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Report of the Scientific and Technical Subcommittee on its thirty-seventh session, held in Vienna from 7 to 18 February 2000

Contents

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I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its thirty-seventh session at the United Nations Office at Vienna from 7 to 18 February 2000 under the chairmanship of Dietrich Rex (Germany).

2. The Subcommittee held 19 meetings.

A. Attendance

3. Representatives of the following Member States attended the session: Argentina, Australia, Austria, Brazil, Bulgaria, Canada, Chile, China, Colombia, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kazakhstan, Kenya, Lebanon, Mexico, Morocco, Netherlands, Nigeria, Pakistan, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, South Africa, Spain, Sudan, Sweden, Syrian Arab Republic, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay and Venezuela.

4. Representatives of the following specialized agencies and other organizations in the United Nations system attended the session: United Nations Educational, Scientific and Cultural Organization (UNESCO), International Telecommunication Union (ITU), World Meteorological Organization (WMO) and International Atomic Energy Agency (IAEA).

5. The session was also attended by representatives of the European Space Agency (ESA), the International Mobile Satellite Organization (IMSO), the Committee on Space Research (COSPAR), the International Astronautical Federation (IAF), the International Astronomical Union (IAU), the International Society for Photogrammetry and Remote Sensing (ISPRS) and the International Space University (ISU).

6. A list of the representatives of Member States, specialized agencies and other international organizations attending the session is contained in document A/AC.105/C.1/INF/29.

7. At the 525th and 526th meetings, the Chairman informed the Subcommittee that requests had been received from the permanent representatives of Bolivia, Costa Rica, Finland, Georgia, Guatemala, Malaysia, Peru, Saudi Arabia, Slovakia, Sri Lanka, Switzerland and Tunisia to attend the session. Following past practice, they were invited to send delegations to attend the current session of the Subcommittee and to address it as appropriate, without prejudice to further requests of that nature; that action did not involve any decision of the Subcommittee concerning status but was a courtesy that the Subcommittee extended to those delegations.

B. Adoption of the agenda

8. On 7 February 2000, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.
2. Statement by the Chairman.
3. General exchange of views and introduction to reports submitted on national activities.
4. The United Nations Programme on Space Applications and the coordination of space activities within the United Nations system following the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
5. Matters relating to remote sensing of the Earth by satellites, including applications for developing countries and monitoring of the Earth's environment.
6. Use of nuclear power sources in outer space.
7. International cooperation in human spaceflight.
8. Presentations on new launch systems and ventures.
9. Space debris.
10. Examination of the physical nature and technical attributes of the geostationary orbit and of its utilization and applications, including, *inter alia*, in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries.
11. Draft provisional agenda for the thirty-eighth session of the Scientific and Technical Subcommittee.

12. Report to the Committee on the Peaceful Uses of Outer Space.

C. Documentation

9. A list of the documents that were before the Subcommittee is provided in annex I to the present report.

D. General statements

10. Statements were made by representatives of the following delegations during the general exchange of views: Argentina, Austria, Brazil, Canada, China, Colombia, Czech Republic, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Morocco, Pakistan, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Spain, Sudan, United Kingdom and United States of America. Statements were also made by the representatives of IAF, IAU, ISPRS and ISU.

11. During the general exchange of views, some delegations expressed the view that it would be desirable to expand the membership of the Committee on the Peaceful Uses of Outer Space. The Subcommittee noted that that matter should be considered by the Committee itself.

12. At the 526th meeting, the Director of the Office for Outer Space Affairs of the Secretariat made a statement reviewing the work programme of the Office. At the 527th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

13. The Subcommittee expressed its gratitude to the Chairman, Dietrich Rex (Germany), for his guidance and exemplary work, in particular his contribution to matters relating to space debris.

14. The Chairman, on behalf of the Subcommittee, expressed his gratitude to Nandasiri Jasentuliyana, the former Director of the Office for Outer Space Affairs, for his dedication to the work of the Committee and its subcommittees in over 30 years of service in the Office for Outer Space Affairs, and to Adigun Abiodun, the former Expert on Space Applications, for his commitment to promoting expertise in space science and technology in developing countries.

15. The Subcommittee noted with appreciation that the Government of France would provide an associate expert in space law to assist the Office for Outer Space Affairs in carrying out its work.

16. The representative of Austria, on behalf of the Group of Western European and Other States, informed the Scientific and Technical Subcommittee that it intended to nominate Karl Doetsch (Canada) as Chairman of the Subcommittee for the three-year term starting at its thirty-eighth session, in 2001.

E. Technical presentations

17. In accordance with General Assembly resolution 54/67 of 6 December 1999, a symposium on the theme “Space commercialization: an era of new opportunities and challenges” was organized by COSPAR and IAF. The first part of the symposium, entitled “Overview of space commercialization”, was held on 7 February 2000 and was chaired by K. Doetsch, representing IAF. The second part of the symposium, entitled “Commercialization of space exploration”, was held on 8 February 2000 and was chaired by J. Andersen, representing COSPAR.

18. The presentations to the symposium included the following: “Overview of space commercialization”, by L. Rains of Space News; “Towards a European global navigation system”, by A. Steciw of ESA; “Commercial aspects of remote sensing”, by D. El Hadani of the Royal Centre for Remote Sensing of Morocco; “Personal mobile satellite communication systems”, by A. Fuller of IMSO; “The Integrated Global Observing Strategy: commercial opportunities”, by R. Landis of WMO; “Commercialization of space exploration”, by K. Doetsch of ISU; “Clear radio skies”, by J. Cohen of the Jodrell Bank Observatory; “Commercialization of the International Space Station: SPACEHAB”, by B. Harris of SPACEHAB; and “Benefits to space applications of low-cost access to space”, by Wei Sun of the Surrey Space Centre.

19. In accordance with General Assembly resolution 54/68 of 6 December 1999, a symposium entitled “Interactive Multimedia Satellite Services: Implications for the Twenty-first Century” was held on 9 February 2000 to strengthen the partnership of the Subcommittee with industry. The symposium was moderated by B. Mahone of the Aerospace Industries Association.

20. The presentations to the symposium included the following: “New skies, new opportunities: satellite

communication opportunities for Member States arising from the creation of New Skies Satellites", by A. Faiola of New Skies Satellites Ltd.; "Trends in multimedia applications of space technology", by B. Mahone of the Aerospace Industries Association; "Satellite multimedia services in the Asia-Pacific region", by Ki-Jin Boo of Korea Telecom; "Space-based multimedia communications systems", by Y. Zubarev of the State Science and Research Institute of Radio of the Russian Federation; "SkyBridge: multimedia satellites", by P. Spencer of SkyBridge; and "Multimedia satellite services: African perspectives", by L. Shope-Mafole (South Africa).

21. Pursuant to General Assembly resolution 54/67, technical presentations were made by the following representatives on the issue of space debris and the solutions currently being adopted in that area at the national and international levels: F. Alby (France); V. Agapov (Russian Federation); M. Yakovlev (Russian Federation); N. Johnson (United States); W. Flury, in his capacity as representative of ESA; and W. Flury, in his capacity as representative of the Inter-Agency Space Debris Coordination Committee (IADC).

22. Pursuant to General Assembly resolution 54/67, technical presentations were made by the following representatives on the issue of remote sensing of the Earth by satellites:

(a) I. Glazokova (Russian Federation): the creation of a European environmental monitoring service;

(b) V. Oraevsky (Russian Federation): the application of small satellites for monitoring of natural and technogenic disasters;

(c) S. Pulinets (Russian Federation): remote sensing techniques for registration of short-term precursors of disastrous earthquakes from on-board space platforms and the possible Earth-space system for their global monitoring.

23. Pursuant to General Assembly resolution 54/67, technical presentations were made by the following representatives on the use of nuclear power sources in outer space:

(a) S. Harbison (United Kingdom): the United Kingdom position on technical processes and technical standards relevant to nuclear power sources in space;

(b) J. Wheeler (United States): safety processes and standards for United States space and terrestrial nuclear power systems;

(c) A. González of IAEA: the use of nuclear power sources.

24. Pursuant to General Assembly resolution 54/67, K. Clark (United States) made a technical presentation on the International Space Station.

25. Pursuant to General Assembly resolution 54/67, technical presentations were made by the following representatives on new launch systems and ventures:

(a) M. Doubovik (France): STARSEM, a Euro-Russian venture on space transportation;

(b) M. Oehm (Germany): EUROCKOT, a new German/Russian commercial launch service provider;

(c) M. Nair (India): the Geosynchronous Satellite Launch Vehicle (GSLV), the new launch vehicle of the Indian Space Research Organization (ISRO);

(d) E. Motornyi (Russian Federation): the Angara launcher family, a status report;

(e) B. Mahone (United States): new United States launch ventures.

26. Pursuant to General Assembly resolution 54/67, technical presentations were made by the following:

(a) J. Andersen of IAU: international coordination related to near-Earth objects;

(b) K. Snook and J. Moody of the Youth Advisory Council: the Youth Advisory Council.

27. The Subcommittee noted with satisfaction the quantity and quality of the technical presentations.

F. Adoption of the report of the Scientific and Technical Subcommittee

28. After considering the various items before it, the Subcommittee, at its 543rd meeting, on 18 February 2000, adopted its report to the Committee on the Peaceful Uses of Outer Space, containing its views and recommendations as set out in the paragraphs below.

II. United Nations Programme on Space Applications and the coordination of space activities within the United Nations system following the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)

29. In accordance with General Assembly resolution 54/67, the Scientific and Technical Subcommittee continued its consideration of the item on the United Nations Programme on Space Applications and the coordination of space activities within the United Nations system and reconvened the Working Group of the Whole under this item to consider the future work of the Subcommittee in the light of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).

30. The representatives of Brazil, the Czech Republic, France, Greece, Hungary, Indonesia, Japan, Morocco, Nigeria, Romania, the United States and Venezuela made statements under this agenda item.

31. The Subcommittee had before it a conference room paper (A/AC.105/C.1/2000/CRP.4) in which Canada proposed that the Subcommittee consider establishing an informal working group on the implementation of the recommendations of UNISPACE III, using the Committee on Earth Observation Satellites (CEOS) as a model. It was proposed that the Working Group of the Whole be requested by the Subcommittee to act as the informal working group and to establish informal, open-ended task forces, each dedicated to recommendations of UNISPACE III on a particular subject. Intergovernmental and non-governmental organizations and other interested parties, including industry, could participate in the task forces. The task forces would be chaired by representatives of Member States, conduct their work by consensus, meet as often as necessary and report back to the informal working group. The task forces would be encouraged to use electronic channels of communication as much as possible and to coordinate their meetings, as required, during the sessions of the Subcommittee. While some delegations expressed their support for the proposal, others were of the view that the proposed mechanism for implementing the recommendations of UNISPACE III would not be appropriate within the framework of the Subcommittee and its Working Group of the Whole.

32. The Working Group of the Whole was chaired by Muhammad Nasim Shah (Pakistan). It held nine meetings from 10 to 17 February 2000.

33. At the 543rd meeting of the Subcommittee on 18 February 2000, the Chairman of the Working Group of the Whole made a statement and presented to the Subcommittee the report of the Working Group of the Whole. At the same meeting, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex II to the present report.

A. United Nations Programme on Space Applications

34. The Subcommittee had before it the report of the United Nations Expert on Space Applications (A/AC.105/730). The report was supplemented by a statement from the Expert. The Subcommittee noted that the United Nations Programme on Space Applications for 1999 had been carried out satisfactorily and commended the work accomplished by the Expert in that regard.

35. The Subcommittee noted with appreciation that, since its previous session, additional contributions for 1999 and 2000 had been offered by various Member States and organizations and had been acknowledged in the report of the Expert (A/AC.105/730, paras. 36-37). The Subcommittee also noted with appreciation that the Government of Austria had once again provided an associate expert to support the implementation of the United Nations Programme on Space Applications.

36. The Subcommittee continued to express its concern over the still limited financial resources available for carrying out the United Nations Programme on Space Applications and appealed to Member States to support the Programme through voluntary contributions. The Subcommittee felt that the limited resources of the United Nations should be focused on the activities with the highest priority and noted that the United Nations Programme on Space Applications was the priority activity of the Office for Outer Space Affairs.

37. The Subcommittee noted with satisfaction that the General Assembly, in its resolution 54/68, had requested the Secretary-General to modify the terms of reference of the Trust Fund for the United Nations Programme on

Space Applications to include implementation of the recommendations of UNISPACE III. The Subcommittee also noted with satisfaction that, in the same resolution, the Assembly had also requested the Secretary-General to invite all States to contribute voluntarily to the Trust Fund and, in his letter of invitation, to identify priority project proposals, on the basis of recommendations of the Committee on the Peaceful Uses of Outer Space, and had requested the Office for Outer Space Affairs to provide the Committee with a report listing those States which had responded to his invitation.

38. The Subcommittee noted that the United Nations Programme on Space Applications had achieved much with limited resources. The Subcommittee agreed that there was no need for radical changes; however, it noted that the Programme could be reoriented to better assist developing countries and countries with economies in transition in participating in and benefiting from the implementation of the recommendations of UNISPACE III, particularly those contained in the Vienna Declaration on Space and Human Development.[1] For this purpose, the emphasis should be on identifying a number of well-defined areas of priority, on optimizing the relation between the various types of activities conducted under the Programme, on seeking to strengthen partnerships for cooperation and initiating new ones and on increasing the financial and in-kind resources available for carrying out the mandate of the Programme.

39. The Subcommittee noted that the Programme was aimed at promoting, through international cooperation, the use of space technologies and space-related data for sustainable economic and social development in developing countries by raising the awareness of decision makers of the cost-effectiveness and additional benefits to be obtained; establishing or strengthening the capacity in developing countries to use space technology; and strengthening outreach activities to disseminate awareness of the benefits obtained. The Subcommittee also noted that, in implementing the Programme, the Expert on Space Applications would take into consideration the guidelines provided by the Working Group of the Whole, contained in annex II to the present report.

40. The Subcommittee noted that the activities of the Programme would focus on:

(a) Supporting education and training for building capacity in developing countries through:

(i) Providing support to the regional centres for space science and technology education, including the Network of Space Science and Technology Education and Research Institutions in Central Eastern and South-Eastern Europe;

(ii) Organizing workshops on advanced space applications and short- and medium-term training programmes;

(iii) Reorienting the long-term fellowship programme, including the provision of support for the implementation of pilot projects;

(iv) Promoting the participation of university graduates and young professionals in space activities;

(b) Providing technical assistance to promote the use of space technologies in development programmes by:

(i) Continuing to support pilot projects as follow-up to past activities of the Programme (e.g. the series of courses and workshops organized in cooperation with ESA);

(ii) Initiating cooperative pilot projects in areas of priority concern to Member States;

(iii) Providing technical advice, on request, to Member States, bodies and specialized agencies of the United Nations system and relevant national and international organizations;

(c) Enhancing access to space-related data and other information by:

(i) Identifying existing information systems and promoting their use and enrichment;

(ii) Implementing an outreach programme for university graduates, young professionals, decision makers and the general public;

(iii) Further developing the international space information system (through the home page of the Office for Outer Space Affairs and published materials, including multimedia publications on CD-ROM).

41. The Subcommittee noted that the Expert on Space Applications had proposed to strengthen the Programme by (A/AC.105/730, para. 35):

(a) Increasing the resources available to it by internally adjusting priorities and by seeking additional regular and extrabudgetary funds and in-kind contributions;

(b) Further orienting several activities of the Programme to support priority objectives;

(c) Working with the regional commissions and specialized agencies of the United Nations system and relevant national and international organizations;

(d) Establishing flexible but well-defined terms for cooperation with partners (for instance, what is to be achieved and in which time-frame);

(e) Fostering, incrementally, the participation of private industry in its activities;

(f) Establishing feedback mechanisms with clients and cooperating partners.

1. Year 1999

United Nations conferences, training courses and workshops

42. With regard to the activities of the United Nations Programme on Space Applications carried out in 1999, the Subcommittee expressed its appreciation to the following:

(a) The Government of Jordan, as well as ESA, for co-sponsoring the Eighth United Nations/European Space Agency Workshop on Basic Space Science, hosted by the Al al-Bayt University and held in Mafraq, Jordan, from 13 to 17 March 1999;

(b) The Government of Sweden, represented by the Swedish International Development Cooperation Agency, for co-sponsoring the Ninth United Nations/Sweden International Training Course on Remote Sensing Education for Educators, hosted by the University of Stockholm and the Swedish Space Corporation and held in Stockholm and Kiruna, Sweden, from 3 May to 11 June 1999;

(c) The Government of China, as well as ESA, for co-sponsoring the United Nations/China/European Space Agency Conference on Space Applications in Promoting Sustainable Agriculture, hosted by the Ministry of Science and Technology and the Ministry of Agriculture of China and held in Beijing from 14 to 17 September 1999;

(d) The Government of the Netherlands, as well as IAF, for co-sponsoring the United Nations/International Astronautical Federation Workshop on Space: an Integral Part of Sustainable Development, held in Enschede, the Netherlands, from 30 September to 3 October 1999;

(e) The Government of Spain for co-sponsoring the United Nations/Spain Workshop on Space Technology for Emergency Aid/Search and Rescue Satellite-Aided Tracking System for Ships in Distress, hosted by the National Institute for Aerospace Technology (INTA) of Spain and held in Maspalomas, Gran Canaria, Spain, from 23 to 26 November 1999.

Long-term fellowships for in-depth training

43. The Subcommittee expressed appreciation to ESA for having offered three fellowships for research in remote sensing technology at the European Space Research Institute facilities of ESA in Frascati, Italy.

44. The Subcommittee noted that it was important to increase the opportunities for in-depth education in all areas of space science, technology and applications projects through long-term fellowships and urged Member States to make such opportunities available at their relevant institutions.

Technical advisory services

45. The Subcommittee took note of the following technical advisory services being provided under the United Nations Programme on Space Applications in support of projects involving regional space applications:[2]

(a) Collaboration with ESA on follow-up activities relating to the series of workshops on basic space science;

(b) Providing assistance to support the growth and operation of the Asia-Pacific Satellite Communications Council (APSCC), as well as technical assistance in the preparations for the APSCC 2000 Conference and Exhibition, entitled “New Vision for Satellite Communication in the 21st Century”;

(c) Co-sponsoring with the American Institute of Aeronautics and Astronautics a workshop on the theme “International space cooperation: solving global problems”, held in Bermuda from 11 to 15 April 1999;

(d) Presenting the results of UNISPACE III at the second Ministerial Conference on Space Applications for Sustainable Development in Asia and the Pacific, organized by the Economic and Social Commission for Asia and the Pacific (ESCAP), hosted by the Government of India and held in New Delhi from 15 to 20 November 1999;

(e) Presenting the results of UNISPACE III to the thirteenth plenary meeting of the Committee on Earth Observation Satellites (CEOS), held in Stockholm from 10 to 12 November 1999, and offering to support CEOS activities in the year 2000;

(f) Assisting ESA in providing the Water Research Institute in Accra with computers and software to strengthen the indigenous capability in using remote

sensing and Geographic Information System (GIS) data in various environmental and water resource applications in Ghana;

(g) Collaborating with ESA and the Department of Economic and Social Affairs of the Secretariat in providing the necessary technical assistance and expertise required for initiating a project on the use of Earth observation data for monitoring glaciers and snow cover in Latin America, as well as for implementing in the year 2000 projects in Africa and in Asia and the Pacific aimed at strengthening the capacity of participating institutions in developing countries to use satellite data for resource management.

Promotion of greater cooperation in space science and technology

46. The Subcommittee noted that the United Nations Programme on Space Applications had co-sponsored the participation of scientists from developing countries in the United Nations/International Astronautical Federation Workshop on Space, held in Enschede from 30 September to 3 October 1999, and the participation of those scientists in the fiftieth Congress of the International Astronautical Federation, held from 4 to 8 October 1999.

47. The Subcommittee noted that the United Nations Programme on Space Applications had collaborated with the Bulgarian Academy of Sciences on the national coordinators' meeting on the operation and functioning of the Network of Space Science and Technology Education and Research Institutions for Central Eastern and South-Eastern Europe, held in Sofia from 21 to 22 October 1999.

2. Year 2000

United Nations conferences, training courses, workshops and symposia

48. The Subcommittee recommended the approval of the following programme of workshops, training courses and symposia planned for 2000:

(a) Tenth United Nations/Sweden International Training Course on Remote Sensing Education for Educators, to be held in Kiruna and Stockholm, Sweden, from 2 May to 9 June 2000;

(b) Ninth United Nations/European Space Agency Workshop on Basic Space Science: Satellites and Network of Telescopes—Tools for Global Participation in the Studies of the Universe, to be held in Toulouse, France, from 27 to 30 June 2000;

(c) United Nations/European Space Agency/Committee on Space Research Workshop on Data Analysis Techniques, to be held in Bangalore, India, in August 2000;

(d) United Nations/Austria symposium on promoting the participation of young professionals in space-related fields, to be held in Graz, Austria, from 11 to 14 September 2000;

(e) United Nations/International Astronautical Federation Workshop on Operational Strategy for Sustainable Development Using Space, to be held in São José dos Campos, Brazil, from 28 to 30 September 2000;

(f) United Nations/International Academy of Astronautics Workshop on Small Satellites in Latin America, to be held during the fifty-first Congress of the International Astronautical Federation in Rio de Janeiro, Brazil, in October 2000;

(g) United Nations/European Space Agency Workshop on the Use of Space Technology in Disaster Management, to be held in Iquique, Chile, during the fourth quarter of 2000;

(h) United Nations Workshop on Multimedia Satellite Applications, to be held in Kuala Lumpur during the fourth quarter of 2000;

(i) The following workshops to be organized in the year 2000 at the regional centres for space science and technology education, affiliated to the United Nations:

(i) In India:

a. Workshop on Satellite Meteorology and Global Climate;

b. Workshop on Space and Atmospheric Science;

c. Workshop on Remote Sensing and Geographic Information Systems;

(ii) In Morocco:

a. Workshop on Remote Sensing and Geographic Information Systems;

b. Workshop on Space Telecommunications;

(iii) In Nigeria: Workshop on Remote Sensing and Geographic Information Systems.

49. The Subcommittee noted that the United Nations Programme on Space Applications would co-sponsor the participation of scientists from developing countries in the thirty-third Scientific Assembly of the Committee on Space Research, to be held in Warsaw from 16 to 23 July 2000.

50. The Subcommittee noted that, in his report (A/AC.105/730, para. 5), the Expert on Space Applications had indicated that the activities of the Programme to be implemented in 2000 would be presented to the Committee on the Peaceful Uses of Outer Space at its forty-third session for its approval.

3. Year 2001

51. The Subcommittee noted that the following activities had been proposed for 2001:

(a) Eleventh United Nations/Sweden International Training Course on Remote Sensing Education for Educators, to be held in Stockholm and Kiruna, Sweden;

(b) United Nations/European Space Agency Workshop on Remote Sensing for Environmental Monitoring and Natural Resource Management, to be held in Prague;

(c) United Nations/International Astronautical Federation workshop on the use of space technology for the benefit of developing countries, to be held in Toulouse, France;

(d) Tenth United Nations/European Space Agency Workshop on Basic Space Science, for developing countries in Africa, to be held in Mauritius;

(e) United Nations/Austria symposium on promoting the participation of young professionals in space-related fields, to be held in Graz, Austria;

(f) Several workshops to be organized at the regional centres for space science and technology education.

B. International space information service

52. The Subcommittee noted with satisfaction that the eleventh in the series of documents containing selected papers from the activities of the Programme, entitled *Seminars of the United Nations Programme on Space Applications*, had been issued.[3] A booklet entitled *Space for Development*, which contained detailed descriptions of past and ongoing activities of the United Nations Programme on Space Applications and an indication of its future activities, had been issued for UNISPACE III. The Subcommittee also noted with satisfaction the publication of *Highlights in Space 1999*[4] and of the proceedings of the Technical Forum at UNISPACE III.[5]

53. The Subcommittee noted with satisfaction that information for Member States and the general public on the latest developments in the activities carried out by the Programme including presentations made at events organized by the Office for Outer Space Affairs, had been made available on the web site of the Office for Outer Space Affairs (http://www.un.or.at/OOSA). The schedules, objectives and programmes of planned activities had also been made available on that web site.

C. Reports

54. The Subcommittee took note with appreciation of the reports submitted to it by Member States (A/AC.105/729 and Add.1 and 2) in response to a request made by the Committee on the Peaceful Uses of Outer Space at its forty-second session.[6]

D. Coordination of space activities within the United Nations system and inter-agency cooperation

55. The Subcommittee continued to stress the necessity of ensuring continuous and effective consultations and coordination in the field of outer space activities among organizations within the United Nations system and the avoidance of duplicative activities. The Subcommittee noted with satisfaction that the United Nations Programme on Space Applications had begun to enhance coordination efforts with regional space events such as the ESCAP Regional Space Applications Programme for Sustainable Development in Asia and the Pacific.

56. The Subcommittee noted with satisfaction that the Inter-Agency Meeting on Outer Space Activities had held its twentieth session at the United Nations Office at Vienna from 2 to 4 February 2000 and that the report on its deliberations (A/AC.105/727) and the report of the Secretary-General entitled “Coordination of outer space activities within the United Nations system: programme of work for 2000 and 2001 and future years” (A/AC.105/726) were before the Subcommittee.

57. The Subcommittee noted that the next session of the Inter-Agency Meeting on Outer Space Activities was scheduled to be held from 22 to 24 January 2001 at the United Nations Office at Vienna and that it would be hosted by the Office for Outer Space Affairs.

E. Regional and interregional cooperation

58. The Subcommittee noted with appreciation the continuing efforts undertaken by the United Nations Programme on Space Applications, in accordance with General Assembly resolution 45/72 of 11 December 1990, in leading an international effort to establish regional centres for space science and technology education in existing national or regional educational institutions in developing countries. The Subcommittee also noted that, once established, each centre could expand and become part of a network that could cover specific programme elements in established institutions related to space science and technology in each region.

59. The Subcommittee recalled that the General Assembly, in its resolution 50/27 of 6 December 1995, had endorsed the recommendation of the Committee that the centres be established on the basis of affiliation to the United Nations as early as possible and that such affiliation would provide the centres with the necessary recognition and would strengthen the possibilities of attracting donors and of establishing academic relationships with national and international space-related institutions.

60. The Subcommittee noted with satisfaction that the African Regional Centre for Space Science and Technology—in French Language had held a workshop in Rabat from 22 to 23 November 1999 on the orientation of the scientific activities of the Centre and that the Centre has started preparation of a directory of available African skills in space technology. The Subcommittee also noted that two courses were scheduled to begin in 2000.[7]

61. The Subcommittee noted with satisfaction the highlights of the programme of the African Regional Centre for Space Science and Technology Education—in English Language to be held at Ile-Ife, Nigeria, in 2000, presented in the report of the Expert on Space Applications (A/AC.105/730, para. 12).

62. The Subcommittee noted with satisfaction that the Centre for Space Science and Technology Education in Asia and the Pacific held its fourth Governing Board Meeting and its first Advisory Committee Meeting in New Delhi on 6 and 7 July 1999. The number of member States had reached 14. Three courses on remote sensing and geographic information systems (GIS), a course on satellite communication, a course on satellite meteorology and a course on space and atmospheric sciences had been held since the inauguration of the Centre. A second course on satellite communication had commenced on 1 July 1999 and a fourth course on remote sensing and GIS had begun on 1 October 1999.

63. The Subcommittee noted with satisfaction that, with the assistance of the Office for Outer Space Affairs, the member States concerned in Asia and the Pacific were undertaking consultations with a view to making the Centre for Space Science and Technology Education in Asia and the Pacific grow into a network of nodes.

64. The Subcommittee noted with satisfaction that the first meeting of the Governing Board of the Regional Centre for Space Science and Technology Education in Latin America and the Caribbean had been held in Brasilia on 15 October 1999.

65. The Subcommittee noted with satisfaction that, following the review of a report on an evaluation mission and of offers and commitments made by interested countries, Jordan had been identified as the country that would host the Regional Centre for Space Science and Technology Education in Western Asia. The Office for Outer Space Affairs had announced the establishment and location of the Centre.

66. The Subcommittee noted with satisfaction the report presented by the Chairman of the Steering Committee of the Network of Space Science and Technology Education and Research Institutions for Central Eastern and South-Eastern Europe on the activities of the Network that had been carried out since the last session of the Subcommittee.

67. The Subcommittee emphasized the importance of regional and international cooperation in making the benefits of space technology available to all countries by such cooperative activities as sharing payloads, disseminating information on spin-off benefits, ensuring compatibility of space systems and providing access to launch capabilities at reasonable cost.

III. Matters relating to remote sensing of the Earth by satellites, including applications for developing countries and monitoring of the Earth's environment

68. In accordance with General Assembly resolution 54/67, the Subcommittee continued its consideration of the item relating to remote sensing of the Earth.

69. In the course of the debate, delegations reviewed national and cooperative programmes in remote sensing. Examples were given of national programmes and of bilateral, regional and international cooperation, including programmes of technical cooperation among developing countries and programmes of countries with advanced capabilities to provide assistance to developing countries. The representatives of Argentina, Brazil, China, France, Hungary, India, Indonesia, Japan, Morocco and the United States, as well as the representative of ISPRS, made statements under this agenda item.

70. Representatives of the Russian Federation made three scientific and technical presentations on the subject of remote sensing (see para. 22 above).

71. The Subcommittee noted with satisfaction the subsection entitled "Environment and natural resources and remote sensing" in the report of UNISPACE III.[8]

72. The Subcommittee emphasized the importance of providing non-discriminatory access to state-of-the-art remote sensing data and to derived information at reasonable cost and in a timely manner and of building capacity in the adoption and use of remote sensing technology, in particular to meet the needs of developing countries.

73. The Subcommittee considered that international cooperation in the use of remote sensing satellites should be encouraged. It noted the importance of compatibility and complementarity of existing and future remote sensing systems, as well as the need for continuity in the acquisition of data. The Subcommittee also noted the importance, particularly for developing countries, of sharing experiences and technologies, of cooperating through international and regional remote sensing centres and of working on collaborative projects. The Subcommittee took note of the important contributions made by organizations such as CEOS and by mechanisms such as the Integrated Global Observing Strategy towards international cooperation in matters relating to remote sensing.

74. The Subcommittee emphasized the importance of remote sensing systems for advancing sustainable development, including monitoring of the Earth's environment.

IV. Use of nuclear power sources in outer space

75. In accordance with General Assembly resolution 54/67, the Scientific and Technical Subcommittee continued its consideration of the item on the use of nuclear power sources in outer space under the work plan that it had adopted at its thirty-fifth session (A/AC.105/697 and Corr.1, annex III, appendix). In accordance with the work plan, the Subcommittee identified terrestrial processes and technical standards that might be relevant to nuclear power sources, including factors distinguishing nuclear power sources in outer space from terrestrial nuclear applications.

76. The Subcommittee had before it the following documents:

(a) A note by the Secretariat, entitled "National research on space debris, safety of nuclear-powered satellites and problems of collisions of sources with space debris" (A/AC.105/731);

(b) A working paper submitted by the Russian Federation entitled "Collisions between nuclear power sources and space debris" (A/AC.105/C.1/L.233);

(c) A working paper submitted by the Russian Federation entitled "Identification of terrestrial processes and technical standards with a possible relevance to nuclear power sources, including factors distinguishing the use of nuclear power sources in outer space from terrestrial nuclear power applications" (A/AC.105/C.1/L.234);

(d) A working paper submitted by the United Kingdom entitled "Technical processes and technical standards relevant to nuclear power sources in space: the position of the United Kingdom of Great Britain and Northern Ireland" (A/AC.105/C.1/L.231);

(e) A working paper submitted by the United States entitled "Review of safety processes and standards for the United States space and terrestrial nuclear power systems" (A/AC.105/C.1/L.229).

77. The Subcommittee heard technical presentations under this agenda item by representatives of the United Kingdom, the United States and IAEA, as described in paragraph 23 of the present report.

78. The Subcommittee recalled that the General Assembly, in its resolution 47/68 of 14 December 1992, had adopted the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, contained in that resolution. The Subcommittee noted that the Committee on the Peaceful Uses of Outer Space, at its fortieth session, had recalled its agreement that the Principles should remain in their current form until amended and that, before amendment, proper consideration should be given to the aims and objectives of any proposed revision.[9] The Committee had agreed with the Subcommittee (A/AC.105/672, para. 80) that, while a revision of the Principles was not necessary at the current stage, it was important that States making use of nuclear power sources should conduct their activities in full accordance with the Principles.[10]

79. The Scientific and Technical Subcommittee agreed that, at the present time, revision of the Principles was not warranted. It also agreed that, until a firm scientific and technical consensus had been reached on the revision of the Principles, it would be inappropriate to pass on the topic to the Legal Subcommittee.

80. The Scientific and Technical Subcommittee noted that the Russian Federation had hosted the fifth international seminar on nuclear power sources in outer space, held from 23 to 25 March 1999, and would be hosting an international seminar on nuclear power in outer space in the twenty-first century that would be held from 19 to 21 April 2000.

81. Statements on the agenda item were made by the representatives of France, the Russian Federation and the United States, and by the representative of IAEA.

82. In accordance with General Assembly resolution 54/67, the Subcommittee, at its 536th meeting, on 14 February 2000, reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space under the chairmanship of Sam Harbison (United Kingdom). The Working Group held five meetings. At the meeting held on 18 February 2000, the Working Group adopted its report.

83. At its 543rd meeting, on 18 February 2000, the Subcommittee endorsed the report of the Working Group, which is contained in annex III to the present report.

V. International cooperation in human spaceflight

84. At its 531st meeting, following a brief introductory statement by the Chairman, the Scientific and Technical Subcommittee began its consideration of a new item for discussion entitled “International cooperation in human spaceflight”, in accordance with General Assembly resolution 54/67. The Subcommittee had before it a working paper by the United States that presented an overview of the International Space Station (A/AC.105/C.1/L.235).

85. In the course of the debate, delegations reviewed past, current and anticipated national and international programmes of cooperation in human spaceflight. Examples were given of international activities involving cooperation in national human spaceflight programmes such as Apollo, Soyuz, Salyut, Skylab, Space Shuttle, Spacelab and the Mir Space Station. In addition, the nature and role of the International Space Station, as well as the activities and contributions of various States leading to its development, assembly and utilization were discussed.

86. The Subcommittee heard a technical presentation on the International Space Station by a representative of the United States (see para. 24 above).

87. The Subcommittee noted the opportunities for countries without their own autonomous human spaceflight programmes that would be made available through activities to be carried out within the framework of the International Space Station and under the past and current national human spaceflight programmes of other countries.

88. The representatives of Brazil, France, Italy, the Russian Federation and the United States made statements under this agenda item.

VI. Presentations on new launch systems and ventures

89. At its 532nd meeting, following a brief introductory statement by the Chairman, the Scientific and Technical Subcommittee began its consideration of a new item for discussion entitled “Presentations on new launch systems and ventures”, in accordance with General Assembly resolution 54/67.

90. In the course of the debate, delegations reviewed advances by Governments and non-governmental organizations in developing a wide variety of new launch systems,

including modular launch vehicles, reusable launch vehicles and launch vehicles based on intercontinental ballistic missiles. The representatives of Germany, the Russian Federation and the United States made statements under this agenda item.

91. The Subcommittee noted developments within the private sector, including international joint ventures, as well as action by Governments to supervise activities of the private sector in this field.

92. The Subcommittee noted with satisfaction that the Legal Subcommittee, at its thirty-ninth session, in 2000, would be starting a three-year work plan entitled "Review of the concept of the 'launching State'".

93. The Subcommittee heard scientific and technical presentations on the subject of new launch systems and ventures by representatives of France, Germany, India, the Russian Federation and the United States (see para. 25 above).

VII. Space debris

94. In accordance with General Assembly resolution 54/67, the Subcommittee continued its consideration, on a priority basis, of the agenda item on space debris.

95. The Subcommittee agreed that further consideration of space debris was important and that international cooperation was needed to expand appropriate and affordable strategies to minimize the potential impact of space debris on future space missions.

96. The Subcommittee agreed that Member States should pay more attention to the problem of collisions of space objects, including those with nuclear power sources on board, with space debris and to other aspects of space debris. It noted that the General Assembly, in its resolution 53/45 of 3 December 1998, had called for the continuation of national research on that question, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris. The Subcommittee took note of the replies from Member States (A/AC.105/731) submitted to it in accordance with that request. The Subcommittee agreed that national research on space debris should continue and that Member States and international organizations should make available to all interested parties the results of that research, including information on practices adopted that had proved effective in minimizing the creation of space debris.

97. The Subcommittee agreed that adoption of the technical report on space debris (A/AC.105/720) at its previous session was an important achievement. It recalled its recommendation, endorsed by the Committee at its forty-second session,[11] that that report should be distributed widely, including by making it available to UNISPACE III, the Legal Subcommittee at its thirty-ninth session, in 2000, international organizations such as COSPAR, the International Academy of Astronautics (IAA), IAF and IADC and scientific gatherings such as the annual IAF Congress (see A/AC.105/719, para. 35). The Subcommittee noted with satisfaction that the report had already been distributed extensively and that the Secretariat would continue to distribute it.

98. Representatives of Brazil, China, the Czech Republic, France, Germany, Greece, India, Iran (Islamic Republic of), Italy, Japan, Morocco, the Russian Federation, Spain, the United Kingdom and the United States made statements on the item.

99. The Subcommittee heard scientific and technical presentations on the subject of space debris by representatives of France, the Russian Federation, the United States of America and ESA, as mentioned in paragraph 21 of the present report.

100. The Subcommittee noted with satisfaction that, following its invitation, a representative of IADC had made a technical presentation on its work with regard to the space debris issue, as mentioned in paragraph 21 of the present report. The Subcommittee agreed that IADC should be invited to make a technical presentation on its work on an annual basis.

101. The Subcommittee noted that cooperation had continued through IADC, with the participation of Japan, the National Aeronautics and Space Administration (NASA) of the United States, ESA, the Russian Aviation and Space Agency, the China National Space Administration, the British National Space Centre, the Centre national d'études spatiales (CNES) of France, ISRO, the Italian Space Agency and the German Aerospace Centre (DLR), to enable its members to exchange information on space debris activities, facilitate opportunities for cooperation in space debris research, review the progress of ongoing activities and identify debris mitigation options. It also noted that Ukraine had recently applied for membership in IADC.

102. The Subcommittee recalled that, at its forty-second session, the Committee on the Peaceful Uses of Outer Space had agreed[12] that the Subcommittee, at its thirty-seventh session, should review international application of ITU standards and IADC recommendations concerning the disposal of satellites in geosynchronous orbit at the end of their useful life. It also recommended that, to facilitate the review by the Subcommittee, the Secretariat should compile relevant data on space objects in geosynchronous orbit.

103. The Subcommittee noted with satisfaction the report prepared by the Secretariat in response to that request (A/AC.105/734). The report contained an analysis of information received from the Canadian Space Agency, CNES, ESA, the European Organization for the Exploitation of Meteorological Satellites and the International Telecommunications Satellite Organization. The Subcommittee expressed its appreciation for the invaluable assistance in the preparation of the report provided by the Astronomical Institute of the Czech Academy of Sciences, the European Space Operations Centre in Darmstadt, Germany, and the NASA Johnson Space Center in Houston, United States.

104. The Subcommittee noted that the ITU standards and IADC recommendations with respect to the disposal of spacecraft in geostationary orbit had been developed quite recently and were not mandatory. Most satellite operators were aware of the seriousness of the space debris situation near the geostationary orbit and had acknowledged the wisdom of undertaking some mitigation measures. However, the Subcommittee noted that, because of technical and managerial problems, even self-imposed guidelines were not being followed in some cases. It also noted that more research would be needed to understand fully the space debris environment near the geostationary orbit.

105. Some delegations expressed the view that existing catalogues of space objects, including objects near to the geostationary orbit, were far from complete and that some important information was missing even for the catalogued objects. The view was expressed that a reliable catalogue of space objects, accessible to all Member States, should be developed.

106. The view was expressed that all existing space debris observation data should be made available to Member States, so that experts from countries with no means for observation of space debris could make use of those data for study and for their active participation in discussions on space debris mitigation measures.

107. The view was expressed that an index to the United Nations Register of Objects Launched into Outer Space, which would provide an easy and quick reference to governmental announcements of space launches and changes in the status of space objects, including their decay in the atmosphere, would facilitate the work of the Subcommittee. It was proposed that the Secretariat prepare a sample of such an index for the thirty-eighth session of the Subcommittee.

108. The Subcommittee took note of the working papers and conference room papers regarding the future work of the Subcommittee on the issue of space debris submitted by the Russian Federation (A/AC.105/C.1/L.232), the United States (A/AC.105/C.1/L.236), Germany (A/AC.105/C.1/L.238), France, on behalf of Austria, Canada, the Czech Republic, Germany, Greece, Hungary, India, Indonesia, Italy, Pakistan, Poland, Portugal, Romania, Spain, Sweden and the United Kingdom (A/AC.105/C.1/L.239), and Japan (A/AC.105/C.1/2000/CRP.11).

109. Some delegations expressed the view that the Committee on the Peaceful Uses of Outer Space should ask the Legal Subcommittee to give its views on the technical report on space debris and on the applicability of the current space treaties to the issue of space debris. The Legal Subcommittee could help the Scientific and Technical Subcommittee to implement a new work plan, with the objective of adopting, in the future and in the light of a revised technical report, a set of principles dedicated to reducing production of space debris and to guiding further discussion by the Scientific and Technical Subcommittee. Other delegations expressed the view that it would be premature for the Legal Subcommittee to discuss legal issues relevant to space debris.

110. The view was expressed that a multi-year work plan should be adopted by the Scientific and Technical Subcommittee in order to develop a set of international guidelines for space debris mitigation efforts. It was proposed that an open-ended expert group could be established for the implementation of such a plan and that the support of IADC to the expert group would be welcomed.

111. Other delegations were of the view that it was premature to adopt such a multi-year work plan.

112. Having considered a conference room paper submitted by Canada, France, Germany, Greece, Italy, Japan, the Russian Federation and the United States (A/AC.105/C.1/2000/CRP.18), the Subcommittee agreed

to continue its work on space debris in 2001 as reflected in the report of the Working Group of the Whole, contained in annex II to the present report.

113. The view was expressed that, in order to ensure the safety of the International Space Station and other valuable space objects, a sophisticated international system should be developed for dissemination of information on dangerous close encounters of space objects and non-controlled re-entries of space objects into the upper atmosphere. The view was also expressed that the most urgent task at present was the refinement of models of non-observable fine particulate debris, so that they could be used for more precise formulation of requirements for the protection of spacecraft, with or without crew on board, against impacts of space debris.

VIII. Examination of the physical nature and technical attributes of the geostationary orbit and of its utilization and applications, including, *inter alia*, in the field of space communications, as well as other questions relating to developments in space communications, taking particular account of the needs and interests of developing countries

114. In accordance with General Assembly resolution 54/67, the Subcommittee continued its consideration of the item relating to the geostationary orbit and space communications.

115. The representatives of Brazil, Colombia, the Czech Republic, Ecuador, Germany, Greece, Guatemala (on behalf of the Group of Latin American and Caribbean States), Indonesia and Mexico made statements under this agenda item.

116. The Subcommittee recalled that the Committee on the Peaceful Uses of Outer Space, at its forty-first session,[13] in 1998, had agreed that the following principles were universally accepted by the scientific and technical community and should be applied to future deliberations on the geostationary orbit:

(a) The existence of orbits of all satellites, including geostationary satellites, depended mainly on gravitational phenomena generated by the entire body of the Earth;

(b) A geostationary satellite, whether acted upon by natural forces only or by man-made impulses, was not fixed over a point on the Earth's equator: between corrective impulses of its station-keeping, it was in a natural flight caused by gravitational as well as non-gravitational forces generated by the Earth, the Sun and the Moon.

117. The Subcommittee took note of the working paper submitted by the Czech Republic (A/AC.105/C.1/L.230), in which it was stated that an important implication could be drawn from the statements in subparagraphs 115 (a) and (b) above. The term "outer space" had been used in several instruments of international law to denote a certain region around the Earth into which space objects were launched and where those objects moved in orbits around the centre of the Earth. Since geostationary satellites were a specific group of the Earth's satellites, their orbits were in outer space. Consequently, a third statement could be made: the geostationary orbit was an integral part of outer space.

118. Some delegations expressed the view that the three statements in paragraphs 115 and 116 above could form the scientific basis for the geostationary orbit. They expressed the view that consensus on that issue would result in more time for discussion in the Scientific and Technical Subcommittee of telecommunication services provided from satellites in the geostationary orbit. Other delegations expressed their appreciation for the working paper submitted by the Czech Republic (A/AC.105/C.1/L.230) and stated that, because of its implications, it deserved careful study by their authorities before they could react to it. They also expressed the view that the Subcommittee should continue to consider the question of the geostationary satellite orbit until all delegations were convinced that a consensus had been reached.

119. Some delegations reiterated the view that the geostationary orbit was a limited natural resource with a number of *sui generis* characteristics, which risked saturation, and that, therefore, assurances should be given that the benefits of its exploitation would be extended to all nations, regardless of their present technical capabilities. They expressed the view that access to the geostationary orbit should be granted to all nations on an equitable and rational basis, with the Committee on the Peaceful Uses of Outer Space and ITU working together towards that goal,

taking into particular account the needs and interests of developing countries.

120. The view was expressed that the special characteristics of the geostationary orbit included characteristics relating to space mechanics, launching and positioning of geostationary satellites, perturbations in the geostationary orbit, station keeping of satellites in geostationary orbit, ground stations, the nominal position of geostationary satellites above a fixed point on the Earth's equator, and retirement from service of geostationary satellites.

121. Some delegations also expressed the view that, in order to give the most thorough consideration to the important issue of the geostationary orbit, its legal aspects should continue to be discussed simultaneously by the Legal Subcommittee.

IX. Draft provisional agenda for the thirty-eighth session of the Scientific and Technical Subcommittee

122. The Scientific and Technical Subcommittee noted that the General Assembly, in its resolution 54/67, had welcomed the new approach taken by the Committee in composing the agenda of the Scientific and Technical Subcommittee[14] and had noted that the Subcommittee at its thirty-seventh session would submit its proposal to the Committee on the Peaceful Uses of Outer Space for a draft provisional agenda for the thirty-eighth session of the Subcommittee, in 2001. Pursuant to paragraph 18 of Assembly resolution 54/67, the Subcommittee requested the Working Group of the Whole, established at its 531st meeting, to consider a draft provisional agenda for its thirty-eighth session.

123. At its 543rd meeting, the Subcommittee endorsed the recommendations of the Working Group of the Whole concerning the draft provisional agenda for the thirty-eighth session of the Subcommittee as contained in the report of the Working Group of the Whole (see annex II to the present report).

124. The Subcommittee recommended that its thirty-eighth session be held from 12 to 23 February 2001.

X. Other reports

125. The Subcommittee expressed its appreciation to COSPAR for its report on space research and to IAF for its report on space technology and applications, the two reports being compiled by the Office for Outer Space Affairs and issued jointly under the title *Highlights in Space 1999*.[15]

126. The Subcommittee took note of the compilation of papers from the Technical Forum at UNISPACE III, issued under the title *Proceedings of the Technical Forum*[16] and the compilation of selected papers presented during activities of the United Nations Programme on Space Applications in 1999, issued under the title *Seminars of the United Nations Programme on Space Applications*.[17]

127. The Subcommittee noted with appreciation the participation in its current session of representatives of United Nations bodies and specialized agencies and permanent observers. The Subcommittee noted that their statements and reports had been useful in enabling it to fulfil its role as focal point for international cooperation in space.

128. The Subcommittee had before it a conference room paper (A/AC.105/C.1/2000/CRP.8) containing the proposal submitted by the Office for Outer Space Affairs for programme 4 (Peaceful uses of outer space) of the proposed medium-term plan for the period 2002-2005.

Notes

[1] *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999* (United Nations publication, Sales No. E.00.I.3), chap. I, resolution 1.

[2] See the report of the Expert on Space Applications (A/AC.105/730, paras. 19-26).

[3] United Nations publication, Sales No. E.00.I.6.

[4] United Nations publication, Sales No. E.00.I.8.

[5] *Proceedings of the Technical Forum* (United Nations publication, Sales No. E.00.I.7).

[6] *Official Records of the General Assembly, Fifty-fourth Session, Supplement No. 20* (A/54/20), para. 119.

[7] See the report of the Expert on Space Applications (A/AC.105/730, para. 11).

[8] *Report of the Third United Nations Conference on the Peaceful Uses of Outer Space* ..., paras. 87-161.

[9] *Official Records of the General Assembly, Fifty-second Session, Supplement No. 20* (A/52/20), para. 78.

[10] Ibid., para. 79.

[11] Ibid., *Fifty-fourth Session, Supplement No. 20* (A/54/20), para. 42.

[12] Ibid., para. 44.

[13] Ibid., *Fifty-third Session, Supplement No. 20* (A/53/20), para. 107.

[14] Ibid., *Fifty-fourth Session, Supplement No. 20* (A/54/20), annex I, sect. A.

[15] United Nations publication, Sales No. E.00.I.8.

[16] United Nations publication, Sales No. E.00.I.7.

[17] United Nations publication, Sales No. E.00.I.6.

Annex I

Documents before the Scientific and Technical Subcommittee at its thirty-seventh session

Symbol	*Agenda item*	*Title or description*
A/AC.105/720	9	Technical report on space debris
A/AC.105/723	4	Report on the Eighth United Nations/European Space Agency Workshop on Basic Space Science: Scientific Exploration from Space, hosted by the Institute of Astronomy and Space Sciences at Al al-Bayt University on behalf of the Government of Jordan (Mafraq, Jordan, 13-17 March 1999)
A/AC.105/725	4	Report on the Ninth United Nations/Sweden International Training Course on Remote Sensing Education for Educators (Stockholm and Kiruna, Sweden, 3 May-11 June 1999)
A/AC.105/726	4	Report of the Secretary-General on the coordination of outer space activities within the United Nations system: programme of work for 2000 and 2001 and future years
A/AC.105/727	4	Report of the Inter-Agency Meeting on Outer Space Activities (Vienna, 2-4 February 2000)
A/AC.105/728	4	Report on the United Nations/China/European Space Agency Conference on Space Applications in Promoting Sustainable Agriculture (Beijing, 14-17 September 1999)
A/AC.105/729 and Add.1 and 2	3	Note by the Secretariat on international cooperation in the peaceful uses of outer space: activities of Member States
A/AC.105/730	4	Report of the United Nations Expert on Space Applications
A/AC.105/731	6	Note by the Secretariat on national research on space debris, safety of nuclear-powered satellites and problems of collisions of sources with space debris
A/AC.105/732	4	Report on the United Nations/Spain Workshop on Space Technology for Emergency Aid/Search and Rescue Satellite-Aided Tracking System for Ships in Distress (Maspalomas, Gran Canaria, Spain, 23-26 November 1999)

Symbol	*Agenda item*	*Title or description*
A/AC.105/733	4	Report on the United Nations/International Astronautical Federation Workshop on Space: an Integral Part of Sustainable Development (Enschede, the Netherlands, 30 September-3 October 1999)
A/AC.105/734	9	Report of the Secretariat on the disposal of satellites in geosynchronous orbit
A/AC.105/C.1/L.228	1	Provisional agenda and annotations
A/AC.105/C.1/L.229	6	Working paper submitted by the United States of America on review of safety processes and standards for the United States space and terrestrial nuclear power systems
A/AC.105/C.1/L.230	10	Working paper submitted by the Czech Republic on the geostationary orbit
A/AC.105/C.1/L.231	6	Working paper submitted by the United Kingdom of Great Britain and Northern Ireland on technical processes and technical standards relevant to nuclear power sources in space: the position of the United Kingdom of Great Britain and Northern Ireland
A/AC.105/C.1/L.232	9	Working paper submitted by the Russian Federation on research by the Russian Space Agency on the question of space debris
A/AC.105/C.1/L.233	6	Working paper submitted by the Russian Federation on collisions between nuclear power sources and space debris
A/AC.105/C.1/L.234	6	Working document submitted by the Russian Federation on the identification of terrestrial processes and technical standards with a possible relevance to nuclear power sources, including factors distinguishing the use of nuclear power sources in outer space from terrestrial nuclear power applications
A/AC.105/C.1/L.235	7	Working paper submitted by the United States of America on the International Space Station: overview

Symbol	*Agenda item*	*Title or description*
A/AC.105/C.1/ L.236	9	Working paper submitted by the United States of America on a proposal for consideration of matters related to space debris by the Scientific and Technical Subcommittee
A/AC.105/C.1/ L.237 and Add.1-8	12	Draft report of the Scientific and Technical Subcommittee on its thirty-seventh session
A/AC.105/C.1/ L.238	9	Working paper submitted by Germany on the continuation of work on space debris in 2001
A/AC.105/C.1/ L.239	9	Working paper presented by France on space debris
A/AC.105/C.1/ WG.5/L.35	6	Draft report of the Working Group on the Use of Nuclear Power Sources in Outer Space
A/AC.105/C.1/ WG.6/L.15	4 and 11	Draft report of the Working Group of the Whole
Background documents		
A/CONF.184/6		Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999
ST/SPACE/1		Proceedings of the Technical Forum
ST/SPACE/3		Seminars of the United Nations Programme on Space Applications
ST/SPACE/4		Highlights in Space, 1999

Annex II

Report of the Working Group of the Whole

1. In accordance with paragraph 18 of General Assembly resolution 54/67 of 6 December 1999, the Working Group of the Whole was reconvened at the thirty-seventh session of the Scientific and Technical Subcommittee to consider the future work of the Subcommittee in the light of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), held in Vienna from 19 to 30 July 1999. The Working Group held nine meetings, from 10 to 17 February 2000, to consider the implementation of the recommendations of UNISPACE III and the draft provisional agenda for the thirty-eighth session of the Subcommittee, in 2001. At its 9th meeting, on 17 February 2000, the Working Group adopted the present report.

2. Muhammad Nasim Shah (Pakistan) was elected Chairman of the Working Group of the Whole at the 531st meeting of the Scientific and Technical Subcommittee. The Chairman, in his opening remarks, reviewed the mandate of the Working Group of the Whole at its session in 2000.

A. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)

3. The Working Group of the Whole expressed its satisfaction with the successful results achieved by UNISPACE III, in particular the strategy contained in the resolution entitled "The Space Millennium: Vienna Declaration on Space and Human Development" and specific action programmes recommended by the Conference. The Working Group noted that the General Assembly, in its resolution 54/68 of 6 December 1999, had endorsed the resolution and had urged Governments, organs, organizations and programmes of the United Nations system as well as intergovernmental and non-governmental organizations and industries conducting space-related activities to take the necessary action for the effective implementation of the Vienna Declaration. The Working Group of the Whole also noted that the Assembly, in the same resolution, had called upon all concerned to implement the recommendations made by UNISPACE III as reflected in its report.[a]

4. The Working Group of the Whole had before it a proposal by Canada regarding the creation of an informal working group on the implementation of the recommendations of UNISPACE III (A/AC.105/C.1/2000/CRP.4) and a list of issues to be considered in the Working Group of the Whole (A/AC.105/C.1/2000/CRP.6), prepared by the Secretariat.

5. The Working Group of the Whole made the recommendations below concerning the implementation of the recommendations of UNISPACE III.

1. Mechanism to implement the strategy to address global challenges referred to in the Vienna Declaration on Space and Human Development

6. The Working Group of the Whole noted with satisfaction that there was a high level of interest in implementing the recommendations of UNISPACE III among all member States of the Committee on the Peaceful Uses of Outer Space and other States, as well as among space agencies, relevant intergovernmental organizations, including the United Nations specialized agencies, non-governmental organizations and other space-related institutions. The Working Group of the Whole recognized the need for a mechanism to coordinate international action aimed at implementing those recommendations.

7. In reviewing the recommendations of UNISPACE III, in particular the strategy to address global challenges as contained in the Vienna Declaration on Space and Human Development, the Working Group of the Whole recognized that there were two broad categories of action that would need to be taken. Those two categories, which were not mutually exclusive, were: (a) action to be taken by Member States and/or by the Office for Outer Space Affairs of the Secretariat within the framework of the Committee on the Peaceful Uses of Outer Space and its two subcommittees; and (b) action to be taken independently or jointly by interested space agencies, intergovernmental organizations, in particular the United Nations specialized agencies, non-governmental organizations, space-related institutions and industry, as well as research institutions.

8. The Working Group of the Whole agreed that the current structure of the agenda of the Scientific and Technical Subcommittee would facilitate the consideration of those issues of global concern and the implementation of the corresponding elements of the strategy referred to in the Vienna Declaration that were relevant to the work of the Subcommittee. The Working Group of the Whole recommended that the Subcommittee consider the items contained in the nucleus of the strategy to address global challenges as reflected in the Vienna Declaration through multi-year work plans, possibly considering two of those items at each of its sessions, with the intention of ensuring that the action associated with each of the items be taken and of coordinating international efforts in that area.

9. The Working Group of the Whole recommended that the Subcommittee, at its thirty-eighth session, should consider the items entitled "Using space applications for human security, development and welfare" and "Strengthening and repositioning of space activities in the United Nations system" under the multi-year work plans.

2. Organization, during the session of the Scientific and Technical Subcommittee, of a symposium to strengthen the partnership of the Subcommittee with industry

10. The Working Group of the Whole noted that, in accordance with General Assembly resolution 54/68, the Secretariat had organized, during the thirty-seventh session of the Scientific and Technical Subcommittee, a symposium on the theme "Interactive multimedia satellite services: implications for the twenty-first century", in order to strengthen the partnership of the Subcommittee with industry. The Working Group of the Whole also noted that the symposium had been organized on a trial basis and that the Director of the Office for Outer Space Affairs had invited Member States to provide suggestions regarding the symposium, in particular its theme, its speakers and its structure.

11. The Working Group of the Whole agreed that in selecting a theme for the symposium, it should be borne in mind that the symposium should address the needs of developing countries, generate interest among the space-related industries to participate and contribute to the symposium and allow for the participation of universities and research institutions, in particular in developing countries, which could be providers of space-related services and products. The Working Group of the Whole also agreed that the theme of the symposium should be related to public services and should be broad enough to allow participation of industries on an equitable geographical basis.

12. The Working Group of the Whole agreed that the symposium to be held during the thirty-eighth session of the Scientific and Technical Subcommittee, in 2001, should focus on the emerging applications of global navigation satellite systems in improving the productivity of national and regional infrastructure such as transportation, oil and gas networks, agriculture and telecommunications. The Working Group of the Whole also agreed that the symposium to be held during the thirty-ninth session of the Subcommittee, in 2002, should focus on the promising area of very high resolution remote sensing and its impact on operational applications and should discuss the new space market situation. As for subsequent symposia, the Working Group of the Whole agreed that the task of selecting a theme should be rotated among the members of the Group of Eastern European States, the Group of 77 and China and the Group of Western European and Other States.

13. The Working Group of the Whole agreed that the Secretariat should select speakers for the symposia keeping in mind equitable geographical representation and should inform the respective Governments of the representatives of industry whom it proposed to invite. Comments by those Governments, if any, should be sent to the Secretariat within two weeks following the receipt of that information. The Working Group of the Whole recommended that the Governments concerned should be encouraged to send the speakers for the symposium.

14. The Working Group of the Whole agreed that the structure of the symposium could remain the same as that of the symposium held during the thirty-seventh session of the Subcommittee, in 2000. The Working Group of the Whole recommended that the symposium to be held during the thirty-eighth session of the Subcommittee should be scheduled on the Monday of the second week of that session. The Working Group of the Whole noted that displays and demonstrations of services and products could be arranged by interested companies or other providers of services and products following the symposium, as contributions to it. The Working Group of the Whole also noted that such contributions could include financial support for the organization of the symposium. Speakers should be encouraged to include in their presentations reference to possible financing models and arrangements related to the applications being presented each year at the symposium

3. Promotion of the participation of youth in space activities and the establishment of a consultative mechanism within the framework of the Committee on the Peaceful Uses of Outer Space to facilitate the continued participation of young people in cooperative space-related activities

15. The Working Group of the Whole noted that the Vienna Declaration had called for action to be taken to create, within the framework of the Committee on the Peaceful Uses of Outer Space, a consultative mechanism to facilitate the continued participation of young people from all over the world, especially young people from developing countries and young women, in cooperative space-related activities.

16. The Working Group of the Whole agreed that Member States and their relevant national institutions should be invited to report to the Subcommittee on the activities that they had carried out for young people.

17. The Working Group of the Whole agreed that the regional centres for space science and technology education, affiliated to the United Nations, including the Network of Space Science and Technology Education and Research Institutions for Central Eastern and South-Eastern Europe, should be invited to include activities for young people and should be requested to report on their accomplishments in that regard.

18. The Working Group of the Whole noted that the Youth Advisory Council, a voluntary body, had been established following a recommendation of the Space Generation Forum held during UNISPACE III and had been modelled after a similar council established within the framework of the United Nations Environment Programme and that the Subcommittee had heard a presentation by two representatives of the Council.

19. The Working Group of the Whole agreed that the Youth Advisory Council could be granted observer status with the Committee on the Peaceful Uses of Outer Space, in order to facilitate the participation of young people in cooperative space-related activities. The Working Group of the Whole noted with satisfaction that the Council would seek funding to provide student interns to assist the Office for Outer Space Affairs in carrying out activities for young people within the United Nations Programme on Space Applications.

20. The Working Group of the Whole recommended that the Youth Advisory Council be invited to make a presentation on its activities at the thirty-eighth session of the Subcommittee, in 2001.

4. Celebration of World Space Week from 4 to 10 October

21. The Working Group of the Whole noted that the General Assembly in its resolution 54/68 had declared "World Space Week" from 4 to 10 October to celebrate each year at the international level the contributions of space science and technology to the betterment of the human condition.

22. The Working Group of the Whole noted with satisfaction that some Member States had already planned activities to contribute to the celebration of World Space Week. The Working Group of the Whole also noted with satisfaction that the Spaceweek International Association, an independent non-profit organization established in 1981 to coordinate public events celebrating a space week in March, had decided to change the date of its space week and had offered to assist the Office for Outer Space Affairs in coordinating events at the international level to celebrate World Space Week.

23. The Working Group of the Whole recommended that the Office for Outer Space Affairs should develop, in consultation with interested Member States and with the assistance of the Spaceweek International Association, a plan to celebrate World Space Week, for consideration by the Committee on the Peaceful Uses of Outer Space at its forty-third session, in 2000. The Working Group of the Whole also recommended that the Office for Outer Space Affairs should bring the decision of the General Assembly to the attention of space-related intergovernmental and non-governmental organizations, in particular the International Astronautical Federation, which would be organizing its Congress during World Space Week.

5. Trust Fund for the United Nations Programme on Space Applications and new and innovative funding sources to implement the recommendations of UNISPACE III

24. The Working Group of the Whole noted that the Vienna Declaration had called for a special voluntary fund for the purpose of implementing the recommendations of UNISPACE III, in particular the activities of the regional centres for space science and technology education.

25. The Working Group of the Whole noted that the General Assembly, in its resolution 54/68, had agreed that

the Committee on the Peaceful Uses of Outer Space and its secretariat should identify new and innovative funding sources for implementing the recommendations of UNISPACE III in order to supplement the resources to be provided through the Trust Fund for the United Nations Programme on Space Applications. In addition to the resources provided through the Trust Fund, support could be provided to the regional centres for space science and technology education and to the Network of Space Science and Technology Education and Research Institutions for Central Eastern and South-Eastern Europe by existing government and international financial institutions with development aid programmes, industry, space agencies, universities and specialized space-related institutions, including the United Nations specialized agencies.

26. The Working Group of the Whole noted that the Secretariat had provided suggestions on possible sources of funding for the regional centres and the Network (A/AC.105/C.1/2000/CRP.12). Industry could provide support by:

(a) Donating computer equipment, basic software licences, image-processing and Geographic Information System software and receivers of satellite positioning signals for various applications for education and for the implementation of pilot projects, and other equipment and material used for education and training in remote sensing, satellite meteorology, satellite communications and space sciences;

(b) Entering into mutually beneficial partnerships (e.g. financially supporting the institutions, thus enabling them to prepare qualified users of specific space technologies);

(c) Providing speakers at workshops organized by the regional centres and the Network.

27. Governments and international development financial institutions could provide support for the regional centres and the Network through programmes providing development aid to developing countries. The aid could be provided in several forms (e.g. financial aid, experts, education and equipment). Priorities for awarding aid could be established on the basis of diverse criteria (e.g. to developing countries from particular regions or subregions, to protect the environment and to promote health-related education). Where such development programmes existed and within existing budgetary resources and on the basis of the criteria referred to above, some funds could be earmarked for the regional centres and the Network. Governments of States members of the regional centres or the Network could discuss, within the framework of the governing bodies, the respective centres and institutions, ways and means of supporting the regional centres and the Network.

28. Space agencies, universities and specialized space-related institutions could provide support for the regional centres and the Network by: (a) providing experts, for periods of between one week and a few months, who could teach specialized parts of the education programmes at the regional centres or the institutions of the Network; (b) defraying the cost of limited amounts of data for education, training and the implementation of pilot projects; (c) organizing at the regional centres and the institutions of the Network, in coordination with the centres and the institutions concerned, workshops on the subjects in the long-term education programmes; (d) providing educational material (e.g. training kits, brochures and CD-ROMs) already produced by them; and (e) sponsoring individual pilot projects that would be part of the education programme of the regional centres and the Network.

29. A second broad category of support that would facilitate the participation of developing countries in the implementation of the recommendations of UNISPACE III would be the development of institutional capacity to use space technologies in operational programmes. The United Nations Programme on Space Applications would organize workshops, meetings of experts and training courses leading to pilot projects for incorporating and testing space technology in simulated or real operational programmes. Support could be provided through the following: (a) technical assistance in identifying user requirements and all the necessary steps that would need to be taken to introduce those technologies operationally; (b) limited amounts of optical and radar data for pilot projects with an Earth observation component (e.g. environmental assessment and monitoring, management of natural resources and disaster management); (c) free access for small amounts of transmission time through communications satellites for pilot projects with a communications component (e.g. telemedicine, tele-education and disaster management); and (d) establishment of programmes for the exchange of "visiting" personnel between institutions using space technologies on an operational basis and institutions implementing their use.

30. The Working Group of the Whole recommended that the Office for Outer Space Affairs should make the information contained in conference room paper

A/AC.105/C.1/2000/CRP.12 available to Member States and intergovernmental and non-governmental organizations, as well as industry, through such means as its web site (http://www.un.or.at/OOSA).

6. Identification and promotion of the use of appropriate space technologies to meet the needs of programmes and organizations of the United Nations system

31. The Working Group of the Whole noted that the General Assembly, in its resolution 54/68, had requested all relevant organizations of the United Nations system to take appropriate measures to ensure the full and effective implementation of the recommendations of UNISPACE III, taking into account the needs of developing countries, in particular by further enhancing the coordination of their space-related activities through the Inter-Agency Meeting on Outer Space Activities.

32. The Working Group of the Whole noted that the Inter-Agency Meeting on Outer Space Activities at its twentieth session, held in Vienna from 2 to 4 February 2000, had recommended that the Committee on the Peaceful Uses of Outer Space should establish a working group to consider, in particular, the coordination of outer space activities within the United Nations system, taking fully into account the annual report of the Secretary-General on the subject. The Working Group of the Whole also noted that the Inter-Agency Meeting had agreed that its work should be brought more prominently to the attention of the heads of organizations of the United Nations system and that the Office for Outer Space Affairs should explore the possibility of requesting the Administrative Committee on Coordination to resume its consideration of the agenda item on the coordination of the space-related activities of the United Nations system. The Working Group of the Whole welcomed the agreement of the Inter-Agency Meeting to consider at its twenty-first session, in 2001, an item entitled "Methods to strengthen further the inter-agency coordination and cooperation in space-related activities" (A/AC.105/727, paras. 30, 31 and 34).

33. The Working Group of the Whole had before it a proposal submitted by Canada, on behalf of Australia, Austria, India, the Russian Federation and the United States of America (A/AC.105/C.1/2000/CRP.3/Rev.1). According to the proposal, the Scientific and Technical Subcommittee would undertake a multi-year work plan to examine means of and mechanisms for strengthening inter-agency cooperation and increasing the use of space applications and services among the organizations of the United Nations system. The Working Group of the Whole agreed that an item reflecting the proposal by Canada should be included in the draft provisional agenda for the thirty-eighth session of the Subcommittee.

7. Strengthening of the activities of the United Nations Programme on Space Applications

34. The Working Group of the Whole noted that the General Assembly, in its resolution 54/68, had requested the Secretary-General to recommend measures to ensure that the Office for Outer Space Affairs was provided with adequate resources to implement certain actions, including strengthening of the activities of the United Nations Programme on Space Applications.

35. With regard to the support to be provided by the United Nations Programme on Space Applications to the regional centres for space science and technology education, affiliated with the United Nations, including the Network of Space Science and Technology Education and Research Institutions of Central Eastern and South-Eastern Europe, the Working Group of the Whole agreed that the regional centres should be invited to report to it, through the Office for Outer Space Affairs, on their accomplishments, including the list of courses held, the number of participants in their courses, progress made in implementing the recommendations of UNISPACE III and the accomplishments of course participants following the completion of the courses.

36. Regarding the organization of an annual public forum to inform the general public of space activities, the Working Group of the Whole agreed that the symposia and technical presentations organized during the annual session of the Subcommittee provided opportunities for the general public to be informed of recent developments in space activities by the participants. The Working Group of the Whole also agreed that the United Nations Information Service of the United Nations Office at Vienna should be requested to arrange for relevant public events in advance.

37. With regard to the programmes to be initiated to promote the use of satellite communications and Earth observation data for disaster management, the Working Group of the Whole agreed that the use of such data should also be promoted for the protection of the environment.

B. Draft provisional agenda of the Scientific and Technical Subcommittee at its thirty-eighth session, in 2001

38. The Working Group of the Whole noted that the General Assembly, in its resolution 54/67, had welcomed the new approach taken by the Committee on the Peaceful Uses of Outer Space in composing the agenda of the Scientific and Technical Subcommittee.[b] The Working Group of the Whole also noted that, in accordance with resolution 54/67, the Subcommittee would submit its proposal to the Committee for a draft provisional agenda for the thirty-eighth session of the Subcommittee, in 2001.

39. The Working Group of the Whole had before it proposals submitted by Canada on behalf of Australia, Austria, India, the Russian Federation and the United States (A/AC.105/C.1/2000/CRP.3/Rev.1), by China, India and Morocco (A/AC.105/C.1/2000/CRP.7) and by Japan (A/AC.105/C.1/2000/CRP.11) for agenda items to be considered under work plans. The Working Group of the Whole noted that an item entitled "Regional implications of global climate change" had been proposed by Egypt and items entitled "International cooperation in the use of space systems for global search and rescue" and "Government and private activities to promote education in space science and engineering" had been proposed by the United States for inclusion in the agenda of the Subcommittee as single issues and items for discussion. As for the specific subject for the item on space debris to be considered in 2001, the Working Group of the Whole noted that the United States, in a working paper entitled "Proposal for consideration of matters related to space debris by the Scientific and Technical Subcommittee" (A/AC.105/C.1/L.236), had proposed "Launch vehicle orbital debris mitigation practices" and that Germany had proposed "Cost-benefits of debris mitigation measures" (A/AC.105/C.1/L.238), while Italy had proposed "International cooperation in human spaceflight" as a regular item, to be considered at every session of the Subcommittee. The Working Group of the Whole also had before it a conference room paper submitted by Canada, France, Germany, Greece, Italy, Japan, the Russian Federation and the United States concerning the continuation of work on space debris in 2001 (A/AC.105/C.1/2000/CRP.18).

40. The Working Group of the Whole agreed that a new item, entitled "Means and mechanisms for strengthening inter-agency cooperation and increasing the use of space applications and services within the United Nations system and among United Nations specialized agencies and bodies", should be considered by the Subcommittee commencing with its session in 2001 according to the following three-year work plan:

2001 An analysis of the current levels of usage of space applications and services within the United Nations system, including one day for presentations by appropriate United Nations entities and Member States that undertake cooperative activities with those entities; and an examination of the utility of space applications and services for increasing, with regard to space activities, the effectiveness, efficiency and coordination of the operations of United Nations entities

2002 An identification of the barriers to greater use of space applications and services within the United Nations system and an examination of specific means and mechanisms to eliminate those barriers

2003 The development of specific and concrete proposals and, as appropriate, action plans for strengthening inter-agency cooperation in the use of space within the United Nations system and for increasing the use of space applications and services within the system in general and among particular United Nations entities

The Working Group of the Whole agreed that, at its forty-third session, in 2000, the Committee should recommend to the General Assembly at its fifty-fifth session that it request all United Nations entities concerned to provide the Office for Outer Space Affairs with appropriate information in response to a list of questions that the Office would prepare for approval by the Committee at its forty-third session, with the objective of increasing the effectiveness, efficiency and coordination of the space activities of the agencies and bodies of the United Nations system.

41. The Working Group of the Whole agreed that a new item, entitled "Implementation of an integrated, space-based global natural disaster management system", should be considered by the Subcommittee commencing with its session in 2001 according to the following three-year work plan:

2001 Review of the types of natural disasters being faced and the extent of the application of space-based services being utilized for their mitigation (Different countries are to be invited to make presentations on the subject.)

2002 Review of existing and proposed satellite and data distribution systems that can be used operationally for disaster management and identification of gaps in those systems
(The review could also extend to pilot projects undertaken by various space agencies, international organizations and Governments through technical presentations. The Committee on Earth Observation Satellites and others could be invited to make presentations on their efforts and studies.)

2003 Review of possible global operational structures to handle natural disaster management, making maximum use of existing and planned space systems

The Working Group of the Whole recommended that the Secretariat invite Member States and international organizations to submit to the Subcommittee at its thirty-eighth session information on the subject to be discussed at that session in accordance with the above work plan.

42. The Working Group of the Whole recommended the following as the draft provisional agenda for the thirty-eighth session of the Subcommittee:

1. General exchange of views and introduction to reports submitted on national activities.
2. United Nations Programme on Space Applications following the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
3. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
4. Items to be considered under work plans:
   (a) Use of nuclear power sources in outer space
   (Second year of the work plan: review of national and international processes, proposals and standards and national working papers relevant to the launch and peaceful use of nuclear power sources in outer space[c]);
   (b) Means of and mechanisms for strengthening inter-agency cooperation and increasing the use of space applications and services within and among entities of the United Nations system
   (First year of the work plan: an analysis of the current levels of usage of space applications and services within the United Nations system, including one day for presentations by appropriate United Nations entities and Member States that undertake cooperative activities with those entities; and an examination of the utility of space applications and services for increasing, with regard to space activities, the effectiveness, efficiency and coordination of the operations of United Nations entities);
   (c) Implementation of an integrated, space-based global natural disaster management system
   (First year of the work plan: review of the types of natural disasters being faced and the extent of the application of space-based services being utilized for their mitigation. (Different countries are to be invited to make presentations on the subject.)).
5. Single issues/items for discussion:
   (a) Space debris:
   (i) Consistent with paragraph 370 of the report of UNISPACE III,[a] stating that the Committee on the Peaceful Uses of Outer Space should give attention to various aspects of space debris, the Scientific and Technical Subcommittee should continue its work on the topic of space debris in 2001;
   (ii) It is proposed that, without prejudice to the work on this topic in other forums, the Scientific and Technical Subcommittee should, in particular, examine the question of the costs and benefits of debris mitigation measures. As part of this examination, Member States could report on:
      a. The costs of various debris mitigation measures;

b. The consequences, including the economic aspects, of taking no debris mitigation measures;

c. An analysis of the costs and benefits in various debris mitigation scenarios;

(iii) For the thirty-eighth session of the Scientific and Technical Subcommittee, in 2001, the passivation and limitation of mission-related space debris for launch vehicles, including the above-named cost-benefit aspects, would be a suitable subject;

(b) Examination of the physical nature and technical attributes of the geostationary orbit and its utilization and applications, including in the field of space communications, as well as other questions relating to development in space communications, taking particular account of the needs and interests of developing countries;

(c) Government and private activities to promote education in space science and engineering.

6. Draft provisional agenda of the Scientific and Technical Subcommittee at its thirty-ninth session, in 2002, including identification of subjects to be dealt with as single issues/items for discussion or under multi-year work plans.

7. Report to the Committee on the Peaceful Uses of Outer Space.

43. The Working Group of the Whole noted that the following items had also been proposed for inclusion in the agenda for the thirty-eighth session of the Scientific and Technical Subcommittee as single issues/discussion items: (a) international cooperation in human spaceflight (proposal by Italy); (b) international cooperation in the use of space systems for global search and rescue (proposal by the United States); and (c) regional implications of global climate change (proposal by Egypt). The Working Group of the Whole recommended that at the thirty-eighth session of the Subcommittee, those items should be considered for possible inclusion in the agenda for the thirty-ninth session of the Subcommittee, to be held in 2002.

44. The Working Group of the Whole recommended that the Committee on Space Research and the International Astronautical Federation, in liaison with Member States, should be invited to arrange a symposium on the theme "Terrestrial hazards from outer space objects and phenomena" with as wide a participation as possible, to be held during the first week of the thirty-eighth session of the Subcommittee.

C. Other matters

45. The Working Group of the Whole recommended that a colloquium on the theme "The human dimension in space science and technology applications" should be organized during the forty-fourth session of the Committee on the Peaceful Uses of Outer Space, in 2001, with the participation of eminent scientists, sociologists and philosophers and others.

46. The Working Group of the Whole recommended that it be reconvened during the thirty-eighth session of the Scientific and Technical Subcommittee.

Notes

[a] *Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999* (United Nations publication, Sales No. E.00.I.3).

[b] *Official Records of the General Assembly, Fifty-fourth Session, Supplement No. 20* (A/54/20), annex I, sect. A.

[c] A/AC.105/697 and Corr.1, annex III, appendix.

Annex III

Report of the Working Group on the Use of Nuclear Power Sources in Outer Space

1. At its 536th meeting, on 14 February 2000, the Scientific and Technical Subcommittee re-established its Working Group on the Use of Nuclear Power Sources in Outer Space under the chairmanship of Sam A. Harbison (United Kingdom of Great Britain and Northern Ireland).

2. The Working Group had before it the following documents: a note by the Secretariat entitled "National research on space debris, safety of nuclear-powered satellites and problems of collisions of sources with space debris" (A/AC.105/731); two working papers submitted by the Russian Federation, entitled "Collisions between nuclear power sources and space debris" (A/AC.105/C.1/L.233) and "Identification of terrestrial processes and technical standards with a possible relevance to nuclear power sources, including factors distinguishing the use of nuclear power sources in outer space from terrestrial nuclear power applications" (A/AC.105/C.1/L.234); a working paper submitted by the United Kingdom entitled "Technical processes and technical standards relevant to nuclear power sources in space: the position of the United Kingdom of Great Britain and Northern Ireland" (A/AC.105/C.1/L.231); and a working paper submitted by the United States of America entitled "Review of safety processes and standards for the United States space and terrestrial nuclear power systems" (A/AC.105/C.1/L.229).

3. The Working Group also took into account the information provided in the technical presentations on this subject made to the Scientific and Technical Subcommittee by representatives of various member States and the International Atomic Energy Agency (IAEA), reflected in paragraph 23 of the report of the Subcommittee.

4. At the first meeting of the Working Group, on 15 February 2000, its Chairman recalled the tasks before the Working Group and the work plan of its deliberations for developing a framework of safety assurance processes and standards for nuclear power sources in outer space (A/AC.105/697 and Corr.1, annex III, appendix), approved by the Scientific and Technical Subcommittee at its thirty-fifth session. In accordance with the work plan, the Working Group in 2000 was to identify terrestrial processes and technical standards that might be relevant to nuclear power sources, including factors distinguishing nuclear power sources in outer space from terrestrial nuclear applications.

5. The Working Group identified the following classes of terrestrial (including marine) processes that might have relevance to nuclear power sources in outer space: (a) nuclear reactors (stationary and mobile); (b) packaging and transport of radioactive materials; and (c) use of radioactive sources in terrestrial applications. The Working Group agreed to carry out a more in-depth assessment of the relevance of each of the processes.

6. The Working Group identified the following international documents that might be relevant to the safety of nuclear power sources in outer space:

(a) The provisions of the Convention on Nuclear Safety,[a] the Convention on Early Notification of a Nuclear Accident[b] and the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;[c]

(b) The recommendations of the International Commission on Radiological Protection;

(c) The relevant Safety Series publications of IAEA;

(d) The reports of the United Nations Scientific Committee on the Effects of Atomic Radiation.

The Working Group agreed that a review of those documents should be carried out within the context of the second year of its work plan in order to identify with more specificity those documents or parts of documents which might be of particular relevance to nuclear power sources in outer space. The Working Group welcomed the offer of IAEA to conduct a preliminary review of the documents and requested the Agency to report on the matter at the thirty-eighth session of the Scientific and Technical Subcommittee, in 2001.

7. The Working Group noted differing approaches in national standards relevant to terrestrial nuclear power sources that had been indicated through the comprehensive reports of certain member States. However, the Working

Group agreed that a significant commonality existed among the various national approaches through their application of and adherence to the provisions of the Convention on Nuclear Safety and the IAEA Safety Fundamentals developed in support of the Convention. The Working Group therefore agreed that a detailed examination of the Convention on Nuclear Safety and the related IAEA documents, particularly the Safety Fundamentals, should be undertaken within the framework of the second year of its work plan.

8. The Working Group agreed that the extent of differences and similarities between the use of nuclear power sources in outer space and terrestrial nuclear applications depended upon the specific nature of the applications in each case. The Working Group therefore noted a number of aspects that warranted further consideration in order to identify the extent to which those aspects might be relevant to the use of nuclear power sources in outer space, including:

(a) Nature of the applications;

(b) Operating environment;

(c) Nature and autonomy of operation of systems;

(d) Quantity of the radioactive material;

(e) Frequency and duration of use;

(f) Distance to, and the effects of normal operation and potential accidents on, populated areas;

(g) Complexity and designed reliability of systems;

(h) Use of passive and/or active systems;

(i) End of service.

9. The Working Group noted that there might be advances in technology and applications of nuclear power sources in outer space that had not yet been developed or envisaged. Reference was made to the multi-year work plan, according to which the review of safety processes and standards would be conducted to provide for the broadest range of existing and future radioisotope power and nuclear reactor power applications (e.g. applications on other celestial bodies such as the Moon).

10. The Working Group agreed that it would be useful, in accordance with the agreed work plan, for representatives of launching States to present at the thirty-eighth session of the Subcommittee, in 2001, a detailed review of the processes carried out to obtain final launch approval in their countries.

11. The Working Group noted that some of the specific proposals in one of the working papers submitted by the Russian Federation (A/AC.105/C.1/L.234) concerning possible amendment of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space (adopted by the General Assembly in its resolution 47/68 of 14 December 1992) should be reserved for possible consideration after completion of the work plan.

12. The Working Group on the Use of Nuclear Power Sources in Outer Space recommended that it be reconvened during the thirty-eighth session of the Scientific and Technical Subcommittee.

Notes

[a] International Atomic Energy Agency, "Convention on Nuclear Safety" (INFCIRC/449).

[b] United Nations, *Treaty Series*, vol. 1439, No. 24404.

[c] Ibid., vol. 1457, No. 24643.