technological and scientific collaboration for future lunar exploration, and an agreement with the Algerian Space Agency has been implemented. The UK has been working with 13 other nations in the Global Exploration Strategy team and is considering a report from the independent Space Exploration Working Group on how best to engage in the Strategy. The UK took a leading role in International Polar Year and International Heliophysical Year.

The UK's space objectives and organisation have also been considered afresh. The House of Commons Science and Technology Committee issued a major report on UK space; and a new space strategy for 2008-12 has been under preparation.

BNSC coordinates UK civil space activities and is at the heart of UK efforts to explore and exploit space. It is made up of 10 Government Departments, Research Councils and the Met Office. BNSC is now hosted by the new Department for Innovation, Universities and Skills (DIUS). A new Research Council, the Science and Technology Facilities Council (STFC), is responsible for coordinating the UK's space science efforts.

The UK celebrated the 50th anniversary of spaceflight with an event at Jodrell Bank, the only telescope in the West able to track Sputnik.

More information about UK space activities can be found on the BNSC website, www.bnsc.gov.uk.



REPORT OF VIETNAM TO COPOUS SCIENCE & TECHNICAL SECTION - 2008

Introduction

Vietnam through the year 2007 is suffered from series of heavy disaster events such as typhoons, heavy rains, flash floods, land slides that killed many lives and destroyed thousands of houses, fish boats, aquafarms, roads, etc. Many big cities were under over 1m depth of water in decade's days. Government has to deliver rescued foods, clothes, medicament to habitants living on their tiled roof by helicopters.

Being aware of the importance of space technology in early warning of natural hazards and in disaster management, Vietnam has contributed efforts to develop and apply the space technology during these years.

On 14/06/2006 Vietnam Government has approved the "**Strategy for Space Technology Research and Applications until 2020**" in which on 20/11/2006 has established the Space Technology Institute (STI) under Vietnamese Academy of Science and Technology (VAST) and will establish the Vietnamese Commission for Space Research and Application (VSC) in 2008 that will manage and supervise the national programs as well as the international cooperation on space technology development and applications.

According to this **Strategy**, from 2006 - 2010 Vietnam has to accomplish following important tasks:

1. Forming and completing a legal frame for space technology research and applications.
 - Studying the international laws and regulations on space use and investigation on behalf of the national sovereignty.
 - Constructing and improving the general regulation documents for government agencies and branches relating to the space technology research and applications.
 - Forming and completing the regulation documents of store, management, development and use of the satellite images and derivative information such as: map, database, etc...



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- Constructing and promulgating the security regulations those refer to the National Independent Program for Space Technology Research and Applications
 - Constructing and promulgating the formatting standards and criteria for space technology research and applications to ensure the domestic and international compatibility.
2. Build the National Space Technology Infrastructure
- Building the Ground Receiving Station and Center for Satellite Image Database and Processing; receive the technology of Earth Observation Small Satellite and launch a small satellite; build the satellite GPS.
 - Deploying the Communication satellite VINASAT project.
 - Establishing a national key laboratory for space technology.
3. Promote the Research of Space Science and Technology
- Vietnamese Academy of Science and Technology (VAST) will preside to deploy the National Independent Program for Space Technology Research and Applications that will start from 2008. Its aim is to implement the following main tasks:
- Researching and building the Ground Receiving Stations.
 - Learning and receiving the small satellite technology.
 - Approaching some high - techs such as: the high - optical technology for observing, the satellite radar technology and the information satellite technology with high transfer rate.
 - Conducting the basic researches to develop the space technology.
 - Studying and making some ground devices and software's.
 - Until 2010 try to get the average level in the Region on Space Technology.
4. Promote the Space Technology Applications
- From 2006 - 2010, the space technology applications need to be strengthened in four main fields, such as *Communication, Hydrometeorology, Remote Sensing, and Positioning Satellite*. Until 2010, all these branches must use the space technology applications as a professional process with high effect, namely:



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- Post and Telecom, Broadcast and Television: Vietnam will expand the communication services in order to take full advantage of VINASAT satellite, develop the remote learning, medical examination, meeting and DTH Television.
- Hydrometeorology, Resources and Environment: It is necessary to improve the accuracy of typhoon, flash - flood, land - slides, and natural disaster forecasts, evaluate the impact of global climatic change on Vietnam, access the fluctuation of land areas in use periodically and build the database for digital maps sharing with both Central Government and locals.
- Agriculture, Aquiculture, Resources Investigation: in order to assist the forecasts in national rice production, flood, forest fire and drought, Vietnam also will further develop the remote sensing applications; expand the aquaculture planning, offshore fishing, oil and underground water detecting researches, etc...
- Transportation, National Defense and Security: Vietnam not only takes advantage of the VINASAT satellite capability, use the positioning technology broadly to navigate for road, airway and seaway, but also encourages the economic organizations to invest in applications and services of positioning and navigating technology.

Activities and Achievements

1. In 11/2007 the Vietnamese Ground Receiving Station (GRS) has completely built and started to put into operation. This GRS will provide satellite images SPOT, ENVISAT for natural resource and environmental management. This is the cooperative project between EADS Corp. (French) and MONRE (Vietnam).
2. The tentative schedule for launching the 1st Vietnam Communication Satellite VINASAT will be in 3/2008. This is the cooperative project between Lockheed Martin Corp. (USA) and VNPT (Vietnamese Ministry of Post and Telemetry). This satellite will provide the services for mobile, television and telemetry in Vietnam. VNPT plans to launch the 2nd satellite in 2011.
3. Vietnam is going to cooperate with EADS (French) to design and develop 01 small Earth Observation Satellite (weighted about 150kgs) namely VNRED-Sat for environmental research and disaster management. This project will be soon started



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when the financial budget available. Tentative schedule for launching this satellite is within the year 2011.

4. Vietnam is going to accomplish the National Independent Program for Space Technology Research and Applications that will be scheduled since 2008 - 2012.

5. In Hanoi, Vietnam from 5 - 9th, November, 2007, a Regional Workshop on "*Use of Space Technology for Forest Management and Environmental Protection*", was successfully co-hosted by the UN Office for Outer Space Affairs (UNOOSA), Ministry of Science and Technology of Vietnam (MOST) and the European Space Agency (ESA) and co-organized by Vietnamese Academy of Science and Technology (VAST), Ministry of Foreign Affairs (MOFA), Ministry of Natural Resources and Environment (MONRE) and Ministry of Agriculture and Rural Development (MARD).

The main goal of this workshop is to increase the related bodies, ministries, and branches' awareness of utilizing space technology in the environmental research and management, such as forest management, environmental security, prevention and reduction of the calamity influences. One of the main tasks of the "Strategy for Space Technology Research and Applications until 2020" is to utilize space technology in environment management and protection in Vietnam.

Vietnam has area of 331,690 km² in which the forest is occupied 126,639 km² area, that is 38.2% area of the country. The forest of Vietnam has various features, spreads all over country. In recent years, the uncontrolled logging and series of unwarmed forest fires have done a lot of critical damage to the environment and socio-economics of Vietnam, especially the deforestation results in landslide in the rainy season, has brought about the serious losses of men and equipments. To improve the quality and efficiency of forest management and environment protection and minimize the damage, Vietnam must strengthen ties with others countries in the world in order to exchange information, learning, technology, and development of the systems of environment management and calamity forecast.

This Workshop held in Vietnam is very important for creating a great opportunity for our managerial staff and scientist to learn and exchange the experience of international colleagues in the space technology applications for forest management and environment protection.



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During the workshop, the foreign and Vietnamese experts in remote sensing, images satellite processing, environment, resources, forestry, geology, etc jointly shared experience and discussed the following key issues:

- International, regional and national initiatives and experiences in the use of space technology for forest management and environmental monitoring.
- Case studies on successful application of space technology in forestry and environmental protection in the region.
- Space-related technologies and informational resources for addressing forest management, environmental sustainability and disaster management.
- Use of space technology for reducing impact/risk of deforestation, forest fire, land degradation.
- International cooperation, capacity building, education and training in the area of application of space technology for effective forest management and environmental protection in the region.

6. Vietnam is going to continue and strengthen the cooperation on Space Technology and Applications with many countries in the region as well as on over the world, such as JAXA - Japan, ESA - Europe, EADS, CNES – France, Belgium, Australia, COPOUS, etc. Especially with JAXA (Japan) the VAST has signed the Agreement for cooperation on Space Technology and Development including Satellite Technology, Remote Sensing Applications (Sentinel Asia Project), capacity building with various terms.

In the 14th Asia Pacific Regional Space Agency Forum (APRSAF-14) held in Bangalore, India from 21-23/11/2007, Vietnam has registered to take part in the “APRSAF Earth Observation Small Satellite Project” that will start from 2008-2013. In this meeting, Vietnam has been accepted as the host country for organization of the APRSAF-15 in 2008. This is very important and significant event and an opportunity for us in cooperation, exchange experience on Space Technology and Applications with international community.

7. For celebrating of the World Space Week from 4th - 10th October every year, especially this year 2007 is the “50th Space year”, Vietnam as a member of the United Nation had many activities to celebrate this significant event.

The Space Technology Institute (STI) of the Vietnamese Academy of Science and Technology (VAST) cooperated with UNESCO holding this event in Vietnam as well



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as activities of space education and awareness. It has been got the great supports and encourages from the government, press, schools and a large number of students all over the country.

The STI held a short - term training course to instruct the school pupils in making water rockets with parachute, explaining the principles of water boosted rocket launch and held a water boosted rocket competition for the pupils from secondary schools were held with many interesting categories, such as the trajectory category, the parachute category and the most beautiful water rocket with parachute.

Fore development of the children pupil creative, STI launched a poster contest with the theme “50th Space Year” and exhibition. STI chose the most beautiful paintings from many schools to take part in the poster contest in Bangalore, India from 21 - 25th, November, 2007. All the activities above were broadcasted on the Education Program of Vietnamese National Television to instruct how to make and simple way to launch the water rockets to children and school boys throughout the country and get the supports from the public.

Summary, Evaluation and Perspective

Although Space Technology has just been developing in Vietnam, but with the consideration and supports from Vietnamese Government, International cooperations and the attempt of the responsible agencies, Vietnam is serious about putting in place a good foundation for the development of Space technology.

At present, in Vietnam, the space technology has been initial steps in some domains, such as: Hydrometeorology (using the data from satellites: GMS, NOAA... to forecast weather, typhoon and calamities more accurately), Information and Communication (there are many ground stations constructed to serve television, telecommunication and the outstanding event is that the VINASAT project is being deployed), Remote Sensing (a remarkable event was LANDSAT and SPOT satellite images of the entire territory of Vietnam), Navigated by Satellite.

The guidelines of Vietnam in future are completing the national policy and legal frame for space technology research and applications; increasing the awareness of public and professional training the human resources about this field; constructing and improving the space technology infrastructure; incessantly expanding the international cooperation; mobilizing the budget, ODA capital and encouraging investment from different resources and private companies in this field.



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Especially, Vietnam also has many activities and policies (as reported above) on creating more opportunities and encouraging the youth to study about space science and technology.

In future, hopefully, the Vietnamese space technology is going to promote more and more and can reach to a relative regional level, effectively serving the socio - economic development, improving living quality, environmental and resources management, as well as national defense and security.