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Committee on the Peaceful Uses of Outer Space

International cooperation in the peaceful uses of outer space: activities of Member States

Note by the Secretariat

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I. Introduction

1. In the report on its fortieth 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.105/804, para. 21).

2. In the report on its forty-sixth session, the Committee endorsed the recommendation of the working group established to prepare a report for submission to the General Assembly at its fifty-ninth session for the review of the progress made in the implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), that the national reports to be prepared for the next session of the Subcommittee could focus on new mechanisms and initiatives implemented by member States in response to the recommendations of UNISPACE III.[1]

3. In a note verbale dated 24 July 2003, the Secretary-General invited Governments to submit their reports by 31 October 2003. The present note was prepared by the Secretariat on the basis of reports received from Member States in response to that invitation.

II. Replies received from Member States

Belarus

[Original: Russian]

1. The State policy of the Republic of Belarus with regard to space activities is established by the National Space Council on the basis of national interests and the need to carry out national economic and government work effectively using space information.

2. In recent years, mindful of the increasingly important role played by space technologies in global technical progress, Belarus has also been working more actively on space matters. In 2002, the joint Belarus/Russian Federation Cosmos-BR programme, intended to develop technologies for using remote Earth sensing and satellite navigation information for various ecological and national economic purposes, was completed. A new space information-receiving station developed under the programme was set up in the city of Minsk.

3. In 2003, the National Academy of Sciences of Belarus developed the concept of the Belarusian space system for remote Earth sensing. This concept was developed on the basis of an analysis of developments in space activities in countries around the world, the scientific and industrial potential of the Republic of Belarus and the need to develop space information technologies for economic and social purposes in Belarus.

4. A plan for setting up the system has been put forward. It is proposed that the system include both a ground segment and a space segment.

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[1] *Official Records of the General Assembly, Fifty-eighth Session, Supplement No. 20* (A/58/20), para. 52 and annex I, para. 16.

5. It is proposed that the ground segment of the system encompass (at the information level) the resources currently available in Belarus for the reception, storage and processing of remote Earth sensing satellite information, the establishment of systems and packages not yet available and the development of the functional potential of existing technical, programme and information resources for remote Earth sensing.

6. With a view to receiving high-resolution remote Earth sensing information, which is not currently received in Belarus, and using it effectively to serve the country's interests, the space segment of the system should include the Belarusian remote Earth sensing spacecraft BelKA, which will be made by Russian Aviation and Space Agency companies, with the participation of Belarusian companies.

7. The strategic aim of the project is to create modern applications, based on extensive use of data derived from remote Earth sensing and geographical information technologies, and to make use of such applications in the daily business of state administration and economic activity.

8. If the project for the creation and operation of the system is successful, Belarus will be able to enter the international market for high-resolution remote Earth sensing data and expand its potential on the international market for equipment for remote sensing of the Earth from space and on the market for geographical information technologies and systems.

9. In 2003, work was also undertaken in Belarus to set up the new Belarus/Russian Federation Cosmos-SG programme, which is a logical continuation of the Cosmos-BR programme.

10. The proposed objectives of the new programme are as follows:

(a) Development of elements of a single system for supplying Russian and Belarusian users with remote Earth sensing information;

(b) Development of technology and instruments for remote Earth sensing microsatellites;

(c) Creation of new instruments for environmental purposes, including measurement of the ozone layer in the Earth's atmosphere, research into atmospheric luminescence as an earthquake predictor and so on;

(d) Creation and development of the ground segment of the inter-State navigation information system.

11. The Cosmos-SG programme should be implemented in 2004-2007.

12. Once the work plan for the Belarus/Russian Federation programme and for the creation of the ground segment of the Belarusian space system for remote Earth sensing and the Belarusian satellite has been finalized, the National Space Council plans to prepare and publish a brochure in 2004 on the achievements of Belarusian companies in the field of space methods and technologies.

Brazil

[Original: English]

1. Since the inception of its space activities 40 years ago, Brazil has been firmly motivated by peaceful purposes and has oriented its initiatives towards applications that meet society's needs and demands.

2. Involvement in space activities is crucial to Brazil because of the geographical characteristics of the country, which include the impressive extent of its territory and coastline, its huge Amazonian forest and the large expanses of scarcely populated areas, and the diversity of its climate. In particular, applications in the field of satellite remote sensing have proved to be of great usefulness to the country.

3. The Brazilian space programme has chosen, from the beginning, to invest in data-collection satellites, which since the 1990s have gained popularity worldwide for their very low cost-benefit rate.

4. The data-collection satellite SCD-2, launched in 1998 by a Pegasus launcher, is the second in a series of satellites conceived to receive meteorological and environmental data, as well as rainfall and river water level data collected at and transmitted from hundreds of fixed automatic surface platforms settled on land and in oceanic buoys and to retransmit the data to ground receiving stations.

5. The SCD-2 is a 115-kilogram, low-complexity satellite flying in an orbit at an altitude of 750 kilometres. Designed for a minimum lifetime of two years, it is still operating perfectly after five years.

6. A data collection function has been included in the China/Brazil Earth Resources Satellite (CBERS) series and will be part of future Brazilian remote sensing satellites.

7. The multi-mission platform (MMP) was conceived as a versatile platform to be used in several application satellite missions of the Brazilian space programme. The MMP will provide three-axis stabilization with fine point accuracy to low-Earth orbit (LEO) satellites and was designed to be compatible with a large variety of existing small and medium-size launchers. Modules of the MMP are under development. The first satellite to use the MMP would be the Remote Sensing Satellite (SSR-1), an equatorial mission to monitor the Amazon region.

8. Brazil is developing the satellite launch vehicle VLS-1, classified as a small satellite launch vehicle. The trials for qualification in flight have so far not been successful.

9. On 22 August 2003, a tragic accident occurred a few days before the launch of the third prototype, which resulted in the death of 21 technicians. The Government of Brazil announced that the VLS programme would continue and the next launch is scheduled to take place within three years.

10. International cooperation has been a vital component in the planning and implementation of Brazilian space activities. Since the early 1960s, the Government has placed special emphasis on promoting international contacts and strengthening the cooperation with traditional partners, such as Argentina, France, Germany, the United States of America and the European Space Agency (ESA), as well as with new ones, such as China, India, the Russian Federation and Ukraine.

11. On 21 October 2003, CBERS-2 was successfully launched from Taiyuan, China. On 14 October 1999, the first satellite, CBERS-1, was also launched successfully from China. This bilateral collaboration began in July 1988, when Brazil and China signed a cooperation agreement to develop two remote sensing satellites.

12. With a broad set of spectral bands, image-collecting frequencies and spatial resolutions, the CBERS satellites carry three different sensors: the wide field imager (WFI), the multispectral charge-coupled device (CCD) camera, the infrared multispectral sensor (IR-MSS) and an environmental data collecting system to gather data from the ground.

13. The WFI has a ground swath of 890 kilometres (km), which provides a synoptic view with a spatial resolution of 260 metres (m). The entire surface of the Earth is covered in approximately five days.

14. The multispectral CCD camera provides images of a 113-km strip with a 20-m spatial resolution. Since the camera has a sideways pointing capability of ± 32 degrees, it is capable of taking stereoscopic images of a certain region. In addition, any phenomenon detected by the WFI may be zoomed in by the oblique view of the CCD camera with a maximum time lag of three days.

15. The IR-MSS operates in four spectral bands, thus extending CBERS' spectral coverage up to the thermal infrared range. It captures images of a 120-km swath with the resolution of 80 m (160 m in the thermal channel). In 26 days, one obtains a complete coverage of Earth that can be correlated with the images of the CCD camera.

16. During its active life, CBERS-1 has produced more than 600,000 images of the Earth's surface, collected by ground stations in Brazil and China.

17. The utilization of these images has been of great importance to both Governments' policies. The images have been used continuously to enhance knowledge of large-scale phenomena on the Earth's surface, such as the Amazon region.

18. Another agreement was signed in November 2002 concerning the joint development of two more advanced remote sensing satellites, CBERS-3 and CBERS-4.

19. Brazilian participation in the programme will be increased by up to 50 per cent, thus taking Brazil to a position of equality with its partner. CBERS-3 will be launched in 2008 and CBERS-4 in 2010. The Brazilian share in CBERS-1 and CBERS-2 is 30 per cent.

20. CBERS-3 and CBERS-4 represent an evolution from CBERS-1 and CBERS-2. Four cameras will be present in the payload module, with improved geometrical and radiometric performance. These cameras are the PanMux camera (PANMUX), the multispectral camera (MUXCAM), the scanning medium-resolution scanner (IRSCAM) and the wide field imaging camera (WFICAM).

21. On 21 October 2003, the Government of Brazil and the Government of Ukraine signed an agreement in Brasilia for the launch of the Ukrainian launch vehicle Cyclone-4 from the Alcantara Launch Centre in Brazil. The main purpose of the agreement is the development of the Cyclone-4 launch site at the Alcantara

Launch Centre and the provision of launch services for the national space programmes of both countries and their commercial customers. The international instrument creates an international entity, Alcantara Cyclone Space, to operate the launch of Cyclone-4.

22. Since 2002, the Brazilian Space Agency (AEB) and the National Aeronautics and Space Administration of the United States of America have been holding negotiations to reach a new agreement on the hardware and services to be delivered by Brazil to the International Space Station and the utilization rights to be obtained, in order to review an implementing arrangement signed between the Government of Brazil and the Government of the United States in 1997.

23. The Brazilian Space Programme attaches special attention to research and development activities aimed at fostering, coordinating and supporting projects and initiatives directed at basic and applied research.

24. The microgravity project of AEB was approved in the meeting of the Agency's High Council on 2 October 1998 (CSP 24/98, resolution No. 36 of 27 October 1998), with the aim of promoting the development and accomplishment of scientific and technological experiments in a microgravity environment, using several available means, including sounding rockets, space shuttles and the International Space Station, on which Brazil is a payload participant.

25. The Brazilian programme of sounding rockets provides for their utilization for microgravity experiments with the aim of stimulating interest in and informing the academic community and other interested persons about the microgravity project. The launches occur from one of the Brazilian operational launch centres, the Barreiro do Inferno Launch Centre in Natal or the Alcantara Launch Centre in Alcantara, Maranhao.

26. Brazil's research activities relating to space debris are described in detail in document A/AC.105/817.

27. Regarding satellite meteorology activities, the Brazilian Center for Weather Forecasts and Climate Studies (CPTEC) has received station facilities for the Geostationary Operational Environmental Satellite (GOES), Meteosat, satellites of the National Oceanic and Atmospheric Administration of the United States and the Terra and Aqua satellites. The CPTEC team has been continuously involved in the development of new products to meet socio-economic needs. For instance, the following products have recently been improved, adapted or developed:

(a) Convective system tracking and forecast using GOES satellite images. This new methodology, developed entirely in Brazil, is based on cloud area expansion. It is very useful for short-range forecasting, convection diagnostics and to provide information about precipitation;

(b) Products to respond to the growing scientific, technical, administrative and political interest in monitoring vegetation fires and burning of biomass and their environmental effects;

(c) Cloud track winds and atmospheric sounding, products that produce valuable information concerning the vertical structure of the atmosphere. A knowledge of the vertical distribution of temperature, humidity and wind makes for

improved weather forecasting and diagnostic studies of a region. CPTEC has different retrieval models using different satellite data;

(d) Ultraviolet (UV) index forecasts are currently being developed. The UV index will be calculated by means of a UV spectral model, based on the two-flux method to solve the radiative transfer equation. The main purpose of the model is to gather the necessary tools for theoretical UV calculations for different atmospheric, temporal and geographical conditions;

(e) Forecasts of concentrations of gases and aerosols resulting from burning of biomass over South America and Africa. CPTEC has developed an atmospheric transport model for products of the burning of biomass.

Indonesia

[Original: English]

1. Space technology applications

1. The main areas of space technology applications other than space communications are satellite remote sensing (Earth observation and environment monitoring), geographic information systems (GIS) and global navigation and positioning satellite systems (GPS and GNSS). Over the last two years, various organizations, including government research institutes, universities and organizations from both industry and the private sector, have continuously expanded their activities related to space technology applications. Activities related to space communication services are now undertaken mainly by the private sector.

2. The National Institute of Aeronautics and Space (LAPAN) of Indonesia, as the national focal point for space research and development, has played and continues to play a pivotal role in promoting the use of satellite remote sensing technology in the country. LAPAN scientists have carried out a large number of research and demonstration projects addressing a wide variety of resource and environmental problems using satellite remote sensing and GIS technologies. Simultaneously, thanks to its satellite ground station, which was upgraded in 1993, LAPAN regularly provides satellite remote sensing data, as well as analysis and interpretation services, to many national user agencies.

3. By 2002, Indonesia had installed six ground stations for the purpose of application of GPS, which is of much benefit to the country in, among other things: (a) maintaining a national geodetic base; (b) contributing to surveys and mapping by providing geo-spatial references; and (c) monitoring movement of active tectonic plates, degradation of the Earth's surface, climate change, sea surface change and topographical conditions.

2. Space science and climate research

4. Activities related to space science and climate research are aimed mainly at: (a) developing an Indonesian climate model; and (b) understanding the natural phenomena and specifications of the atmosphere and ionosphere/upper atmosphere in relation to environmental conditions on Earth. In order to enhance capability in acquiring data on atmospheric phenomena over the equatorial region, LAPAN, in cooperation with Kyoto University of Japan, has been operating meteorological

instruments in Koktotabang, West Sumatra (0.20° S 100.32° E), known as the equatorial atmosphere radar. This radar has been in commission since 2001.

3. Development of space technology

5. Regarding the development of space technology, Indonesia began to develop satellite technology through LAPAN. Starting in 2000, LAPAN developed a receiving ground station for LEO satellites. In the following year, the Institute developed a microsatellite-engineering model, namely LAPSAT-1 EM, which is able to demonstrate the satellite operation of store and forward communication. In 2002, LAPAN continued to develop the microsatellite engineering model through LAPSAT-2 EM, which is used to demonstrate a remote sensing satellite operation. In July of 2003, LAPAN and the Technical University of Berlin signed a memorandum of understanding to develop the first Indonesian microsatellite, LAPAN-TUBSAT. This programme provides an opportunity for Indonesian engineers to master satellite building stages, ranging from designing, implementing, testing and launching to operating the satellite. LAPAN-TUBSAT will carry a remote sensing and store and forward communication payload and will be launched in 2005. The next programme is to develop a remote sensing microsatellite to support national food security. It will be built in collaboration with the German Aerospace Center (DLR) and its launch is planned for 2008.

6. Indonesia realizes that cooperation with countries having capabilities in space technology will accelerate mastery of space technology by Indonesia. In that context, the memorandum of understanding between LAPAN and the Indian Space Research Organization on cooperation in the field of space research technology and development and the memorandum of intent between LAPAN and the Russian Aviation and Space Agency were signed in New Delhi in 2002 and in Moscow in 2003, respectively. In future, Indonesia will continue to widen its cooperation with other countries based on the principles of mutual benefit and peaceful purposes.

4. Space policy

7. In line with its commitment to the use of space for peaceful purposes and the necessity of cooperation among countries in space efforts, Indonesia has ratified the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI)) based on National Act No. 16 of 2002. At the national level, the National Council of Aeronautics and Space of the Republic of Indonesia (DEPANRI), for which LAPAN is the secretariat, is now preparing a national aerospace congress, to be held in December 2003 and aimed at drawing up a national strategic policy on space for 2005-2009.

Iran (Islamic Republic of)

[Original: English]

1. Introduction

1. For managing the country well and using its resources and potential for improvement and sustainable development, the authorities in the Islamic Republic of Iran pay great attention to the use of a variety of efficient, modern and economic tools to support its plans for the above-mentioned purposes.

2. The goals that the Islamic Republic of Iran aims to achieve by using space science and technology are described in full in the note by the Secretariat of 2 December 2002 (A/AC.105/788).

2. Institutionalization of space activities

3. Based on the activities carried out during the last three decades in different agencies, the establishment of a national body with the aims of policy-making, planning, budgeting, research, development and coordination of ongoing activities in different organizations within the country will soon be achieved. In April 2003, the Parliament of the Islamic Republic of Iran approved a bill for the establishment of the Iranian National Space Agency (ISA). Following that approval, which was the result of a 25-year effort, the Iranian Remote Sensing Centre (IRSC), affiliated with the Ministry of Telecommunications and Information Technology, was given the task of preparing draft bylaws and regulations for the Supreme Space Council and ISA. Pursuant to that plan of work, IRSC commissioned a working team to prepare the drafts. The team prepared and submitted both drafts to IRSC, after the needed studies, investigations and consultations. The Centre organized continuous meetings of the Advisory Committee on Space Issues, consisting of specialists, experts and scientists well versed in space technology applications, to discuss the drafts in detail. In the meantime, the Advisory Committee solicited the advice and guidance, as well as the experience, of organizations and experts at the national and international levels. The revised drafts were recently presented to the State Board for final approval and it is hoped that ISA will be established in the very near future.

4. Once established, ISA will cover and support all the activities in the Islamic Republic of Iran concerning the peaceful applications of space science and technology. According to the bill establishing the Agency:

> “Aiming to apply space technology and peaceful uses of outer space, and protecting national interests and sustained exploitation of space science and technology for economic, cultural, scientific and technical development of the country, the Supreme Space Council with the leadership of the President is being established. The Council’s goals include:
>
> “(a) Policy-making for the application of space technologies aimed at the peaceful uses of outer space;
>
> “(b) Policy-making in manufacturing, launching and use of national and research satellites;
>
> “(c) Approving the space-related programmes of state and private institutions and organizations;

"(d) Approving the long- and short-term programmes of the country's space sector;

"(e) Promoting partnership between the private and cooperative sectors in efficient uses of space; and

"(f) Developing guidelines concerning regional and international cooperation in space issues and clarifying the position of the Islamic Republic of Iran to the above-mentioned bodies."

5. The secretariat of the Supreme Space Council will be based in ISA and the Director of ISA will act as the secretary of the Council.

3. Capacity-building and technology transfer

6. Aiming to develop infrastructure for the application of space science and technologies in the country, the Islamic Republic of Iran continues its work by providing opportunities for in-depth education in space science and technology applications in the country. At present, a considerable number of courses on the applications of space science and technology have been included in the education programme of different universities throughout the country at the postgraduate level. Subjects covered include satellite communications, remote sensing and geo-information systems, satellite meteorology, atmospheric and space studies, space engineering and so on. While efforts in this area are being carried out continuously, the object of establishing a specialized centre dedicated solely to in-depth and short- as well as medium-term education in space science and technology applications based on approved international standards is being followed up in parallel.

7. The Islamic Republic of Iran supports the idea of establishing a centre for space science and technology education of Iran as a node for the network of centres for space science and technology education in Asia and the Pacific. As a first step, the bi-weekly courses on satellite communications and remote sensing, GIS and standard positioning systems (SPS) have been planned and will it is hoped be active soon. In the meantime, the Islamic Republic of Iran is interested and ready to join the Board of Governors of the Centre for Space Science and Technology Education in Asia and the Pacific, based in India.

8. Furthermore, the Islamic Republic of Iran is earnestly interested to host different seminars, workshops and symposiums on the applications of space science and technology. The United Nations/Islamic Republic of Iran Workshop on the Applications of Space Science and Technology for Disaster Management, focusing on Sustainable Development and Environmental Protection, is scheduled to be held in Tehran in May 2004. In addition, the Islamic Republic of Iran will jointly hold the International Seminar on Satellite Technology Applications in Communications and Remote Sensing, with the Inter-Islamic Network on Space Sciences and Technology (ISNET), in Tehran from 9 to 15 October 2004.

9. World Space Week ceremonies are held yearly from 4 to 10 October. This occasion is appropriate for capacity-building for space science and technology applications in the Iranian community and activities have been very well received by the public and by specialists in the field. The attention of the young generation to World Space Week ceremonies and programmes is considerable. In 2003, members of the public, specialists and scientists attended the ceremonies of the fourth World

Space Week. Many activities were scheduled to celebrate the event, including contests, seminars, exhibitions, interviews, publications and media activities.

4. Development of space science and technology

10. The Islamic Republic of Iran's activities in space science and technology development are described in full in the note by the Secretariat of 2 December 2002 (A/AC.105/788).

5. Development of space technology applications

11. Application of space science and technology in the Islamic Republic of Iran started in 1970 with membership in the International Telecommunications Satellite Organization (Intelsat) and the installation and use of the Standard-A Station in Asad Abad, in Hamedan Province. The development of different applications of space science and technology has caused increasing attention by the authorities of organizations and institutions. This has led to the idea of establishing an organization to cover all space-related activities and issues in the country.

12. The Islamic Republic of Iran's activities in natural resource monitoring and geomatics, satellite communications and broadcasting, satellite meteorology and natural disaster monitoring are described in full in the note by the Secretariat of 2 December 2002 (A/AC.105/788).

6. International and regional cooperation

13. As evidence of its willingness to participate in worldwide and regional collaboration and to fulfil its obligations to international and regional bodies, the Islamic Republic of Iran not only acts as a member of several international agencies, such as the Committee on Space Research (COSPAR), the International Society for Photogrammetry and Remote Sensing, the Asian Association on Remote Sensing, the International Telecommunication Union, the World Meteorological Organization, the Food and Agriculture Organization of the United Nations and other bodies and programmes affiliated with the United Nations, but also maintains very close cooperation with the Regional Space Applications Programme for Sustainable Development of the Economic and Social Commission for Asia and the Pacific. In addition, the Islamic Republic of Iran is an active member of Asia-Pacific Multilateral Cooperation in Space Technology and Application and many other regional and international societies, institutions and projects. At the international level, the Islamic Republic of Iran has achieved good success recently, especially in cooperating with the Office for Outer Space Affairs. These achievements include membership in the bureau of the Committee on the Peaceful Uses of Outer Space and active participation in the implementation of the recommendations of UNISPACE III.

(a) Membership in the bureau of the Committee on the Peaceful Uses of Outer Space

14. Based on the agreement on the composition of the bureaux of the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies, the Islamic Republic of Iran would assume the position of the Second Vice-Chairman/Rapporteur of the Committee for the next term, from 2004 to 2005.

(b) Implementation of the recommendations of UNISPACE III

15. Space technology emerges as a vital and important tool for development at both the national and the international levels. It has led to advances in various fields of activities in the Islamic Republic of Iran, from management and control of natural disasters to navigation, and from monitoring of natural resources and the environment to telemedicine and tele-education. Following UNISPACE III, which identified all these possibilities and the potential of space science and technology, countries have had an opportunity to work together for the implementation of its aims. It is believed that the recommendations of UNISPACE III can lead to achieving objectives set by the United Nations and supporting major initiatives being undertaken to promote human development. In that direction, the Islamic Republic of Iran participates in the activities of the action teams to implement the recommendations of UNISPACE III as a member and, in particular, co-chairs the Action Team on Environmental Monitoring Strategy, jointly with the Syrian Arab Republic and the Russian Federation, to develop a comprehensive worldwide environmental monitoring strategy.

16. The Action Team follows its aims and tasks in an orderly manner and will organize its sixth meeting during the forty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, to be held in Vienna from 16 to 27 February 2004. The Action Team will submit its draft report to the Subcommittee by the end of November 2003.

17. In addition to participating in the work of the Action Team on Environmental Monitoring Strategy, the Islamic Republic of Iran is a member of the Action Team on the Management of Natural Resources, the Action Team on Weather and Climate Forecasting, the Action Team on Public Health, the Action Team on Disaster Management, the Action Team on Knowledge-Sharing, the Action Team on Global Navigation and Positioning Systems, the Action Team on Sustainable Development, the Action Team on Near-Earth Objects and the Action Team on Increasing Awareness.

Norway

[Original: English]

The 2002 Annual Report of the Norwegian Space Centre (Norsk Romsenter, Oslo) will be distributed during the forty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, to be held in Vienna from 16 to 27 February 2004.

Peru

[Original: Spanish]

1. The National Aerospace Research and Development Commission of Peru (CONIDA) is undergoing a process of restructuring, since it has become apparent that, in recent years, notwithstanding the signing of a number of international agreements aimed at international cooperation in the peaceful uses of outer space, in none of those cases has international cooperation actually materialized. Consequently, the work of the new administration is focusing on the reactivation of

earlier agreements that are still in force, as is the case with India and the Russian Federation, and to approach other Member States, namely Argentina, Brazil and Chile, with the same end in view.

2. CONIDA has held an informal exploratory meeting with India, through its Embassy, with a view to reactivating the memorandum of understanding signed with the Indian Space Research Organization (ISRO), which expired on 30 April 2003. An agreement was reached to hold a further coordination meeting in the near future, at a date to be fixed by the Indian Embassy.

3. Two informal meetings have been held with the Russian Federation, through its Embassy, with the aim of reviving the memorandum of understanding signed by the Russian Aviation and Space Agency (in force) and reactivating the Convention on Scientific, Technological and Educational Cooperation (in force), signed by the Tsiolkovsky State Technological and Aerospace University (MATI).

4. In the course of a series of talks held with the supreme commands of the different air forces in Latin America, CONIDA has made contact with the Chile Space Agency. An agreement was reached that a delegation of CONIDA officials would be received in Santiago during the first quarter of 2004 for the purpose of visiting the installations of the Chile Space Agency and exchanging views on opportunities for mutual cooperation in the peaceful uses of outer space.

5. CONIDA has contacted the National Commission for Space Activities (CONAE) in Argentina, which has indicated its willingness to visit Lima with a delegation of Argentine professionals in order to strengthen ties of mutual cooperation on scientific and technological subjects relating to the peaceful uses of outer space.

6. Following discussions with a representative of the Institute of Aeronautics and Space at the Aerospace Technology Centre in Brazil on the occasion of his visit to CONIDA, a letter of presentation was addressed to the Brazilian Space Agency (AEB), expressing CONIDA's wish to discuss the possibility of concluding agreements on mutual cooperation in space matters.

7. Owing to budgetary constraints, CONIDA was unable to attend the working meetings of the drafting group for the convention on the establishment of an Asia-Pacific space cooperation organization, held in Thailand from 4 to 8 August 2003. However, CONIDA considers its participation of the utmost importance as a means of bringing Peru closer to the international aerospace science community and the establishment of the cooperation necessary to enable it to initiate aerospace research and development activities in Peru in areas related to the peaceful uses of outer space.

Sweden

[Original: English]

1. Introduction

1. Development and coordination of space activities in Sweden has been entrusted to the governmental agency, the Swedish National Space Board (SNSB), under the Ministry of Industry, Employment and Communications.

2. The main goals for the Swedish space programme are to retain and develop to the highest level acquired expertise in various fields of activity and to make Sweden a worthwhile and competent partner in international scientific and industrial cooperation.

3. Key programme areas are magnetospheric and ionospheric research, astronomical studies, remote sensing, observation of the Earth's atmosphere and environment and specialized industrial competence, including development of small cost-efficient satellites.

4. Publicly funded space activities in Sweden are mostly (about 80 per cent) carried out in international cooperation, mainly through ESA, and through bilateral cooperation.

2. Programmes

(a) Science

Space research programme

5. The Swedish space research programme comprises publicly financed basic research activities, which use sounding rockets, balloons and satellites for their experiments. The main areas of the programme are classical space research and research in microgravity.

6. Space research encompasses large areas of modern physics, such as astronomy, plasma physics, atmospheric physics, material physics, biophysics and fundamental physics.

Fundamental space research

7. Sweden has been able to keep pace with other industrialized countries when it comes to fundamental space research by concentrating resources in those areas where Sweden has excellent scientific competence and where its geographical location presents specific advantages. This is the case, for example, in space plasma physics, where Sweden has a long research tradition and outstanding scientists and where the location of the space research range, Esrange, in the northern auroral zone (latitude 68º N) gives a clear advantage.

8. Esrange and the scientific environment that has developed in Kiruna constitute a valuable resource. Scientists from all over the world gather here to work on joint projects. This implies a fruitful exchange of ideas in the very front line of basic research. It also means that Swedish space research is the subject of continuous assessment and quality control in an international context. The series of small cost-efficient scientific satellites such as Viking, Freja, Astrid 1, Astrid 2 and Odin, as well as the launching of sounding rockets and balloons, constitute the backbone of the Swedish national space research programme.

9. Research activities using sounding rockets and balloons at Esrange, as well as ESA space missions, are initiated and carried out by the research teams in the areas of plasma physics, astronomy, atmospheric chemistry and material sciences.

Space plasma physics

10. Space plasma physics is an area with a long scientific tradition in Sweden and an area where scientific results in the ultimate front line of research can be obtained with relatively small satellites. The reason for this is that the basic research is at present concentrated on specific physical processes in near space. Dedicated instruments and orbits are, however, necessary. One example of such a scientific satellite is the very successful Viking, which became Sweden's first satellite and was launched in 1986 with the auroral zone as the "mission target". The successors, Freja, Astrid 1 and Astrid 2, were launched in 1992, 1995 and 1998, respectively. A 6-kg nano-satellite for space plasma measurements, Munin, was developed by the Swedish Institute of Space Physics and launched in November 2000 and operated for 53 days.

Astronomy and aeronomy

11. A combined astronomy and aeronomy satellite mission, Odin, was launched in February 2001 from Svobodny, Russian Federation. The operational lifetime was estimated at two years, but the present plan assures continued operation throughout 2003. Odin is a project carried out in cooperation with Canada, Finland and France. The astronomical part of the mission concerns studies of the interstellar medium and the star formation process using heterodyne receivers for sub-millimetre and millimetre wavelengths. The Odin satellite provides data on the Earth's atmosphere in a polar orbit, thereby optimizing the possibilities to study the polar regions where ozone depletion is most pronounced.

(b) Microgravity research

12. Technical development and experiments in microgravity by means of sounding rockets have been carried out in Sweden (Esrange) since 1977. The latest powerful rocket, MAXUS, has been developed in cooperation with Germany and offers about 15 minutes in microgravity compared with the 6 minutes possible with other rockets.

13. From the very beginning, the Swedish experiments have been directed towards material physics. The experiments deal with processes of solidification, convection, diffusion and crystallization, with the aim, inter alia, of gaining a deeper understanding of various transport mechanisms in a melt. Materials being studied are metals, alloys, semiconductors and metal-ceramic composites.

Life sciences

14. By tradition, Sweden has played a role in the life sciences, for example in its study of the effects of microgravity on the cardiovascular and lung function, on the balance organ and on the central nervous system, the loss of calcium in the skeleton, on hormonal and other mechanisms for regulation of the fluid balance, as well as on immune defence and the formation of blood.

(c) Earth observation

15. The Swedish remote sensing activities are mainly carried out within the framework of ESA programmes, in bilateral cooperation (primarily the Satellite pour l'observation de la Terre (SPOT) with France) and within the European

Commission. The main goals for Sweden's Earth observation activities are to support research and technology, to secure the continuity of global data and to promote the use of information from satellites for societal applications.

16. SNSB funding of Swedish research and development activities in the area of Earth observation includes financial support to research groups, for method and technique development and to users who intend to start or expand the use of remote sensing data. Research is carried out in areas such as forestry, global monitoring, climate change, meteorology, geodesy and atmospheric physics. At the moment, global monitoring and activities linked to the European Global Monitoring for Environment and Security (GMES) initiative have high priority within the Swedish remote sensing programme.

17. From 1997 to 2002, Sweden also had a large research programme called Remote Sensing for the Environment, supported by the Foundation for Strategic Environmental Research (MISTRA) and managed by Metria (a division of the Swedish surveying authority, Lantmäteriet). The main goal of the programme was to develop operational remote sensing methods. Some of the projects are still ongoing within a smaller programme funded by MISTRA, together with the different participating remote sensing users.

18. The use of remote sensing data is steadily expanding, especially within governmental organizations. The Swedish Meteorological and Hydrological Institute (SMHI) is one of the main remote sensing users in Sweden and the Institute has contributed significantly to the development of forecasting services by using and processing data from both polar and geostationary weather satellites.

19. The Swedish National Board of Forestry is another major remote sensing user. The Board uses SPOT and Land Remote Sensing Satellite (LANDSAT) data in a GIS-based forest support system. Since 1999, national coverages with SPOT or LANDSAT data have been purchased yearly. The satellite images are used in each of the 100 local offices. This means that more than 500 people use the data, for example to check if felling is actually carried out according to what has been reported to the Board.

20. Sweden participates in the SPOT programme, together with Belgium and France. SPOT consists of a series of five Earth observation satellites that were launched between 1986 and 2002. Important applications of SPOT imagery lie in the areas of mapping, telecommunications, forest management, agriculture, environmental monitoring, geology and planning. On board SPOT 4 and 5 is also the VEGETATION instrument, which is a sensor developed jointly by the European Commission, Belgium, France, Italy and Sweden. The VEGETATION system enables daily and global monitoring of the entire continental biosphere and crops.

21. Esrange, near Kiruna, is in all likelihood the world's busiest Earth observation ground station. Thanks to its position at a high northern latitude, Esrange is particularly well suited to receive data from and to track and control satellites in polar orbit and it supports many Earth observation satellites in polar orbit, such as LANDSAT and SPOT. The Swedish Space Corporation also has an X-band ground station near Malmö in southern Sweden. This gives Sweden the capability of complete coverage of all of Europe from Earth observation satellites in direct reception mode.

(d) Transfer of knowledge: remote sensing courses and projects

22. Sweden has broad experience of remote sensing and GIS in governmental agencies, universities and companies.

23. This experience and know-how can be made available to developing countries where there is need for mapping and other forms of remote sensing applications. There is thus an increasing demand for technology transfer in the form of training of personnel from developing countries. To meet that demand is one of the recommendations of UNISPACE III.

24. Annual United Nations international training courses on remote sensing education for educators started in Sweden in 1990 and are hosted by the Government of Sweden. The courses are organized by the Department of Physical Geography and Quaternary Geology of Stockholm University. The main objectives of the course are to develop the practical knowledge and skills of educators from developing countries in remote sensing technology and to equip them with the skills needed to introduce the discipline into the educational programmes in their own countries. The course is six weeks long, admits 25 participants and is targeted at educators from developing countries with a minimum of three years' teaching experience at a university or technical college.

25. As mentioned earlier, SNSB sponsors cooperation projects with the purpose of promoting the use of information from satellites for societal applications. Those projects also make it possible for organizations of the United Nations system and for developing countries to increase their use and knowledge of remote sensing technologies. One such example is a project managed by Metria, where remote sensing data are used to produce support for efficient and cost-effective planning and management of refugee camps. Detailed maps of camp infrastructure, thematic maps and digital elevation models are produced from high-resolution satellite images. The project is being carried out in close cooperation with the Office of the United Nations High Commissioner for Refugees (UNHCR). UNHCR is steadily increasing its use of remote sensing data. In connection with the project, the Swedish International Development Cooperation Agency is planning to finance a Junior Programme Officer (JPO) at UNHCR in Geneva in the area of remote sensing for a period of three years.

(e) Industrial development

26. Development of space activities requires technical development and an industrial organization. A major goal of Swedish space activities is to contribute to long-term development of the Swedish space industry. The activities in the field of science and applications also constitute a driving force for the development of industrial competence.

27. Development of small, low-cost satellites is a suitable working area for Swedish space companies and can also be seen as a gateway to space activities for smaller companies. The low-cost short-term profile represented by the Viking, Freja and Odin scientific satellites is an important complement to the more expensive and long-term projects of ESA and of the large spacefaring nations.

28. There are three main space companies in Sweden:

(a) *The Swedish Space Corporation* (SSC), which is a government-owned, limited company under the Ministry of Industry, Employment and Communications. Its activities cover the entire range of space-related work from feasibility studies to operational applications of space technology. Systems engineering and management are typical of the company's activities, but SSC also designs and develops high-technology hardware in-house, especially for use in space vehicles and in satellite ground stations. SSC also offers a complete remote sensing programme. SSC has a long and successful tradition of international cooperation in all areas of its business. SSC operates Esrange;

(b) *Saab Ericsson Space AB* works in the following fields of activity: spacecraft systems, computers and data handling, sensor system mechanisms, spacecraft structures, flight control systems for sounding rockets, microgravity payloads, small satellites, microwave antennas, microwave electronics and fibre optics. The most well-known computer is the one used on board the Ariane launcher, which, based on information from the guidance and navigation system, computes the necessary corrections, initiates the separation sequences of the three rocket stages and the satellite and so on. The company has supplied on-board computers to all Ariane launchers since the first launch in 1979;

(c) *Volvo Aero Corporation* is involved in the development and production of combustion chambers and nozzles for Viking (Ariane 4), development and production of nozzle and turbines for Vulcain (Ariane 5), technology programme in pump systems, nozzles and combustion. Volvo Aero has participated in the Ariane launcher project since the beginning of the 1970s.

3. Kiruna: a Swedish space centre

29. Kiruna's geographical location in the auroral zone and near the North Pole has constituted a natural resource for conducting space activities, inter alia, for space research and for operating satellites in polar orbits, scientific satellites and Earth observation satellites.

30. The Swedish Institute of Space Physics (IRF) was established in Kiruna in 1957. The primary task of the Institute is to carry out basic research, education and associated observatory activities in space physics. IRF is also an affiliate of the International Space University.

31. Esrange, the space research range situated north of the Arctic Circle at a latitude of about 68° N, was established in the early 1960s and has been operated by SSC since 1972. Esrange's geographical location, at high latitude, makes studies of the aurora and other high-latitude phenomena of particular interest.

32. Furthermore, the possibility for land recovery makes Esrange very suitable for all sounding rocket experiments needing recovery, for instance for microgravity research. Payloads are normally recovered by helicopter within one hour from launch. The sounding rocket activities at Esrange are carried out as a special ESA project with France, Germany, Norway, Sweden and Switzerland as participating States. Esrange has the capacity to launch most types of sounding rocket, including high-performance vehicles. The spinning rocket attitude control system (SPINRAC) has been developed by Saab Ericsson Space for rockets reaching altitudes of 800-1,000 km. With the MAXUS sounding rocket for microgravity experiments, payloads of 500 kg can be launched to an altitude of 1,000 km, which allows

microgravity conditions for 13-15 minutes compared with the 6-7 minutes possible earlier.

33. At Esrange, scientific balloons with a volume up to 2 million cubic metres can be launched, allowing a payload of 2 tons to be carried to an altitude of 45 km. Balloon-borne instruments are used for atmospheric (e.g. depletion of the ozone layer) and astronomical studies and for experiments in microgravity.

34. Esrange is also used in various satellite projects and a number of ground facilities for the support of national and international spacecraft programmes. It operates and monitors satellites on behalf of customers or offers use of the station in a transparent mode where remote customers are connected to the station for real-time access to their satellites. The ground control station for the Swedish telecommunication and direct broadcasting satellite (DBS) series Sirius is also located at Esrange.

35. A facility for the reception, recording, archiving, processing and dissemination of remote sensing satellite data was established at Esrange in 1978. The station was originally used for spacecraft in the LANDSAT series and operated within the framework of the ESA Earthnet programme. The station has been extended to handle data from both remote sensing and scientific satellites and has several independent antennas and processing systems.

36. ESA has established a ground station for the Earth observation satellites ERS 1, ERS 2 and ENVISAT at Salmijärvi, in the vicinity of Esrange. The station is operated by SSC.

4. International cooperation

37. Most of Sweden's international cooperation is performed within the framework of ESA. Sweden participates in the mandatory basic and scientific programmes, as well as in the optional programmes on Earth observation, telecommunications, microgravity, launcher development, the International Space Station and technology (General Support Technology Programme).

38. Bilateral cooperation on space science and applications, primarily the SPOT programme for remote sensing, is carried out between France and Sweden under agreements with the Centre national d'études spatiales (CNES). The VEGETATION programme is developed jointly by Belgium, France, Italy, Sweden and the European Commission.

39. Memorandums of understanding have been concluded as bases for cooperation with the space agencies in Austria, Canada, China, India and the Russian Federation. Other bilateral cooperative efforts are carried out on an ad hoc basis.

40. Sweden is a member of ESA, Intelsat, the European Telecommunications Satellite Organization, the International Maritime Satellite Organization, the European Organisation for the Exploitation of Meteorological Satellites and the Committee on Earth Observation Satellites.

5. Information and communication activities

41. Increasing awareness of the importance of space activities and providing opportunities for youth to learn more about space, as recommended by

UNISPACE III, are considered important actions in Sweden. SNSB regularly initiates various communications projects in cooperation with museums, media and other partners.

42. SNSB actively supports the media, for example, by arranging contacts with scientists and providing the media with proper material. SNSB also contributes both editorially and financially to popular science magazines. The SNSB web site provides extensive popular information and SNSB handles a large number of questions concerning space from the general public.

43. SNSB regularly arranges contests for different levels of education as well as for teachers, often in cooperation with other national and international organizations, such as the International Space Camp and the International Astronomy Olympics. A number of exhibitions at museums with lectures organized for youth have been arranged in collaboration with different partners. SNSB financially supports student projects and also supports various international projects for youth, mainly organized together with ESA.

44. Furthermore, some of the major Swedish space industries and institutes have recently introduced a National Space Forum in Sweden with the purpose of increasing awareness of the importance of space activities among both Swedish decision makers and the general public.

6. National space legislation

45. Swedish space legislation consists of the Act on Space Activities (1982:963) and the Decree on Space Activities (1982:1069). These two legislative instruments give the jurisdictional framework for Swedish space activities, form the basis for licensing procedures with regard to non-governmental space activities, provide for supervision and control of space activities and establish national rules for registration in accordance with the Convention on Registration of Objects Launched into Outer Space (General Assembly resolution 3235 (XXIX), annex).

Syrian Arab Republic

[Original: Arabic]

1. The General Organization of Remote Sensing (GORS) made use of space data in the implementation of many development studies and projects, in addition to internal and external training courses in the various techniques and applications of remote sensing, as well as other subsystems, such as GIS and GPS. The most important activities undertaken during 2003 are described below.

1. Studies and projects

2. In the field of geological and hydrological applications, activities include:

(a) Follow-up to the project for updating geological maps, by using remote sensing technologies, on the scale of 1:50,000;

(b) Follow-up to the project for identifying sites for the drilling of underground water wells, by using space and geophysical data in all the Syrian regions, for the benefit of villages suffering from lack of water;

(c) Follow-up to the project on the study and evaluation of oil and gas operations in the northern regions and the Palmyra chain;

(d) Follow-up to the drawing of investment maps for the Syrian governorates (Governorate of Damascus Rural Area, Governorate of Soweida and Governorate of Qunaitra);

(e) Project to study the phenomenon of water leakage from Baath Dam Lake to Al-Rasafa;

(f) Project to evaluate the geological and hydrological situation in the Upper Orontes River;

(g) Project to study the water situation in the Euphrates River Basin.

3. In the field of planning and town development, activities include:

(a) Project for the study, enhancement and utilization of the northern Damascus area;

(b) Preparation of schemes for the expansion of construction in many governorates and towns with the use of space data;

(c) Study of the locations of many tourist and industrial establishments in Homs and Palmyra;

(d) Study of digital road maps in the Governorate of Latakia.

4. In the field of environmental studies, activities include:

(a) Project for a geo-environmental survey of Homs and its outskirts, on the scales of 1:200,000 and 1:500,000, and of some selected areas with the use of remote sensing techniques;

(b) Using remote sensing techniques to study archaeological sites (the Beit el-Wadi Cave);

(c) Project to determine locations for landfill sites and solid waste dumps, for the benefit of administrative units in the Governorate of Homs;

(d) Project for climate studies using the Earth climate station located in GORS.

5. In the field of agricultural studies, activities include:

(a) Follow-up to the project to update soil maps with the use of space data;

(b) Follow-up to the integrated development project for the Syrian desert, in cooperation with the Arab Centre for the Study of Arid Zones and Dry Lands with the use of space data;

(c) Follow-up to the project to improve monitoring of coastal land degradation in Syria and Lebanon with the use of space data, in cooperation with the Lebanese Remote Sensing Centre and the Mediterranean Remote Sensing Centre of Italy;

(d) Project to determine the feasibility of afforestation of the coastal lands in Syria and Lebanon with fruit-bearing pine and carob trees.

2. Training, qualification and participation in international activities

6. Activities organized by GORS include the following:

(a) A training course on cartography for a group of technicians from GORS;

(b) A training course on the Arc/Info 8.2 programme for staff of GORS;

(c) A training course on photogrammetry for a group of technicians from GORS;

(d) A training course on the GEO MEDIA programme for staff of the Drinking Water Organization in Latakia;

(e) A scientific symposium on the investment map of Syria;

(f) An international workshop on remote sensing applications and education, in cooperation with the Committee on Space Research, the Office for Outer Space Affairs and ESA.

7. Activities in which GORS has participated include the following:

(a) An international workshop on the technology and applications of satellite imaging, held in Pakistan and organized by the Inter-Islamic Network on Space Sciences and Technology;

(b) Meetings of the Committee on the Peaceful Uses of Outer Space and its Scientific and Technical Subcommittee, as well as their subsidiary bodies, held in Vienna in 2003, including the Working Group of the Committee established to prepare a report for submission to the General Assembly at its fifty-ninth session for the review of the progress made in the implementation of the recommendations of UNISPACE III;

(c) Ninth Exhibition of Information and Communication Technology, held in Damascus;

(d) Functions of the Teachers Syndicate on the greenhouse effect and its impact on the preparation of an evaluation of power reserves and supplies, held in Damascus;

(e) A symposium on oil and gas, held in Damascus;

(f) Meetings of the Board of Directors of the Arab Iron and Steel Union, held in Mauritania;

(g) A symposium on geodesy, held in Tunisia;

(h) Participation in the implementation of the recommendations of UNISPACE III;

(i) Workshop to discuss strategy on drought, held by the Ministry of Agriculture in Damascus;

(j) Twelfth Meeting of the Regional Centre for Remote Sensing of the North African States, held in Tunisia;

(k) Regional workshop on fisheries, fish breeding and water environment, held in Latakia;

(l) International conference on remote sensing and Earth studies, held in Toulouse, France;

(m) Conference on Aerial Survey Week, held in Stuttgart, Germany;

(n) United Nations/Austria/European Space Agency Symposium on Space Applications for Sustainable Development: Supporting the Plan of Implementation of the World Summit on Sustainable Development, held in Graz, Austria;

(o) United Nations/International Astronautical Federation Workshop on Education and Capacity-Building in Space Technology for the Benefit of Developing Countries, with emphasis on remote sensing, held in Bremen, Germany;

(p) Meetings for the development of cooperation with Ukraine and visits to the Ukrainian Space Agency and the Russian establishment for the manufacture of instruments in the Russian Federation.

Thailand

[Original: English]

Space-Related Activities in Thailand, a report prepared by the Geo-Informatics and Space Technology Development Agency, will be distributed during the forty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, from 16 to 27 February 2004.

United Kingdom of Great Britain and Northern Ireland

[Original: English]

Space Activities 2003, the annual report of the British National Space Centre, will be distributed during the forty-first session of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, from 16 to 27 February 2004.