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## **Report of the Scientific and Technical Subcommittee on its forty-ninth session, held in Vienna from 6 to 17 February 2012**

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## I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its forty-ninth session at the United Nations Office at Vienna from 6 to 17 February 2012, under the chairmanship of Félix Clementino Menicocci (Argentina).
2. The Subcommittee held 19 meetings.

### A. Attendance

3. Representatives of the following 56 member States of the Committee attended the session: Algeria, Argentina, Australia, Austria, Azerbaijan, Belgium, Bolivia (Plurinational State of), Brazil, Burkina Faso, Canada, Chile, China, Colombia, Cuba, Czech Republic, Ecuador, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kazakhstan, Kenya, Lebanon, Libya, Malaysia, Mexico, Morocco, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of) and Viet Nam.
4. At its 758th meeting, on 6 February, the Subcommittee decided to invite, at their request, observers for Costa Rica, the Dominican Republic, El Salvador, Israel, Jordan and the United Arab Emirates to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status. The Subcommittee took note of the applications by Costa Rica and Jordan for membership in the Committee (A/AC.105/C.1/2012/CRP.19 and A/AC.105/C.1/2012/CRP.7, respectively).
5. At the same meeting, the Subcommittee decided to invite, at its request, the observer for the European Union to attend the session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that doing so would not involve any decision of the Committee concerning status.
6. Observers for the International Atomic Energy Agency (IAEA), the International Telecommunication Union (ITU), the World Health Organization (WHO) and the World Meteorological Organization (WMO) attended the session.
7. The session was attended by observers for the following intergovernmental organizations with permanent observer status with the Committee: Asia-Pacific Space Cooperation Organization (APSCO), Association of Remote Sensing Centres in the Arab World (ARSCAW), European Organisation for Astronomical Research in the Southern Hemisphere (ESO), European Space Agency (ESA), European Telecommunications Satellite Organization (EUTELSAT-IGO), International Mobile Satellite Organization (IMSO) and Regional Centre for Remote Sensing of North African States (CRTEAN).

8. The session was also attended by observers for the following non-governmental organizations (NGOs) having permanent observer status with the Committee: Association of Space Explorers (ASE), EURISY, European Space Policy Institute (ESPI), International Academy of Astronautics (IAA), International Association for the Advancement of Space Safety (IAASS), International Astronautical Federation (IAF), International Astronomical Union (IAU), International Institute of Space Law (IISL), International Society for Photogrammetry and Remote Sensing (ISPRS), International Space University (ISU), Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Secure World Foundation (SWF), Space Generation Advisory Council (SGAC) and World Space Week Association (WSWA).

9. At its 758th meeting, on 6 February, the Subcommittee decided to invite, at its request, the observers for the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP) to attend the session and to address it, as appropriate, on the understanding that doing so would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee regarding status. The Subcommittee took note of the application of SCOSTEP for permanent observer status with the Committee (A/AC.105/C.1/2012/CRP.20).

10. A list of the representatives of States, United Nations entities and other international organizations attending the session is contained in A/AC.105/C.1/2012/INF/41 and Corr.1.

## **B. Adoption of the agenda**

11. At its 758th meeting, on 6 February, the Subcommittee adopted the following agenda:

1. Adoption of the agenda.
2. Election of the Chair.
3. Statement by the Chair.
4. General exchange of views and introduction of reports submitted on national activities.
5. United Nations Programme on Space Applications.
6. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
7. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
8. Space debris.
9. Space-system-based disaster management support.
10. Recent developments in global navigation satellite systems.
11. Use of nuclear power sources in outer space.

12. Near-Earth objects.
13. International Space Weather Initiative.
14. Long-term sustainability of outer space activities.
15. 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 developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.
16. Draft provisional agenda for the fiftieth session of the Scientific and Technical Subcommittee.
17. Report to the Committee on the Peaceful Uses of Outer Space.

### **C. Election of the Chair**

12. At its 758th meeting, the Subcommittee elected Félix Clementino Menicocci (Argentina) Chair for the period 2012-2013, pursuant to General Assembly resolution 66/71.

### **D. General statements**

13. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Austria, Azerbaijan, Brazil, Burkina Faso, Canada, Chile, China, Czech Republic, Cuba, Ecuador, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Kazakhstan, Kenya, Malaysia, Mexico, Nigeria, Pakistan, Philippines, Poland, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Switzerland, United States and Venezuela (Bolivarian Republic of). Statements were also made by the representative of South Africa on behalf of the Group of African States, and by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States. General statements were also made by the observers for El Salvador and the United Arab Emirates. The observers for ITU, WHO and WMO also made general statements. General statements were also made by the observers for APSCO, ARSCAW, ESA, IAA, IAF, IAU, ISU, SGAC, SWF and WSWA. A general statement was also made by the observer for SCOSTEP.

14. The Subcommittee welcomed the election of Félix Clementino Menicocci as Chair for a two-year term, starting in 2012. The Subcommittee expressed its appreciation to the outgoing Chair, Ulrich Huth (Germany), for his leadership and contribution to furthering the achievements of the Subcommittee during his term of office.

15. The Subcommittee welcomed Azerbaijan as the seventy-first member of the Committee on the Peaceful Uses of Outer Space, and ARSCAW was welcomed as the newest permanent observer of the Committee.

16. The Subcommittee conveyed its condolences to the peoples of Australia, Ethiopia, Japan, Kenya, the Philippines, Somalia and Thailand for the loss of lives and infrastructure caused by natural disasters that had occurred in those countries. The Subcommittee stressed the critical role that space-based systems and international space cooperation could play in supporting disaster management by providing accurate and timely information and communications support.
17. At the 758th meeting, the Chair made a statement outlining the work of the Subcommittee at its current session. The Chair emphasized the Declaration on the Fiftieth Anniversary of Human Space Flight and the Fiftieth Anniversary of the Committee on the Peaceful Uses of Outer Space, adopted by the General Assembly in its resolution 66/71, and stressed the need to strengthen the role of space science and technology for sustainable development and for meeting the challenges facing humanity.
18. Also at the 758th meeting, the Director of the Office for Outer Space Affairs of the Secretariat made a statement reviewing the work programme of the Office.
19. The Subcommittee noted that the ability of the Office for Outer Space Affairs to continue to deliver the same number of activities in a broad range of thematic areas as in the past would be possible only if the Office continued to attract the same level of cash and in-kind contributions.
20. The Subcommittee expressed its gratitude to Hans Haubold and Victor Kotelnikov of the Office for Outer Space Affairs, on the occasion of their retirement, for their dedication to the work of the Office and to the Committee, and wished them well in their future endeavours.
21. The Subcommittee noted the remarkable space-related events in 2012, including the fortieth anniversary of the Landsat series of satellites.
22. The Subcommittee congratulated ESA on the successful launch of the Vega launcher on 13 February 2012.
23. Some delegations reiterated the commitment of their countries to the peaceful use and exploration of outer space and emphasized the following principles: equal and non-discriminatory access to outer space and equal conditions for all States, irrespective of their level of scientific, technical and economic development; non-appropriation of outer space, including the Moon and other celestial bodies, by claim of sovereignty, use, occupation or any other means; non-militarization of outer space, and its exploitation strictly for the improvement of living conditions and peace on the planet; and regional cooperation to promote space activities as established by the General Assembly and other international forums.
24. Some delegations expressed the view that, given the impact of space activities on human life and the environment, there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to promote the establishment of binding international norms addressing issues such as space debris and the use of nuclear power sources in outer space, which are critical issues in the use and exploration of outer space.
25. Some delegations were of the view that developing countries should benefit from space technologies, in particular to support their social and economic

development, and that it was necessary to promote cooperation to facilitate data exchange and the transfer of technology among States.

26. The Subcommittee heard the following scientific and technical presentations:

(a) “Summary of APRSAF-18: A regional collaboration for tomorrow’s environment”, by the representative of Japan;

(b) “Space biomimetic biomining and applications”, by the representative of Germany;

(c) “The search for dark matter particles in space”, by the representative of the Russian Federation;

(d) “Into space for a better understanding of planet Earth: high-tech for future Earth observation satellites”, by the representative of Germany;

(e) “Presentation of CNES activities (50th anniversary)”, by the representative of France;

(f) “Megha Tropiques: India-France joint mission”, by the representative of India;

(g) “ASTROSAT”, by the representative of India;

(h) “Portuguese activities in space”, by the representative of Portugal;

(i) “PW-Sat: the first Polish satellite”, by the representative of Poland;

(j) “The Royal Jordanian Geographic Centre”, by the observer for Jordan;

(k) “Israel space programme: past, present and future”, by the observer for Israel.

27. The Subcommittee noted the screening of videos presented on the margins of the current session: “The launch of the Vega launcher”, by the representative of France, and “COSPAR Scientific Assembly in July 2012, in Mysore, India”, by the representative of India.

28. The Subcommittee expressed its gratitude to the Austrian Research Promotion Agency and ESPI for organizing a scientific and technical event on the margins of the current session.

## **E. National reports**

29. The Subcommittee took note with appreciation of the reports submitted by Member States (A/AC.105/1008 and Add.1 and A/AC.105/C.1/2012/CRP.8) for its consideration under agenda item 4, “General exchange of views and introduction of reports submitted on national activities”. The Subcommittee recommended that the Secretariat continue to invite Member States to submit annual reports on their space activities.

## **F. Symposium**

30. On 13 February, the Office for Outer Space Affairs held a symposium on the theme “The Earth observation services industry: market opportunities”, which was moderated by the Director of the Office for Outer Space Affairs. The presentations given at the symposium included the following: “Opportunities in Earth observation satellite services: lessons of the past for the future”, by Rachel Villain of Euroconsult; “The European EO service industries: development of the market and the impacts of GMES”, by Geoff Sawyer of the European Association of Remote Sensing Companies; “The Nigeria space programme and data challenges in Africa”, by Halilu Shaba of the National Space Research and Development Agency (NASRDA) of Nigeria; “Earth observation data in Brazil: CBERS data distribution and impact of open data policy”, by Geraldo Antonio Diniz Branco of Brazil; “The benefits of open availability of Landsat data”, by Jean Parcher of the United States Geological Survey; “The use of Russian space means of remote sensing of the Earth for the benefit of developing countries”, by Dmitry Gorobets of the Russian Federal Space Agency (Roscosmos); and “The EO services industry in support of decision-making towards sustainable development”, by Lorant Czaran of the Office for Outer Space Affairs.

## **G. Adoption of the report of the Scientific and Technical Subcommittee**

31. After considering the items before it, the Subcommittee, at its 776th meeting, on 17 February 2012, 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**

32. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 5, “United Nations Programme on Space Applications”.

33. At the 761st meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

34. The representative of Japan made a statement under agenda item 5. During the general exchange of views, statements relating to the item were also made by representatives of other member States and by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States and by the representative of South Africa on behalf of the Group of African States.

35. The Working Group of the Whole was reconvened under the chairmanship of S. K. Shivakumar (India), in accordance with paragraph 7 of General Assembly resolution 66/71. At its 774th meeting, on 16 February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.



36. The Subcommittee heard the following scientific and technical presentations:

(a) “Capacity-building in space science and technology: achievements of the African Regional Centre for Space Science and Technology Education — in English language (ARCSSTE-E)”, by the representative of Nigeria;

(b) “University Space Engineering Consortium (UNISEC) challenge: what we can do for capacity-building in space science and technology in developing countries”, by the representative of Japan;

(c) “Guidebook on small satellite programmes”, by the observer for ISU;

(d) “Status report on the United Nations/Japan Long-Term Fellowship Programme on Nanosatellite Technologies, hosted by Kyushu Institute of Technology, Japan: doctorate in nanosatellite technologies (DNST)”, by the representative of Japan;

(e) “Outcome of the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development, in 2011”, by the representative of Kenya;

(f) “BRITE: the first nanosatellite constellation”, by the representative of Austria.

## A. Activities of the United Nations Programme on Space Applications

37. The Subcommittee had before it the report of the Expert on Space Applications, outlining the mandate and orientation of the United Nations Programme on Space Applications (A/AC.105/1011, paras. 2-7). The Subcommittee noted that the Programme for 2011 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

38. The Subcommittee noted with appreciation the voluntary contributions (cash and in-kind) provided by various Member States and organizations for 2011 (A/AC.105/1011, paras. 51-52).

39. The view was expressed that Member States and international organizations should continue to support the Programme through voluntary contributions.

40. The Subcommittee noted that the priority areas of the Programme were: (a) environmental monitoring; (b) natural resources management; (c) global health; (d) disaster management; (e) global navigation satellite systems applications; (f) basic space science, including the International Space Weather Initiative; (g) space law; (h) climate change; (i) the Basic Space Technology Initiative (BSTI); and (j) the Human Space Technology Initiative (HSTI).

### 1. Year 2011

#### *Meetings, seminars, symposiums, training courses and workshops*

41. With regard to the activities of the United Nations Programme on Space Applications carried out in 2011, the Subcommittee expressed its appreciation to the following for co-sponsoring the various workshops, symposiums and training courses that had been held within the framework of the Programme, as referred to in

the report of the Expert on Space Applications (A/AC.105/1011, para. 48 and annex I):

(a) The Governments of Argentina, Austria, Iran (Islamic Republic of), Malaysia, Nigeria, South Africa, United Arab Emirates and Viet Nam;

(b) Developing Countries Support Programme, ESA, IAF, International Committee on Global Navigation Satellite Systems (ICG), ISPRS, Japan Aerospace Exploration Agency (JAXA), National Aeronautics and Space Administration of the United States (NASA), PSIPW, SWF and Space Environment Research Center (SERC) of Kyushu University, Japan.

*Long-term fellowships for in-depth training*

42. The Subcommittee expressed its appreciation to the Government of Italy, which, through the Politecnico di Torino and the Istituto Superiore Mario Boella and with the collaboration of the Istituto Elettrotecnico Nazionale Galileo Ferraris, had continued to provide four 12-month fellowships for postgraduate studies in global navigation satellite systems (GNSS) and related applications.

43. The Subcommittee expressed its appreciation to the Government of Japan, which, through the Kyushu Institute of Technology, provided two 3-year fellowships for postgraduate studies in nanosatellite technologies.

*Technical advisory services*

44. The Subcommittee noted with appreciation the technical advisory services provided under the United Nations Programme on Space Applications in support of activities promoting regional and international cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/1011, paras. 38-47).

## **2. Year 2012**

*Meetings, seminars, symposiums, training courses and workshops*

45. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops for 2012:

(a) United Nations/Latvia workshop on the applications of global navigation satellite systems, to be held in Riga from 14 to 18 May;

(b) United Nations expert meeting on HSTI, to be held in Vienna in June;

(c) United Nations/India training course on satellite-aided search and rescue, to be held in Bangalore, India in August;

(d) United Nations/Austria symposium on space-derived data analysis and image processing, to be held in Graz, Austria, in September;

(e) United Nations/IAF workshop on space technologies applied to the needs of humanity: lessons learned from cases in the Mediterranean area, to be held in Naples, Italy, from 28 to 30 September;

(f) United Nations/Ecuador workshop on the International Space Weather Initiative, to be held in Quito from 8 to 12 October;

(g) United Nations/Japan workshop on BSTI, to be held in Nagoya, Japan, from 10 to 13 October;

(h) United Nations/Chile workshop on space technology applications for socio-economic benefits, to be held in Santiago from 12 to 16 November;

(i) United Nations/Argentina workshop on space law, to be held in Argentina in November or December.

## **B. Regional and interregional cooperation**

46. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2010-2013 offered by the regional centres for space science and technology education, affiliated to the United Nations, was annexed to the report of the Expert on Space Applications (A/AC.105/1011, annex III).

47. The view was expressed that more participation was needed from the member countries of the Centre for Space Science and Technology Education for Asia and the Pacific (CSSTEAP).

48. The Subcommittee recalled that the General Assembly, in its resolution 66/71, had emphasized that regional and interregional cooperation in the field of space activities was essential to strengthen the peaceful uses of outer space, assist States in the development of their space capabilities and contribute to the achievement of the goals of the United Nations Millennium Declaration and, to that end, had requested relevant regional organizations to offer the assistance necessary so that countries could carry out recommendations of regional conferences; and that the Assembly had recognized, in that regard, the important role played by conferences and other mechanisms in strengthening regional and international cooperation among States, such as the African Leadership Conference on Space Science and Technology for Sustainable Development, the Asia-Pacific Regional Space Agency Forum (APRSAF), APSCO and the Space Conference of the Americas.

49. The Subcommittee noted that the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development, on the theme "Building a shared vision for space in Africa", had been hosted by the Government of Kenya in Mombasa from 26 to 28 September 2011. The Subcommittee noted that the proceedings of the Conference, including the Mombasa Declaration on Space and Africa's Development, would be posted on the website of the National Council for Science Technology of Kenya ([www.ncst.go.ke](http://www.ncst.go.ke)).

50. The Subcommittee noted that the eighteenth session of APRSAF had been held in Singapore from 6 to 9 December 2011. The theme of the session was "A regional collaboration for tomorrow's environment". The nineteenth session of the Forum would be jointly organized by the Government of Malaysia and the Government of Japan and be hosted by Malaysia in Kuala Lumpur from 11 to 14 December 2012.

51. The Subcommittee also noted that APSCO had held its fifth Council Meeting, in Beijing on 7 and 8 September 2011, at which it had approved a number of new projects and reviewed the progress being made on those approved earlier. The Subcommittee also noted that the sixth Council Meeting would be held in Tehran in May 2012.

52. The Subcommittee recalled the Pachuca Declaration, adopted by the Sixth Space Conference of the Americas, held in Pachuca, Mexico, from 15 to 19 November 2010, and noted that the pro tempore secretariat of the Conference would organize, in Mexico City from 17 to 20 April 2012, a regional meeting on the use of outer space in the areas of, inter alia, health, food security and climate change and, in July 2012, a meeting of the heads of space agencies to provide further impetus to the implementation of the recommendations of the Conference that had not yet been implemented.

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

53. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 6, “Implementation of the recommendations of the United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)”.

54. The representatives of Canada and Japan made statements under agenda item 6. During the general exchange of views, statements relating to the item were made by representatives of other member States.

55. The Subcommittee heard the following scientific and technical presentations:

(a) “Mapping of risks and resources in public health for decision support clients on mobile devices”, by the representative of Germany;

(b) “The view of Burkina Faso on tele-health and tele-epidemiology”, by the representative of Burkina Faso;

(c) “The educational programme for graduates of Iraqi universities realized by the Italian Ministry of Foreign Affairs and the School of Aerospace Engineering in Rome”, by the representative of Italy;

(d) “Tele-epidemiology and tele-health”, by the observer for WHO;

(e) “United Nations/Prince Sultan Bin Abdulaziz International Prize for Water International Water Portal”, by the observer for PSIPW;

(f) “Results from the Space Generation Congress 2011: perspectives from the next generation of international space sector leaders”, by the observer for SGAC.

56. The Subcommittee had before it the following:

(a) Note by the Secretariat on the contribution of the Committee on the Peaceful Uses of Outer Space to the United Nations Conference on Sustainable Development: harnessing space-derived geospatial data for sustainable development (A/AC.105/993);

(b) Note by the Secretariat containing the final report of the Action Team on Public Health: the use of space technology to improve public health (A/AC.105/C.1/L.305);

(c) Conference room paper containing submissions from Romania in its capacity as Chair of the Committee on the Peaceful Uses of Outer Space and from the Office for Outer Space Affairs of the Secretariat to the United Nations Conference on Sustainable Development (A/AC.105/C.1/2012/CRP.10).

57. The Subcommittee recalled that the General Assembly, in its resolution 66/71, had noted with satisfaction that a number of the recommendations set out in the Plan of Action of the Committee on the Peaceful Uses of Outer Space on the implementation of the recommendations of UNISPACE III (A/59/174, sect. VI.B) had been implemented and that satisfactory progress was being made in implementing the outstanding recommendations through national and regional activities.

58. The Subcommittee, in this regard, reiterated its appreciation for the flexible approach that had been adopted in implementing the recommendations of UNISPACE III. By making use of multi-year workplans and action teams, the Committee had been able to address a wide range of issues, thus enabling maximum implementation of those recommendations.

59. The Subcommittee noted that the Action Team on Public Health had held a meeting during the session, and noted, in this context, that continued discussions were needed on the use of space technology in the area of tele-epidemiology and tele-health to bring concrete benefits for meeting health needs. The Subcommittee therefore noted with appreciation the participation of WHO in its present session, and the proposal by Germany for the University of Landau to hold a workshop in 2012 on the subject of the application of space technology for public health.

60. The Subcommittee noted that the Action Team on Near-Earth Objects had held meetings during the session, and noted with appreciation the continued work of the Action Team and the Working Group on Near-Earth Objects on the Action Team's draft recommendations for an international response to the threat of near-Earth object impact.

61. The Working Group of the Whole, reconvened in accordance with General Assembly resolution 66/71, also considered agenda item 6. At its 774th meeting, on 16 February, the Subcommittee endorsed the recommendations of the Working Group of the Whole concerning the implementation of the recommendations of UNISPACE III, contained in annex I to the present report.

#### **IV. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment**

62. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 7, "Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment".

63. The representatives of China, Germany, India, Italy, Japan, the Russian Federation, the United States and Venezuela (Bolivarian Republic of) made

statements under the agenda item. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

64. The Subcommittee heard the following scientific and technical presentations:

(a) “Environmental satellite contributions to Global Earth Observing Programs”, by the representative of the United States of America;

(b) “Recent remote sensing activities in the Republic of Korea”, by the representative of the Republic of Korea;

(c) “Recent applications of RESOURCESAT-2”, by the representative of India;

(d) “Global applications of OCEANSAT-2”, by the representative of India;

(e) “Towards building national spatial data infrastructures for Pakistan”, by the representative of Pakistan.

65. In the course of the discussions, delegations reviewed national and cooperative programmes on remote sensing. Examples were given of national, bilateral, regional and international programmes to further socio-economic and sustainable development, notably in the following areas: agriculture and fishery; monitoring climate change; disaster management; hydrology; managing ecosystems and natural resources; monitoring air and water quality; mapping biodiversity resources, coastal zones, land use, wasteland and wetlands; oceanography; rural development and urban planning; and safety.

66. The Subcommittee noted with satisfaction that comprehensive, coordinated and sustained Earth observation systems were essential for the benefit of humankind and that significant efforts were being made to build the capacity of developing countries in using Earth observations to improve quality of life and advance their socio-economic development.

67. The Subcommittee noted the increased availability of space-based data at little or no cost, including the remote sensing data, made available free of charge, from the China-Brazil Earth resources satellites and from the Argentine Earth observation satellite SAC-C.

68. The Subcommittee took note of the number of continued launches of Earth observation satellites and the innovative research conducted using such satellites, data from which could be used to develop advanced, global-integrated Earth system models.

69. The Subcommittee recognized the important role played by organizations such as APRSAF and Sentinel Asia and its Space Applications for the Environment initiative, the Committee on Earth Observation Satellites (CEOS) and its virtual constellations for the Group on Earth Observations initiative, and the Group on Earth Observations (GEO) in promoting international and regional cooperation in the use of remote sensing technology, in particular for the benefit of developing countries.

70. The Subcommittee noted the progress made by GEO in the implementation of the Global Earth Observation System of Systems (GEOSS) and other initiatives, such as those on forest carbon tracking, climate and agriculture monitoring, development and integration of observation networks in cold regions and

capacity-building efforts towards expansion of access to and use of Earth observation in developing countries. The Subcommittee also noted the “GEOSS in the Americas” symposium, held in Santiago de Chile from 5 to 7 October 2011.

71. The Subcommittee noted the successful conclusion of the 25th plenary meeting of CEOS, hosted by Italy and held in Lucca, Italy, in November 2011, which resulted in the adoption of the Lucca Statement in support of climate change studies and sustainable development, and the development of a more integrated approach to disaster mitigation and management. The Subcommittee also noted that India had taken up the chairmanship of CEOS for 2012 and would host its next plenary meeting. The Subcommittee further noted that Brazil would host the next GEO plenary session, in November 2012.

72. The Subcommittee noted with satisfaction the fortieth anniversary of the launch of the Landsat series of satellites by the United States, representing the longest-running effort to acquire satellite imagery of the Earth. The Subcommittee further noted that during those four decades, millions of images had been acquired and archived in the United States and at Landsat receiving stations around the world, providing a unique and valuable source for a variety of uses, from climate change analysis to forestry management and emergency response.

73. The view was expressed that the free availability on the Internet of high-resolution imagery of sensitive areas was a point of concern, for strategic reasons.

## V. Space debris

74. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 8, “Space debris”.

75. The representatives of Canada, Chile, China, Germany, India, Indonesia, Italy, Japan, Poland, the Russian Federation, Saudi Arabia, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 8. During the general exchange of views, statements relating to the item were also made by representatives of other member States, by the representative of South Africa on behalf of the Group of African States and by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States. The observer for ESA also made a statement.

76. The Subcommittee heard the following scientific and technical presentations:

(a) “Presentation of CNES activities in the area of space debris”, by the representative of France;

(b) “Results of GEO and HEO space debris population research within the framework of the ISON international project in 2011”, by the representative of the Russian Federation;

(c) “US space debris environment and operational updates”, by the representative of the United States;

(d) “Swiss contributions to a better understanding of the space debris environment”, by the representative of Switzerland;

(e) “Space debris re-entry hazards”, by the observer for IAASS.

77. The Subcommittee had before it information on research on space debris, safety of space objects with nuclear power sources on board and problems relating to their collision with space debris, containing replies received from Member States and international organizations on the issue (A/AC.105/C.1/101, A/AC.105/C.1/2012/CRP.9 and A/AC.105/C.1/2012/CRP.11).

78. The Subcommittee noted with satisfaction that some States were implementing space debris mitigation measures consistent with the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space and/or the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines, and that other States had developed their own space debris mitigation standards based on those guidelines.

79. The Subcommittee noted with appreciation that States had adopted a number of approaches and concrete actions to mitigate space debris, including the improvement of the design of launch vehicles and spacecraft, the reorbiting of satellites, passivation, end-of-life operations and the development of specific software and models for space debris mitigation.

80. The Subcommittee also noted that research was being conducted in the areas of technology for space debris observation and continuous monitoring, space debris re-entry prediction, collision avoidance and collision probability modelling and technologies to protect space systems from space debris and to limit the creation of additional space debris.

81. The Subcommittee noted the technical collaboration of States in the area of space debris monitoring and mitigation, including through training and the joint use of facilities.

82. The Subcommittee noted the projects of some States in the field of active removal of space debris and, in this connection, their comprehensive studies on the long-term evolution of the space debris environment.

83. Some delegations were of the view that the mitigation of space debris and the limitation of its creation should be among the priorities of the Subcommittee’s work.

84. Some delegations were of the view that the issue of space debris should be addressed in a manner that would not jeopardize the development of space capabilities of developing countries.

85. Some delegations were of the view that all relevant information related to the re-entry of space debris into the Earth’s atmosphere should be reported diligently and expeditiously to countries that might be affected.

86. Some delegations were of the view that the sharing of high-quality data and technical know-how among spacefaring nations was essential for meaningful mitigation strategies and remediation measures.

87. Some delegations were of the view that the Subcommittee should consult IADC periodically to keep abreast of future revisions of the IADC Guidelines in the light of evolving technologies and debris mitigation practices.



88. The view was expressed that duplication in the work of the Subcommittee and IADC should be avoided.

89. Some delegations were of the view that developing countries should benefit from technical assistance in space debris monitoring provided by spacefaring nations.

90. The view was expressed that the cost of space debris mitigation measures should be shared by all space users equally in order to keep the business environment for space activities fair and competitive, and that the Committee and its subsidiary bodies could play an important role in promoting international coordination in matters related to space debris removal cost-sharing, ground risk acceptance and removal authorization.

91. The Subcommittee agreed that States, in particular spacefaring nations, should pay greater 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, including its re-entry into the atmosphere. It noted that the General Assembly, in its resolution 66/71, 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 and had agreed that international cooperation was needed to expand appropriate and affordable strategies to minimize the impact of space debris on future space missions. The Subcommittee agreed that research on space debris should continue and that Member States should make available to all interested parties the results of that research, including information on practices that had proved effective in minimizing the creation of space debris.

92. The Subcommittee agreed that Member States and space agencies should again be invited to provide reports on research on space debris, the safety of space objects with nuclear power sources on board and problems relating to the collision of such space objects with space debris.

93. Some delegations were of the view that reports on national research on space debris, safety of space objects with nuclear power sources on board and problems relating to their collision with space debris did not contain replies from the States that were largely responsible for creating space debris, including debris from platforms with nuclear power sources.

94. The view was expressed that it was necessary to continue improving the Space Debris Mitigation Guidelines of the Committee, and that the Scientific and Technical Subcommittee and the Legal Subcommittee should cooperate with the aim of developing legally binding rules relating to space debris.

95. The view was expressed that it was necessary to continue improving the Space Debris Mitigation Guidelines. The lack of clear requirements and the use of phrases such as “to the extent possible” provided a form of protection for those countries that had traditionally used technology without any restrictions or controls and, in some cases, without regard for human life or the environment.

## VI. Space-system-based disaster management support

96. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 9, “Space-system-based disaster management support”.

97. The representatives of Burkina Faso, China, India, Indonesia, Italy, Japan, Pakistan, Romania, the Russian Federation and the United States made statements under agenda item 9. During the general exchange of views, statements relating to the item were also made by representatives of other member States, by the representative of South Africa on behalf of the Group of African States, by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States and by the observer for APSCO.

98. The Subcommittee heard the following scientific and technical presentations:

- (a) “Disaster monitoring activities in Japan”, by the representative of Japan;
- (b) “Management of 2011 floods in Pakistan”, by the representative of Pakistan;
- (c) “The construction of risk scenarios combining remote sensing and physical models: the experience of the Italian pilot projects”, by the representative of Italy.

99. The Subcommittee had before it the following:

- (a) Report of the Secretariat on space-based information for crowdsource mapping (A/AC.105/1007);
- (b) Report of the Secretariat on technical advisory support activities carried out in 2011 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) (A/AC.105/1009);
- (c) Report on activities carried out in 2011 in the framework of UN-SPIDER (A/AC.105/1010);
- (d) Note by the Secretariat on UN-SPIDER: revised workplan for the biennium 2012-2013 (A/AC.105/C.1/2012/CRP.22);
- (e) Working paper submitted by the Russian Federation on the project to create the international global monitoring aerospace system (IGMASS) as a forward-looking new initiative in predicting and mitigating the consequences of natural and man-made disasters (A/AC.105/C.1/2012/CRP.23).

100. The Subcommittee expressed its appreciation for the efforts of the Office for Outer Space Affairs to bring the three reports on UN-SPIDER activities in 2011 to its attention, and noted with satisfaction the progress made with regard to all planned activities in the programme framework, including the continuing support provided through the programme for emergency response efforts during major disasters worldwide, such as the floods in Pakistan and the Philippines and the food-security crisis in the Horn of Africa.

101. The Subcommittee noted the renewed offers and commitments of Argentina, Indonesia and the Russian Federation to host UN-SPIDER regional support offices.

102. The Subcommittee noted with satisfaction the ongoing activities of Member States that were contributing to increasing the availability and use of space-based solutions in support of disaster management, and also supporting the UN-SPIDER programme, including the following: the Sentinel Asia project and its coordination of emergency observation requests through the Asian Disaster Reduction Centre (ADRC) and the Charter on Cooperation to Achieve the Coordinated Use of Space Facilities in the Event of Natural or Technological Disasters (also called the International Charter on Space and Major Disasters), as well as related efforts in the context of GEO to expand the provision of satellite data to a broader range of users; and the Mesoamerican Regional Visualization and Monitoring System (SERVIR).

103. The Subcommittee also took note of the expert contributions by Member States and regional support offices in 2011 to all UN-SPIDER technical advisory missions, as well as their sharing of experiences with other interested countries.

104. The Subcommittee noted that the Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters, jointly with the UN-SPIDER programme and with support from the Government of the Russian Federation, had organized in September 2011 an important international scientific workshop on space system-based disaster management support in Central Asia. Participants in the workshop included Russian specialists as well as representatives of disaster management agencies of Kazakhstan, Kyrgyzstan, Uzbekistan and international organizations.

105. The Subcommittee noted the wide interest and expert participation in the United Nations International Conference on Space-based Technologies for Disaster Risk Management event entitled “Best practices for risk reduction and rapid response mapping”, organized by UN-SPIDER with support from the Government of China and held in Beijing from 22 to 25 November 2011.

106. The Subcommittee noted with appreciation that the Government of Burkina Faso, together with UN-SPIDER experts and the Regional Centre for Training in Aerospace Surveys (RECTAS), had organized and hosted in Ouagadougou from 26 to 30 September 2011, a regional scientific workshop and high-level awareness-raising seminar for decision makers on the use of geospatial data for risk management and emergency response in case of floods.

107. The Subcommittee noted with appreciation that on 7 February, during the session of the Subcommittee, the Office for Outer Space Affairs had signed a cooperation agreement with the Gyongyos-based Károly Róbert University in Hungary to establish a regional support office, which would serve as a centre of expertise for the implementation of the UN-SPIDER programme.

108. The Subcommittee also congratulated Colombia on having established a regional support office, which demonstrated its support for the UN-SPIDER programme.

109. The Subcommittee welcomed the fact that UN-SPIDER regional support offices were currently being hosted by eight national organizations: Algerian Space Agency, Agustín Codazzi Geographic Institute of Colombia, Károly Róbert University of Hungary, Iranian Space Agency, Nigerian National Space Research and Development Agency, Pakistan Space and Upper Atmosphere Research Commission, Romanian Space Agency and National Space Agency of Ukraine; and

by four regional organizations: ADRC, based in Kobe, Japan; Regional Centre for Mapping of Resources for Development (RCMRD), based in Nairobi; University of the West Indies, based in Saint Augustine, Trinidad and Tobago; and Water Center for the Humid Tropics of Latin America and the Caribbean (CATHALAC) based in Panama City, bringing the total number of regional support offices to 12. It noted with appreciation the strong support of Member States for the development of space-based information for disaster management.

110. The Subcommittee noted with satisfaction the voluntary contributions that were being made by Member States, including cash contributions from Austria, China and Germany, and encouraged Member States to provide, on a voluntary basis, all support necessary, including financial support, to UN-SPIDER to enable it to carry out its workplan for the biennium 2012-2013.

111. Some delegations were of the view that it was important to intensify coordination and cooperation at the international level through cooperation programmes in the field of activities developed by UN-SPIDER, especially in developing countries.

112. The Working Group of the Whole, reconvened pursuant to General Assembly resolution 66/71, also considered agenda item 9. At its 774th meeting, on 16 February, the Subcommittee endorsed the report of the Working Group of the Whole, contained in annex I to the present report.

## **VII. Recent developments in global navigation satellite systems**

113. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 10, "Recent developments in global navigation satellite systems".

114. The representatives of China, India, Italy, Japan, the Russian Federation and the United States made statements under agenda item 10. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

115. The Subcommittee heard the following scientific and technical presentations:

- (a) "ICG-6 outcomes", by the representative of Japan;
- (b) "Global navigation satellite systems continuously operating reference stations of Indonesia (Ina-CORS)", by the representative of Indonesia;
- (c) "Recent developments in IRNSS", by the representative of India.

116. The Subcommittee had before it the following documents:

- (a) Report on the United Nations/United Arab Emirates/United States Workshop on Applications of Global Navigation Satellite Systems (GNSS) (A/AC.105/988);
- (b) Note by the Secretariat on the Sixth Meeting of ICG (A/AC.105/1000);
- (c) Report of the Secretariat on activities carried out in 2011 in the framework of the workplan of ICG (A/AC.105/1013).

117. The Subcommittee noted that the United Nations/United Arab Emirates/United States Workshop on Applications of Global Navigation Satellite Systems had been held in Dubai from 16 to 20 January 2011. The Emirates Institution for Advanced Science and Technology had hosted the Workshop on behalf of the Government of the United Arab Emirates. The Workshop was aimed at increasing awareness among decision makers and policymakers of the benefits of satellite navigation technology and establishing a broad framework for regional and international cooperation.

118. The Subcommittee noted that the United Nations International Meeting on the Applications of Global Navigation Satellite Systems, co-sponsored by the United States, had been hosted by the Office for Outer Space Affairs from 12 to 16 December 2011 in Vienna to mark 10 years of achievement of the United Nations in the area of GNSS, with the Office taking an active role as the executive secretariat of ICG and a co-organizer of the meeting. It was also noted that the establishment of international centres for GNSS science, technology and education in already existing institutions of higher learning was recommended, and that such international centres should promote and offer education in science, engineering and the application of GNSS for peaceful uses for the benefit of States.

119. The Subcommittee reviewed issues related to ICG and the latest developments in the field of GNSS technology and applications.

120. The Subcommittee noted with satisfaction that the Sixth Meeting of ICG and the seventh meeting of its Providers' Forum had been held in Tokyo from 5 to 9 September 2011, organized by the Government of Japan, and that the Seventh Meeting of ICG would be held in Beijing from 5 to 9 November 2012. The Subcommittee also noted that the United Arab Emirates would host the Eighth Meeting of ICG in 2013.

121. The Subcommittee noted that the Sixth Meeting of ICG had addressed GNSS technology applications to agriculture, fisheries, information technology construction (precision positioning), geographic information systems (GIS), disaster mitigation, intelligent transportation systems and location-based services. It was noted that experts from Indonesia, the Republic of Korea, Thailand and Viet Nam had participated in discussions with respect to user applications and GNSS technology.

122. The Subcommittee noted the progress made on the ICG workplan and the growing attention given by the international community to multi-GNSS system monitoring to improve performance and interoperability, as well as to interference detection and mitigation. It was noted that the ICG working groups focused on the following issues: compatibility and interoperability; enhancement of the performance of GNSS services; information dissemination and capacity-building; and reference frames, timing and applications.

123. The Subcommittee commended the Office for Outer Space Affairs for its work as the executive secretariat of ICG and its Providers' Forum, and for its efforts to create synergy among global players in satellite navigation.

124. The Subcommittee expressed its appreciation to the Office for Outer Space Affairs for its efforts in promoting the use of GNSS through its capacity-building initiatives in developing countries.

125. The Subcommittee noted with appreciation the achievements of providers and users of positioning, navigation and timing services in promoting GNSS, as reflected in the publication “10 years of achievement of the United Nations on Global Navigation Satellite Systems” (ST/SPACE/55).

126. The Subcommittee noted that the United States Global Positioning System (GPS) continued to set a high standard of reliability, accuracy and service to the international community. It was noted that GPS had 31 operational satellites in orbit to ensure a baseline constellation of 24+3 satellites. The entire GPS constellation continued performing at exceptional levels of accuracy, averaging a user range error of less than one metre. The Subcommittee also took note of the intention of the United States to maintain GPS as a central pillar of an emerging international system of GNSS.

127. The Subcommittee noted with appreciation the financial contributions made by the United States, which enabled the Office for Outer Space Affairs to undertake a number of activities relating to GNSS and ICG and its Providers’ Forum, including the organization of regional workshops on GNSS applications.

128. The Subcommittee noted that the Russian Federation’s Global Navigation Satellite System (GLONASS) constellation had been completed and currently consisted of 31 operational satellites in orbit to provide global coverage. It was also noted that a new generation of GLONASS-K satellites was scheduled to be launched to increase precision and operational capabilities.

129. The Subcommittee noted the successful launch of the first two Galileo in-orbit validation satellites of the European Union.

130. The Subcommittee noted that Italy continued to be an active member of ICG, having been one of the founders of the European EGNOS and Galileo satellite navigation system, and was developing national application projects aimed at fostering the use of satellite navigation and harmonizing them with European projects.

131. The Subcommittee noted that there had been a series of successful launches of China’s Beidou satellite navigation system and that the system had started providing initial positioning, navigation and timing services to China and surrounding areas. The Subcommittee also noted that China aimed to complete the global Beidou satellite navigation system by 2020, comprising 5 GEO and 30 non-GEO satellites.

132. The Subcommittee noted that India was currently implementing the GPS-aided GEO-Augmented Navigation System (GAGAN), a space-based augmentation system for delivering increased position accuracy for civil aviation applications. It was noted that GAGAN was compatible and interoperable with other satellite-based augmentation systems and that it would provide seamless navigation services together with other systems. The Indian Regional Navigation Satellite System, with seven satellites in geostationary equatorial orbit and geosynchronous orbit, was in the implementation phase, and the full constellation was expected to be completed in 2015.

133. The Subcommittee noted that the Quasi-Zenith Satellite System of Japan would be expanded and upgraded to an operational and regional satellite-based GNSS for the benefit of the countries in the Asia-Pacific region, that a four-satellite constellation would be established by the late 2020s and that in the future, a

seven-satellite constellation should be completed to enable sustainable positioning. It was noted that satellite positioning systems had been used for rescue, rehabilitation and reconstruction during the earthquake in Japan in 2011, and it was recognized that such space-based systems contributed to human security.

134. The Subcommittee noted that the third Asia-Oceania Regional Workshop on GNSS had been held in Jeju, Republic of Korea, on 2 and 3 November 2011 and that five multi-GNSS application experiments had been endorsed in that workshop as part of the multi-GNSS demonstration campaign.

135. The Subcommittee noted that the Czech Republic would host the European GNSS Agency and was participating in the GNSS Evolution Programme of ESA, which prepares technologies associated with future generations of the EGNOS and Galileo system.

## VIII. Use of nuclear power sources in outer space

136. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 11, "Use of nuclear power sources in outer space".

137. The representatives of the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 11. During the general exchange of views, statements relating to the item were also made by representatives of other member States, the representative of Ecuador on behalf of the Group of Latin American and Caribbean States and the representative of South Africa on behalf of the Group of African States.

138. The Subcommittee heard the following scientific and technical presentations:

(a) "The safety framework for nuclear power sources in outer space — current and planned applications, and challenges: issue of responsibility in the special case of ITER", by the representative of France;

(b) "European space nuclear power programme: UK activities", by the representative of the United Kingdom;

(c) "US space nuclear power program at 50 years", by the representative of the United States.

139. The Subcommittee encouraged States and international intergovernmental organizations to begin or to continue implementing the Safety Framework for Nuclear Power Source Applications in Outer Space (A/AC.105/934).

140. Some delegations were of the view that more missions enabled or enhanced by nuclear power sources (NPS) would be envisaged in the future and that the Safety Framework would facilitate the conduct of such missions on a bilateral and multilateral basis between States and international intergovernmental organizations. Those delegations were of the view that the widespread implementation of the Safety Framework would provide assurance to the global community that NPS applications were being developed, launched and used in a safe manner.

141. Some delegations expressed the view that more consideration should be given to the use of NPS in geostationary orbit and low Earth orbit in order to address the problem of potential collisions of NPS objects in orbit, as well as their accidental

re-entry into the Earth's atmosphere. Those delegations were of the view that more attention should be given to this matter through adequate strategies, long-term planning and regulations, including the Safety Framework for Nuclear Power Source Applications in Outer Space.

142. Some delegations expressed the view that it was exclusively States, irrespective of their level of social, economic, scientific or technical development, that had an obligation to engage in the regulatory process associated with the use of nuclear power sources in outer space and that the matter concerned all humanity. Those delegations were of the view that Governments bore international responsibility for national activities involving the use of nuclear power sources in outer space conducted by governmental and non-governmental organizations and that such activities must be beneficial, not detrimental, to humanity.

143. Some delegations were of the view that, in order to ensure the safe use of nuclear power sources, it would be important for space actors with proven capabilities in this field to make available to other States their know-how and information on measures taken to ensure the safety of objects using NPS.

144. The view was expressed that the use of nuclear power sources in outer space should be as limited as possible and that, while NPS were needed for some interplanetary missions, no justification existed for their use in terrestrial orbits, for which other sources of energy were available that were much safer and had been proved to be efficient. The delegation expressing that view also considered that the Sun was a source of energy that could effectively serve present and future needs of humankind in the areas of satellite applications, such as Earth observation, telecommunications, tele-health and tele-education.

145. The view was expressed that in using NPS in outer space, States should consider the limited nature of the near-Earth space environment.

146. The view was expressed that the workshops organized by the Working Group on the Use of Nuclear Power Sources in Outer Space promoted activities related to the use of NPS in outer space. The delegation expressing that view was also of the view that the proliferation of NPS in outer space, including terrestrial orbits, should not be allowed, as the effects of the use of NPS on humankind and the environment had not been assessed and there was no definite framework establishing responsibilities and introducing technical and legal tools that could effectively address critical situations that might arise because of undue practices.

147. The view was expressed that the Safety Framework was not adequate in its present form to meet the challenges posed by the use of NPS in outer space and that, in the regulation of the use of NPS in outer space, due consideration should be given to relevant norms of international law, the Charter of the United Nations and the United Nations treaties and principles on outer space. The delegation expressing that view also considered that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to develop binding legal instruments to define the responsibility of States in the use of nuclear power sources in outer space and to undertake research on the ways and means of optimizing or substituting for the use of nuclear energy in outer space activities.



148. The view was expressed that the application of NPS in space missions was important because it could help States to further the objectives of space exploration.

149. Pursuant to General Assembly resolution 66/71, the Working Group on the Use of Nuclear Power Sources in Outer Space was reconvened under the chairmanship of Sam A. Harbison (United Kingdom). The Working Group held three meetings.

150. The Subcommittee welcomed the holding of the workshop on the use of nuclear power sources in outer space in the afternoon of 8 February, during the first meeting of the Working Group.

151. At its 774th meeting, on 16 February, the Subcommittee endorsed the report of the Working Group, including the report on the above-mentioned workshop. The report of the Working Group is contained in annex II to the present report.

## IX. Near-Earth objects

152. In accordance with General Assembly resolution 66/71, the Scientific and Technical Subcommittee considered agenda item 12, "Near-Earth objects".

153. The representatives of Germany, Japan, Romania and the United States made statements under agenda item 12. During the general exchange of views, statements relating to the item were also made by representatives of other member States and by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States. The observer for IAU also made a statement.

154. The Subcommittee heard the following scientific and technical presentations:

(a) "Presentation of CNES activities in the area of near-Earth objects", by the representative of France;

(b) "Near-Earth Objects Observation Program: close approaches of 2011", by the representative of the United States;

(c) "NEOs, the media and risk communications: report on a workshop", by the observer for SWF.

155. The Subcommittee had before it the following documents:

(a) Information on research in the field of near-Earth objects carried out by Member States, international organizations and other entities (A/AC.105/C.1/100 and A/AC.105/C.1/2012/CRP.9);

(b) Interim report of the Action Team on Near-Earth Objects (2011-2012) (A/AC.105/C.1/L.316);

(c) Draft recommendations of the Action Team on Near-Earth Objects for an international response to the near-Earth object impact threat (A/AC.105/C.1/L.317).

156. The Subcommittee noted the increased awareness of the global threat posed by near-Earth objects and the importance of coordinated international efforts to mitigate such threats.

157. The Subcommittee noted with appreciation the international efforts undertaken by member States to detect, catalogue and characterize near-Earth objects, such as the Minor Planet Center; the Arecibo and Goldstone radio telescope facilities; the

NEO Program Office of NASA; NEOShield, which involved 13 governmental and non-governmental partners and would be coordinated by the German Aerospace Centre (DLR); and the Panoramic Survey Telescope and Rapid Response System (Pan-STARRS).

158. The Subcommittee noted the significant progress achieved by the United States in detecting 93 per cent (910 out of approximately 980) of near-Earth objects larger than one kilometre in diameter, which exceeded the initial target of 90 per cent detection. The Subcommittee also noted the objective of the United States NEO Survey Program to detect, track, catalogue and characterize 90 per cent of all near-Earth objects that are at least 140 metres in size by 2020.

159. The Subcommittee noted that JAXA had published the infrared astronomical satellite AKARI asteroid catalogue, containing 5,120 asteroids.

160. The Subcommittee noted the successful completion in February 2011 of the Wide-field Infrared Survey Explorer mission of the United States, which since its launch in December 2009 had observed more than 157,000 solar system objects, including 120 comets and more than 585 near-Earth objects.

161. The Subcommittee noted with satisfaction the successful conclusion of the first sample-return mission from a near-Earth object by the asteroid explorer Hayabusa of Japan, which had returned to Earth on 13 June 2010, and the importance of the results of that mission for scientific purposes, as well as for the future management of threats posed by near-Earth objects.

162. The Subcommittee welcomed upcoming sample-return missions, such as the Hayabusa-2 mission of Japan, to be launched in 2014 to arrive at the target near-Earth object in 2018, and the OSIRIS-REx sample-return mission of the United States, to be launched in 2016 and return to Earth in 2023.

163. The Subcommittee also welcomed the past and upcoming missions investigating near-Earth objects, including the Dawn mission of the United States, in which for the first time a spacecraft had entered orbit around an object in a main asteroid belt, a densely populated belt that is the source of most near-Earth objects.

164. The Subcommittee noted the launch of a Goliath nanosatellite of Romania on board the new European launcher Vega on 13 February 2012. The nanosatellite carried three scientific experiments on board, including one to measure the meteorite flux.

165. The Subcommittee noted with satisfaction that the 2011 IAA Planetary Defense Conference: From Threat to Action, co-organized by the Romanian Space Agency, had been held in Bucharest from 9 to 12 May 2011. The Subcommittee further noted that the Conference had resulted in a white paper summarizing the recommendations made by international experts to world space agencies and relevant institutions around the world to establish a framework for international decisions and coordinated actions to respond to an NEO threat, as well as to examine legal and policy issues that might affect the decision-making process. The Subcommittee further noted that progress on those issues would be discussed at the 2013 IAA Planetary Defense Conference, to be held in Flagstaff, Arizona, United States, in April 2013, hosted by the Planetary Science Division of NASA.

166. The Subcommittee noted that a number of international meetings to discuss international collaborative efforts on near-Earth objects had been held in Pasadena, California, United States, in August 2011, such as the second meeting of the International Primitive Body Exploration Working Group, a meeting of the United States Small Bodies Assessment Group and the Workshop on International Recommendations for NEO Threat Mitigation, organized by the Action Team on Near-Earth Objects.

167. The Subcommittee further noted that IAU had established in its Division III, on Planetary System Sciences, a Working Group on Near-Earth Objects, which would report to the XXVIII IAU General Assembly, to be held in Beijing in August 2012, to further promote support for near-Earth object surveys among IAU member States.

168. In accordance with General Assembly resolution 66/71, the Working Group on Near-Earth Objects was reconvened under the chairmanship of Sergio Camacho (Mexico). The Working Group held 4 meetings.

169. At its 775th meeting, on 16 February, the Subcommittee endorsed the report of the Working Group on Near-Earth Objects, which is contained in annex III to the present report.

## **X. International Space Weather Initiative**

170. In accordance with General Assembly resolution 66/71, the Scientific and Technical Subcommittee considered agenda item 13, “International Space Weather Initiative”, under the workplan contained in annex I to document A/AC.105/933.

171. The representatives of China, Japan, India, Pakistan, the Russian Federation and the United States made statements under agenda item 13. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

172. The Subcommittee heard the following scientific and technical presentations:

(a) “Long-term monitoring of total solar irradiance”, by the representative of Switzerland;

(b) “International Space Weather Initiative (update)”, by the representative of the United States.

173. The Subcommittee had before it a note by the Secretariat containing information received from Member States and observers on national and regional activities related to the International Space Weather Initiative (A/AC.105/C.1/102).

174. The Subcommittee noted that the objectives of the Initiative were to develop the scientific insight necessary to understand the solar-terrestrial relationships inherent in space weather, to reconstruct and forecast near-Earth space weather and to communicate that knowledge to scientists, engineers, policymakers and the general public.

175. The Subcommittee welcomed the fact that participation in the Initiative was open to all countries, as instrument hosts or as instrument providers. The Initiative is governed by a Steering Committee of 16 members, which meets once a year to

assess progress and provide prioritization for the upcoming year. National coordinators from 83 countries help to coordinate activities of the Initiative at the national level.

176. The Subcommittee noted that the Initiative consisted of three elements: the instrument array programme to operate and deploy space weather instruments; the data coordination and analysis programme to develop predictive models using Initiative data; and training, education and public outreach programmes. The Subcommittee also noted the initiatives implemented under those elements.

177. The Subcommittee further noted the inclusion of space weather issues by States in their national space programmes.

178. The Subcommittee noted that space weather events could have a significant disruptive impact on the infrastructure of countries located at lower latitudes, and that such countries could also become vulnerable owing to technological and economic interdependence and the growing importance of space assets in the delivery of vital services.

179. The view was expressed that through the Initiative, coordinated international research would continue on universal processes in the solar system that affected the interplanetary and terrestrial environments, and that there would be continued coordination in the deployment and operation of new and existing instrument arrays aimed at understanding and predicting the effects of space weather on the Earth and the near-Earth environment.

180. The Subcommittee noted with appreciation that information on the ground-based worldwide instrument arrays was being regularly distributed through a newsletter published by the Space Environment Research Centre of Kyushu University, Japan, and through the International Space Weather Initiative website, maintained by the Bulgarian Academy of Sciences ([www.iswi-secretariat.org](http://www.iswi-secretariat.org)).

181. The Subcommittee noted with appreciation that the Office for Outer Space Affairs continued to support the study of the effect of sudden disturbances on the ionosphere through the use of the sudden ionospheric disturbance monitor installed at its permanent outer space exhibit at the United Nations Office at Vienna.

182. The Subcommittee welcomed the fact that the United Nations Programme on Space Applications had organized the United Nations/Nigeria Workshop on the International Space Weather Initiative. The Workshop was co-organized with NASRDA of Nigeria, JAXA and Kyushu University of Japan, and was held in Abuja from 17 to 21 October 2011. The Subcommittee also welcomed the upcoming workshop, scheduled to take place in Quito from 8 to 12 October 2012, to be hosted by the Quito Astronomical Observatory on behalf of the Government of Ecuador.

## **XI. Long-term sustainability of outer space activities**

183. In accordance with General Assembly resolution 66/71, the Scientific and Technical Subcommittee considered agenda item 14, "Long-term sustainability of

outer space activities”, under the workplan contained in the report of the Committee on the Peaceful Uses of Outer Space on its fifty-second session.<sup>1</sup>

184. The representatives of Canada, China, Germany, Italy, Japan, the Russian Federation, the United States and Venezuela (Bolivarian Republic of) made statements under the item. During the general exchange of views, statements relating to the item were also made by representatives of other member States, as well as by the representative of Ecuador on behalf of the Group of Latin American and Caribbean States and by the representative of South Africa on behalf of the Group of African States.

185. The Subcommittee heard the following scientific and technical presentations:

(a) “Long-term monitoring of total solar irradiance”, by the representative of Switzerland;

(b) “Japan’s view on the ‘Long-term sustainability of outer space activities of the Scientific and Technical Subcommittee’”, by the representative of Japan;

(c) “CCSDS contribution to the long-term sustainability of outer space activities: German view”, by the representative of Germany;

(d) “Space situational awareness sharing agreements with governments and intergovernmental entities”, by the representative of the United States;

(e) “Active space debris removal: an essential mechanism for ensuring the sustainability of outer space”, by the observer for IAASS;

(f) “The global space situational awareness sensor database: a new tool for collaboration and cooperation”, by the observer for SWF.

186. The Subcommittee had before it the following:

(a) Note by the Secretariat on experiences and practices related to the long-term sustainability of outer space activities (A/AC.105/C.1/103 and Add.1);

(b) Conference room paper containing a list of points of contact for the Working Group on the Long-term Sustainability of Outer Space Activities, and members of expert groups A through D (A/AC.105/C.1/2012/CRP.12);

(c) Conference room papers containing full reports on experiences and practices related to the long-term sustainability of outer space activities received from member States and permanent observers of the Committee, as well as other international organizations and bodies (A/AC.105/C.1/2012/CRP.13, A/AC.105/C.1/2012/CRP.14 and A/AC.105/C.1/2012/CRP.15);

(d) Conference room paper containing the report of the International Interdisciplinary Congress on Space Debris entitled “Active debris removal — an essential mechanism for ensuring the safety and sustainability of outer space” (A/AC.105/C.1/2012/CRP.16);

(e) Conference room paper containing a report received from Ecuador (A/AC.105/C.1/2012/CRP.18);

<sup>1</sup> *Official Records of the General Assembly, Sixty-fourth Session, Supplement No. 20 (A/64/20)*, para. 161.

(f) Working paper submitted by the Russian Federation and Ukraine (A/AC.105/C.1/2012/CRP.21).

187. In accordance with General Assembly resolution 66/71, the Working Group on the Long-term Sustainability of Outer Space Activities was reconvened under the chairmanship of Peter Martinez (South Africa).

188. The Subcommittee welcomed the adoption of the terms of reference and methods of work of the Working Group on the Long-term Sustainability of Outer Space Activities at the meeting of the Committee on the Peaceful Uses of Outer Space in June 2011<sup>2</sup> and noted with appreciation that expert groups of the Working Group to address specific topics had been established and had initiated their work.

189. The Subcommittee noted the joint initiative of the Russian Federation and Ukraine in the field of the transfer and use of space technologies, as described in A/AC.105/C.1/2012/CRP.21, and that it had been presented for consideration by expert groups A and D.

190. The view was expressed that the significance of the topic of long-term sustainability of outer space activities, as well as its unique value to the Committee, should be emphasized, and it was suggested that the Office for Outer Space Affairs should provide more assistance and support for the work of the Working Group and its expert groups.

191. Some delegations expressed the view that the consideration of the long-term sustainability of outer space activities should not be used as a pretext for States that had been able to develop their space capabilities without control, resulting in the challenges faced today, to restrict or impose controls on other States wishing to exercise their legitimate right to use the same technology for their national benefit.

192. The view was expressed that States must ensure that outer space, as the heritage of mankind, was not used to favour commercial interests that undermined the social interests of humanity.

193. The view was expressed that all States, regardless of the level of their participation in space activities, and developing countries in particular, should participate actively in the work of the Working Group and its expert groups, in order for the Subcommittee to proceed with its deliberations pragmatically and effectively, while adhering to the principle of equality.

194. The view was expressed that the Subcommittee should align its work on the long-term sustainability of outer space activities with the objectives of maintaining the stability and safety of space activities, and that it was essential to take into consideration current political and strategic contexts, as well as the work done in other bodies on transparency and confidence-building measures in outer space.

195. The view was expressed that current practices, regulations and guidelines would not resolve some of the major problems relating to the sustainability of outer space activities facing all States today.

196. The view was expressed that the Subcommittee should focus on formulating consensus-based and targeted solutions, as well as political and technical options,

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<sup>2</sup> Ibid., *Sixty-sixth Session, Supplement No. 20 (A/66/20)*, annex II.

on the basis of best practices and experiences, including standards, rather than considering national regulations of individual States as models to be recommended.

197. Some delegations expressed the view that the Subcommittee should strive to reach consensus on voluntary best practices, guidelines and principles for space activities that could be implemented by spacefaring nations to reduce the risk to space operations for the benefit of all States.

198. The view was expressed that, in order to achieve sustainability of outer space activities, the development of binding norms should be promoted. It was further stressed that any measures or sets of guidelines that might be recommended should be consistent with international law, that the regulation of space activities remained the responsibility of States and that this responsibility was not transferable.

199. Some delegations expressed the view that special attention should be given to the space debris issue because of the need to advance international cooperation on such a sensitive question.

200. The view was expressed that the Subcommittee should not, in the context of space debris, focus on creating standards for space technology, but rather, at this stage, on the analysis of space debris as a phenomenon, as well as on ways and means to decrease the existing population of space debris.

201. The view was expressed that the Subcommittee should consider questions relating to the last phase of the de-orbiting of non-functional space objects, such as re-entry notifications, at both the national and the international level.

202. The view was expressed that further analysis of non-functional space objects and fragments or pieces of space debris, and of the possibility of making a distinction between them, should be conducted.

203. The view was expressed that sovereign rights over space objects, whether functional or non-functional, including the right to make decisions on removal, should be continuously retained by a launching State or a State of registration.

204. The view was expressed that quality and reliability assurance, including mission assurance, should be further emphasized, as well as avoidance of in-orbit collision during orbital operation and during the ascent phase of launch vehicles for manned space systems; increasing ground safety with regard to re-entering objects; sharing knowledge on debris removal; promoting networks for monitoring, modelling and forecasting the space environment; and the development of design technologies.

205. The view was expressed that in order to enhance the possibility of making decisions based on consensus, the Working Group and its expert groups should adhere to a predictable framework for decision-making and follow the terms of reference and methods of work, as agreed by the Committee on the Peaceful Uses of Outer Space.

206. The view was expressed that the views of civil society and other social groups should be taken into consideration in the work of the Working Group and its expert groups.

207. The view was expressed that the expert groups should take into consideration in their deliberations the work done under existing mandates and ongoing operations

of other subsidiary bodies of the Subcommittee, as well as in the context of other bodies.

208. At its 776th meeting, on 17 February, the Chair of the Working Group on the Long-term Sustainability of Outer Space reported on the work conducted by the Working Group during the present session.

209. The Subcommittee noted that expert groups B (space debris, space operations), C (space weather) and D (regulatory regimes) had agreed to meet on the margins of the fifty-fifth session of the Committee, to be held in Vienna in June 2012, and of the 63rd International Astronautical Congress, to be held in Naples, Italy, in October 2012. The Subcommittee noted that expert group A (sustainable space utilization) had agreed to meet on the margins of the fifty-fifth session of the Committee and that it would at that time make a decision on whether also to meet during the 63rd International Astronautical Congress.

210. At its 776th meeting, on 17 February, the Subcommittee endorsed the report of the Working Group on the Long-term Sustainability of Outer Space Activities, which is contained in annex IV to the present report.

## **XII. 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 developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union**

211. In accordance with General Assembly resolution 66/71, the Scientific and Technical Subcommittee considered agenda item 15, "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 developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union", as a single issue/item for discussion.

212. The representatives of the Russian Federation, Saudi Arabia and Venezuela (Bolivarian Republic of) made statements under agenda item 15. During the general exchange of views, statements relating to the item were also made by representatives of other member States, the representative of Ecuador on behalf of the Group of Latin American and Caribbean States and the representative of South Africa on behalf of the Group of African States.

213. The Subcommittee heard the following scientific and technical presentations:

(a) "Actual situation in the geostationary orbit", by the representative of the Czech Republic;

(b) "Fostering fast telecommunications development through the use of Q-V band satellite links", by the representative of Italy.



214. The Subcommittee welcomed the information provided in the annual report for 2011 of the Radiocommunication Bureau of ITU on the use of the geostationary satellite orbit and other orbits ([www.itu.int/itu-R/space/snl/report](http://www.itu.int/itu-R/space/snl/report)), as well as other documents referred to in conference room paper A/AC.105/C.1/2012/CRP.17. The Subcommittee invited ITU to continue submitting reports to it.

215. The Subcommittee noted the information on the situation in the geostationary orbit, submitted by the delegation of the Czech Republic and contained in conference room paper A/AC.105/C.1/2012/CRP.25.

216. Some delegations were of the view that the geostationary orbit was a limited natural resource that was at risk of becoming saturated, thereby threatening the sustainability of space activities in that environment; that its exploitation should be rationalized; and that it should be made available to all States, under equitable conditions, irrespective of their current technical capabilities, taking into account in particular the needs of developing countries and the geographical position of certain countries.

217. Some delegations were of the view that, as the geostationary orbit was a limited resource at risk of becoming saturated, its use should be streamlined, giving priority to activities with a long-term perspective, leading to the achievement of the Millennium Development Goals (A/56/326, annex), while taking into account the conditions of equality of all countries irrespective of their current space capacities.

218. Some delegations were of the view that the geostationary orbit provided unique potential for access to communications and information, in particular for assisting developing countries in implementing social programmes and educational projects, and for providing medical assistance. Those delegations were also of the view that it was important to use the geostationary orbit in compliance with international law, in accordance with the decisions of ITU and within the legal framework established in the relevant United Nations treaties.

219. Some delegations expressed the view that close communication should be maintained among the Scientific and Technical Subcommittee, the Legal Subcommittee and other relevant bodies of the United Nations system, with the aim of promoting the development of binding international rules that addressed the use of the geostationary orbit.

220. The Subcommittee took note of the proposal by the Russian Federation that the allocation of frequency resources in the geostationary orbit could be improved by applying a new method, which would allow a State that did not have registered applications for radio-broadcasting satellite systems in the range of 21.4-22 GHz to enjoy a special registration-guaranteed procedure with the Radiocommunications Bureau of ITU, and that, as a result of the application of that method, the share of compatible systems in the above-mentioned range would increase from 9.3 per cent to 76.7 per cent.

221. Some delegations were of the view that this item should remain on the agenda of the Subcommittee and that its study could be carried out, as necessary, by working groups or intergovernmental panels in order to ensure the use of the geostationary orbit in accordance with international law.

### **XIII. Draft provisional agenda for the fiftieth session of the Scientific and Technical Subcommittee**

222. In accordance with General Assembly resolution 66/71, the Subcommittee considered agenda item 16, "Draft provisional agenda for the fiftieth session of the Scientific and Technical Subcommittee".

223. The Subcommittee noted that the Secretariat had scheduled the fiftieth session of the Subcommittee to be held from 11 to 22 February 2013.

224. The Subcommittee noted that, in accordance with General Assembly resolution 66/71, it would submit to the Committee its proposal on the draft provisional agenda for the fiftieth session of the Subcommittee and recommended that the following substantive items be included in the draft provisional agenda:

1. General exchange of views and introduction of reports submitted on national activities.
2. United Nations Programme on Space Applications.
3. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III).
4. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
5. Space debris.
6. Space-system-based disaster management support.
7. Recent developments in global navigation satellite systems.
8. Space weather.
9. Items to be considered under workplans:
  - (a) Use of nuclear power sources in outer space;  
(Work for 2013 as reflected in the multi-year workplan in paragraphs 8 and 10 of annex II to the report of the Scientific and Technical Subcommittee on its forty-seventh session (A/AC.105/958))
  - (b) Near-Earth objects;  
(Work for 2013 as reflected in the multi-year workplan in paragraph 9 of annex III to the report of the Scientific and Technical Subcommittee on its forty-eighth session (A/AC.105/987))
  - (c) Long-term sustainability of outer space activities.  
(Work for 2013 as reflected in paragraph 23 of the terms of reference and methods of work of the Working Group on the Long-Term Sustainability of Outer Space Activities, contained in annex II to the report of the Committee on its fifty-fourth session (A/66/20))
10. Single issue/item for discussion: 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 developments in space communications, taking particular account of the needs and interests of developing countries, without prejudice to the role of the International Telecommunication Union.

11. Draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee, including identification of subjects to be dealt with as single issues/items for discussion or under multi-year workplans.

225. The Subcommittee noted that the topic for the symposium to be organized in 2013 by the International Astronautical Federation, in accordance with the agreement reached by the Subcommittee at its forty-fourth session, in 2007 (A/AC.105/890, annex I, para. 24), should be considered by the Committee at its fifty-fifth session under the agenda item on the report of the Scientific and Technical Subcommittee on its forty-ninth session.

226. The Subcommittee noted the conclusion of the item entitled “International Space Weather Initiative” and agreed that an item entitled “Space weather” should be introduced as a regular item on the agenda of the Subcommittee, in order to allow member States of the Committee and international organizations having permanent observer status with the Committee to exchange views on national, regional and international activities related to space weather research with a view to promoting greater international cooperation in that area. The Subcommittee noted that it could, through that item, serve as an important advocate for efforts to close existing gaps in the space weather research field.

227. The Subcommittee noted with appreciation that Romania, in its capacity as Chair of the Committee, had sent a letter to the Secretariat of the United Nations Conference on Sustainable Development (Rio+20) (A/AC.105/C.1/2012/CRP.10) officially submitting the contribution of the Committee to the Conference (A/AC.105/993) for consideration in the preparation of the zero draft of the outcome document of the Conference.

228. The Subcommittee noted the important contribution of space technology to sustainable development. In that regard, the Subcommittee invited Member States of the United Nations to contribute to the drafting process of the outcome document of the Conference with reference to the fundamental role of space-technology-based data and geospatial information for the management of sustainable development in the twenty-first century.

229. In that context, the Subcommittee agreed that the following sentence should be inserted in the subsection on science and technology of chapter V, section C, of the zero draft, as paragraph 118 bis:

We recognize the fundamental significance of space-technology-based data and geospatial information for global, regional and national policymaking, programming and project operations related to the sustainable development and use of our natural and environmental resources endowment, and we shall support more effective efforts to promote the development of all countries and regions of the world.

230. The Subcommittee requested the Secretariat to communicate paragraphs 227 to 229 above in a note verbale to the Permanent Missions of States Members of the United Nations in Vienna, in view of the urgency of the matter.

## Annex I

### **Report of the Working Group of the Whole**

1. In accordance with paragraph 7 of General Assembly resolution 66/71, the Scientific and Technical Subcommittee, at its forty-ninth session, reconvened its Working Group of the Whole. The Working Group held four meetings from 7 to 16 February 2012, under the chairmanship of S. K. Shivakumar (India). The Working Group considered the United Nations Programme on Space Applications, the implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), space-system-based disaster management support, the draft provisional agenda for the fiftieth session of the Subcommittee, to be held in 2013, and organizational matters. At its fourth meeting, on 16 February, the Working Group adopted the present report.

### **United Nations Programme on Space Applications**

2. For its consideration of the United Nations Programme on Space Applications, the Working Group had before it the report of the Expert on Space Applications, (A/AC.105/1011). The Working Group noted the meetings, seminars, symposiums, training courses and workshops that had been proposed in the report of the Expert on Space Applications.

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

3. For its consideration of the implementation of the recommendations of UNISPACE III, the Working Group had before it the documents referred to under item 6 of the agenda of the Subcommittee (see para. 56 in the main body of the report above).

4. The Working Group noted that the General Assembly, in its resolution 66/71, had noted with satisfaction that a number of the recommendations of UNISPACE III had been implemented and that satisfactory progress was being made in implementing the outstanding recommendations through national and regional activities. The Working Group also noted its multi-year review of the status of the implementation of the recommendations of UNISPACE III (A/AC.105/C.1/2010/CRP.5). In that regard, the Working Group agreed that it should not continue reviewing the implementation of the recommendations of UNISPACE III.

5. The Working Group agreed that at the next session of the Subcommittee, the Working Group should study the outcome of the United Nations Conference on Sustainable Development (Rio+20), to be held in Rio de Janeiro, Brazil, in June 2012, with a view to discussing ways and means of assisting the Subcommittee and the Committee in future activities that could be considered appropriate in relation to results of the Rio+20 Conference.

6. The Working Group recalled that the Declaration on the Fiftieth Anniversary of Human Space Flight and the Fiftieth Anniversary of the Committee on the Peaceful Uses of Outer Space, adopted by the General Assembly in its resolution 66/71, stressed the need to look more closely into how advanced space research, exploration systems and technologies could further contribute to meeting challenges, including that of global climate change, and to food security and global health.

7. The Working Group noted with appreciation, in that context, the participation of the World Health Organization in the current session of the Subcommittee. The Working Group noted with satisfaction that the Action Team on Public Health had held a meeting during the session. The Working Group also noted with satisfaction that the delegation of Canada had presented to the Working Group a summary report on the workshop on the topic “Space technology for public health action in the context of climate change adaptations”, held in June 2011 in Montreal, Canada. In this context, the Working Group noted that continued discussions were needed at the national, regional and international levels on the use of space technology to bring concrete benefits for meeting health needs, in particular in the fields of tele-epidemiology and tele-health.

### **Space-system-based disaster management support**

8. For its consideration of space-system-based disaster management support, the Working Group of the Whole had before it the documents referred to under item 9 of the Subcommittee (see para. 99 in the main body of the report above). The Working Group noted with satisfaction that the Programme Coordinator for the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) had made a statement in the Working Group on the activities carried out in 2011 and on the proposed revised UN-SPIDER workplan for the biennium 2012-2013. The Working Group noted the proposed revised workplan for the biennium 2012-2013 for the UN-SPIDER programme.

### **Draft provisional agenda for the fiftieth session of the Scientific and Technical Subcommittee**

9. The Working Group noted that, in accordance with General Assembly resolution 66/71, the Scientific and Technical Subcommittee would submit to the Committee its proposal for the draft provisional agenda for the fiftieth session of the Subcommittee, to be held in 2013. The Working Group recommended that the draft provisional agenda for the fiftieth session be considered directly in the Subcommittee under its agenda item 16.

10. The Working Group took note of several improvements related to organizational matters and method of work of the Subcommittee on the basis of decisions made by the Committee on the Peaceful Uses of Outer Space at its fifty-fourth session, in 2011, as reflected in the annotated provisional agenda for the current session of the Subcommittee (A/AC.105/C.1/L.310), and agreed that further consideration could be given to organizational matters in the Working Group during the fiftieth session of the Subcommittee, in 2013.

## Annex II

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

1. At its 758th meeting, on 6 February 2012, the Scientific and Technical Subcommittee reconvened 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 recalled the objectives of its multi-year workplan for the period 2011-2015, adopted by the Subcommittee at its forty-seventh session (A/AC.105/958, annex II, para. 7):

(a) To promote and facilitate the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space by providing information pertinent to challenges faced by member States and international intergovernmental organizations, in particular those considering or initiating involvement in applications of nuclear power sources (NPS) in outer space;

(b) To identify any technical topics for, and establish the objectives, scope and attributes of, any potential additional work by the Working Group to further enhance safety in the development and use of space NPS applications. Any such additional work would require the approval of the Subcommittee and would be developed with due consideration for relevant principles and treaties.

3. The Working Group held a workshop during its first meeting, on 8 February 2012, in accordance with its multi-year workplan. Five presentations were delivered at the workshop. (For summaries of the presentations, see the appendix to the present report.)

4. The presentations were followed by an open discussion on various topics, including the launch authorization process; the range of entities involved in the emergency response process; the relationship between emergency response for non-NPS launches and that for launches involving NPS applications; and the current status of, and any potential hazards associated with, past, present and future NPS applications. The implementation status of the Safety Framework and its relationship to relevant international treaties and conventions were also discussed, as well as the responsibilities and liabilities of organizations involved in space NPS missions.

5. The Working Group noted that the presentations had contributed significantly to fulfilling the objectives of its multi-year workplan contained in paragraph 2 (a) above. It also noted that there would be a further opportunity for member States and international intergovernmental organizations to make presentations at the next workshop.

6. Some delegations expressed the view that additional research could be needed in relation to the potential impact of certain possible future NPS applications on the environments surrounding the Earth, other planets and other celestial bodies.

7. The Working Group noted the comments that had been made in the presentations and general discussions about possible areas for further enhancing

safety in the development and use of space NPS applications. Those were potentially relevant to the objectives of the workplan contained in paragraph 2 (b) above and would be considered at the workshop in 2013 and carried forward into the discussion about potential additional work that would take place at the end of the series of workshops.

8. The Working Group noted with appreciation the following presentations:

(a) “The safety framework for nuclear power sources in outer space: current and planned applications, and challenges”, by the representative of France, which addressed the topic of international responsibility and liability in the specific case of the International Thermonuclear Experimental Reactor (ITER) International Fusion Energy Organization (also presented in A/AC.105/C.1/L.318);

(b) “European Space Nuclear Power Programme: United Kingdom activities”, by the representative of the United Kingdom, which outlined the ongoing work in the United Kingdom, within the European Space Nuclear Power Programme, on the development of potential radioisotope power sources for space missions.

9. The Working Group recognized that the information contained in those presentations was relevant to its ongoing discussions.

10. The Working Group recalled that, in accordance with its multi-year workplan, it would hold in 2013 a workshop with member States and international intergovernmental organizations and that the workshop would be organized with the same arrangements as set out in the report on its meeting held during the forty-seventh session of the Subcommittee, in 2010 (A/AC.105/958, annex II, para. 10).

11. The Working Group stressed that, at the workshop to be held in 2013, it would be beneficial to have the broadest possible contribution from member States and international intergovernmental organizations with experience in space NPS applications. Also, the Working Group encouraged all member States and international intergovernmental organizations considering or initiating involvement in space NPS applications to contribute actively to that workshop.

12. The Working Group requested the Secretariat to invite, in March 2012, member States and international intergovernmental organizations with experience in space NPS applications, as well as those considering or initiating involvement in space NPS applications, to notify the Secretariat of any plans they might have to provide workshop presentations in 2013, in accordance with the workplan of the Working Group.

13. The Working Group agreed to hold a teleconference in June or July 2012 in order to review the replies received to the invitation referred to in paragraph 12 above and to plan its activities for the rest of 2012.

14. The Working Group agreed that, should no presentations be offered from member States and international intergovernmental organizations for the workshop in 2013, it would conduct its work during the fiftieth session of the Subcommittee, in 2013, under the arrangements established in its workplan for 2014, as adopted by the Subcommittee at its forty-seventh session (A/AC.105/958, annex II, para. 8).

15. At its third meeting, on 16 February 2012, the Working Group adopted the present report.

## Appendix

### **Summaries of the presentations made at the workshop held during the meeting of the Working Group on the Use of Nuclear Power Sources in Outer Space**

#### **“Discussion on the safety of space nuclear power sources”, by Zhu Anwen (China) (A/AC.105/C.1/2012/CRP.5)**

As regards the safety of nuclear power sources (NPS) in outer space, China takes a similar view to that contained in the Safety Framework for Nuclear Power Source Applications in Outer Space.

When it comes to space NPS, special attention should be paid to technology relating to safety and radiation protection. The safety of space NPS should be taken into account in their design. Safeguards should be put in place and tested in the development process. Relatively accurate risk assessments of space NPS can be made on the basis of the technology used for conducting risk assessments of civilian nuclear facilities in China. All possible measures should be adopted in accordance with accident plans in order to minimize the consequences of a potential accident.

Space NPS are an essential technological development that facilitate the exploration of space and the universe. Nevertheless, they also pose a threat to the environment of the Earth's biosphere. As space nuclear power sources are developed, China is committed to supporting the efforts of the Office for Outer Space Affairs of the Secretariat and the International Atomic Energy Agency relating to the safety of space NPS, and is convinced that the safety of such sources is a key issue in the development of space nuclear power technologies.

China appeals to countries around the world to strengthen research and cooperation in developing technologies that ensure the safety of space NPS in order to increase the safety and use of such technologies, remove any uncertainty about their safety and ensure adequate protection for people and the environment, while also ensuring that the benefits of those new advanced technologies are widely enjoyed.

#### **“Joint statement made by representatives of the Russian Federal Space Agency and the State Atomic Energy Corporation ‘Rosatom’”, by Alexander Solodukhin (Russian Federation) (A/AC.105/C.1/2012/CRP.6)**

The Russian Federation has established a system for the safe use of space vehicles with NPS that meets international requirements.

In accordance with United Nations recommendations, a body of State and space-sector regulations to ensure the safe use of transport power modules with megawatt-class nuclear power propulsion systems is being drawn up.

The project to create a transport power module with such a system is being implemented in accordance with all technical safety measures recommended by the United Nations and prescribed by the relevant regulations of the Russian Federation.



While the transport power module is being developed, possible new issues relating to the safe use of NPS in space are being examined and identified for further investigation.

**“United States preparedness and response activities for space exploration missions involving nuclear power sources”, by Reed Wilcox (United States of America) (A/AC.105/C.1/L.314 and A/AC.105/C.2/2011/CRP.4)**

The United States of America conducts extensive preparedness and response activities for all missions involving the application of NPS. Consistent with the Safety Framework for Nuclear Power Source Applications in Outer Space, jointly published by the Scientific and Technical Subcommittee and the International Atomic Energy Agency in 2009, these activities encompass planning, training, rehearsals, procedure development (including communication protocols) and the drafting of potential accident notifications. Because accidents could occur at the launch site, downrange or out of orbit, the plans involve multiple government agencies at the federal, state and local levels and a broad range of resources that are either pre-deployed or readily accessible in the event of an accident. The plans support a rapid response to an accident potentially involving the release of radioactive material. They also facilitate the establishment of systems required for quickly identifying those accidents which do not involve a release of radioactive material — an important capability for avoiding the extended imposition of protective action measures.

**“The United States approach to nuclear launch accident mitigation”, by Ryan Bechtel (United States of America) (A/AC.105/C.1/L.315 and A/AC.105/C.1/2012/CRP.3)**

The United States of America subjects its planned launches of nuclear power source applications to an extensive radiological contingency planning process to characterize and mitigate any possible effects of a nuclear launch accident. This process is consistent with the relevant guidance recommended in the Safety Framework. For every launch involving nuclear material, the United States creates contingency plans to mitigate accident sequences that could lead to a radiological hazard. A network of remote sensors and monitoring teams are established around the launch area to determine whether a release from an accident has occurred and, if necessary, to characterize the nature of any release. Information from the sensors is collected and interpreted in the Radiological Control Center, which is staffed by national experts in radiological emergencies. These experts may recommend actions to limit the exposure of population groups in potentially affected areas. A joint information centre is established to promptly distribute consistent, accurate and current information to the appropriate Governments, international organizations and non-governmental entities, as well as the general public. Numerous exercises are conducted before every launch to practise this response and ensure that the United States is ready to react appropriately and promptly in the unlikely event of a launch accident involving nuclear material.

**“Implementing the International Safety Framework for Space Nuclear Power Sources at the European Space Agency: options and open questions”, by Leopold Summerer (European Space Agency) (A/AC.105/C.1/2012/CRP.24)**

The European Space Agency (ESA) subjects all its space missions to a rigorous, well-established safety programme that has an excellent track record. The energy provided by nuclear power sources has enabled past interplanetary science missions of ESA and might be needed to enable future science and exploration missions.

ESA has started the process of implementing the guidance provided by the Safety Framework. While preliminary analysis indicates that the implementation of much of the guidance appears to be straightforward, the implementation of some of the guidance requires a deeper analysis of the options available within the organizational setup of ESA. These include questions related to:

- (a) The implementation of the prime responsibility of the organization conducting the space NPS mission, not to be confused with the responsibilities of States, and its formal arrangements with all relevant participants of the mission;
- (b) The division of responsibilities between ESA and its member States related to the guidance for Governments and relevant international intergovernmental organizations authorizing, approving or conducting space NPS missions;
- (c) The organization of launch safety and emergency preparedness and response for different launch phases and accident scenarios.

## Annex III

### Report of the Working Group on Near-Earth Objects

1. Pursuant to paragraph 7 of General Assembly resolution 66/71, the Scientific and Technical Subcommittee, at its forty-ninth session, reconvened its Working Group on Near-Earth Objects under the Chairmanship of Sergio Camacho (Mexico). The Working Group held 4 meetings, from 13 to 16 February 2012.
2. In accordance with the multi-year workplan under the item on near-Earth objects (NEOs) (A/AC.105/987, annex III), the Working Group reviewed the following items:
  - (a) Consideration of the reports submitted in response to the annual request for information on NEO activities and continuation of intersessional work;
  - (b) Review of progress on international cooperation and collaboration on NEO observations;
  - (c) Facilitation, for the purpose of NEO threat detection, of a more robust international capability for the exchange, processing, archiving and dissemination of data;
  - (d) Continuation of the work begun during the intersessional period on drafting international procedures for handling the NEO threat and the seeking of agreement on those procedures;
  - (e) Consideration of updated information as presented in an interim report of the Action Team on Near-Earth Objects;
  - (f) Review of progress made in activating the work of the NEO Information, Analysis and Warning Network (IAWN) and the mission planning and operations group.
3. The Working Group noted that during the current session of the Subcommittee, technical presentations were made related to close-approaching asteroids in 2011, to the close approach of Apophis in 2029 and risk communications with the media related to NEOs.
4. The Working Group had before it information on research in the field of near-Earth objects carried out by Member States, international organizations and other entities (A/AC.105/C.1/100 and A/AC.105/C.1/2012/CRP.9).
5. The Working Group noted that in 2011, the intersessional work of the Action Team on Near-Earth Objects had been carried out on the margins of the fifty-fourth session of the Committee on the Peaceful Uses of Outer Space, in two workshops and through electronic correspondence.
6. The Working Group noted that the Action Team on Near-Earth Objects had held five meetings on the margins of the forty-ninth session of the Scientific and Technical Subcommittee. The Action Team, *inter alia*, exchanged information on the close approach to Earth of the asteroid Apophis in 2029, as well as on the current knowledge about an asteroid known as 2011 AG5.

7. The Working Group noted that the Action Team had proposed that a task force be formed to further analyse the asteroid 2011 AG5 and inform the Action Team on its progress by the fifty-fifth session of the Committee.
8. The Action Team, with the support of the National Aeronautics and Space Administration (NASA) Near-Earth Object Program Office, had organized the Workshop on International Recommendations for NEO Threat Mitigation, held in Pasadena, California, United States, on 25 and 26 August 2011. The Workshop, co-organized and co-sponsored by ASE and SWF, addressed key issues related to the required actions and cooperation needed by a mission planning and operations group in preparing for a possible NEO impact threat to Earth. The Workshop had prepared a first draft of the terms of reference for a mission planning and operations group.
9. The Working Group noted that on the recommendation of the Action Team, the NEO Observations Program Executive of NASA and the Space Situational Awareness-NEO Segment Manager of ESA had invited representatives of space agencies to discuss, in particular, the first draft terms of reference for a mission planning and operations group, on the margins of the forty-ninth session of the Scientific and Technical Subcommittee, in preparation for planning an overall NEO threat mitigation system.
10. The Working Group noted that the NEO Media/Risk Communications Workshop had been organized by SWF under the auspices of the Action Team and held in Boulder, Colorado, United States, on 14 and 15 November 2011. During the Workshop, discussions were held on how best to inform the public of the threat of an NEO impact in a way that would avoid misinformation and on how to provide guidance on the development of an outreach and education plan that fostered accurate and timely information about the possible effects of a potentially hazardous NEO. The recommendations resulting from that Workshop would be incorporated in the final report of the Action Team to the Subcommittee in 2013.
11. The Working Group noted with satisfaction that in the intersessional period, the Action Team on Near-Earth Objects had updated its interim report (A/AC.105/C.1/L.316), which was before the Subcommittee at its current session.
12. The Working Group agreed that the Action Team on Near-Earth Objects should be tasked with continuing its work on the draft recommendations for an international response to the near-Earth object impact threat with a view to finalizing them by the fiftieth session of the Subcommittee, to be held in 2013. The Working Group further agreed that intersessional work to be carried out in the period 2012-2013 could include workshops held under the auspices of the Action Team that would bring together experts on various aspects of the draft recommendations made by the Action Team (see A/AC.105/C.1/L.317).
13. The Working Group encouraged member States to participate in the intersessional work on NEOs and submit their research contributions to the Chair of the Action Team. The Working Group also encouraged member States to provide financial support for the facilities and programmes necessary for NEO threat detection and mitigation.
14. The Working Group encouraged member States and their institutions to follow NEO developments on a regular basis, information on which was

available on websites such as those of NASA (<http://neo.jpl.nasa.gov> and [www.jpl.nasa.gov/asteroidwatch](http://www.jpl.nasa.gov/asteroidwatch)) and IAU ([www.iau.org/public/nea](http://www.iau.org/public/nea)).

15. At its 4th meeting, on 16 February 2012, the Working Group adopted the present report.

## Annex IV

### **Report of the Working Group on the Long-term Sustainability of Outer Space Activities**

1. In accordance with paragraph 7 of General Assembly resolution 66/71, the Scientific and Technical Subcommittee, at its forty-ninth session, reconvened its Working Group on the Long-Term Sustainability of Outer Space Activities.
2. The Working Group held 3 meetings, from 9 to 17 February 2012, under the chairmanship of Peter Martinez (South Africa).
3. At the first meeting, the Chair of the Working Group presented a report on the work conducted following the adoption of the terms of reference and methods of work of the Working Group<sup>a</sup> by the Committee on the Peaceful Uses of Outer Space at its fifty-fourth session, held in June 2011.
4. In accordance with its terms of reference and methods of work, the Working Group had before it the following documents:
  - (a) Note by the Secretariat on experiences and practices related to the long-term sustainability of outer space activities (A/AC.105/C.1/103 and Add.1);
  - (b) Conference room paper containing a list of points of contact for the Working Group, and members of expert groups A through D (A/AC.105/C.1/2012/CRP.12);
  - (c) Conference room papers containing full reports on experiences and practices related to the long-term sustainability of outer space activities received from member States and permanent observers of the Committee, as well as other international organizations and bodies (A/AC.105/C.1/2012/CRP.13, A/AC.105/C.1/2012/CRP.14 and A/AC.105/C.1/2012/CRP.15);
  - (d) Conference room paper containing the report of the International Interdisciplinary Congress on Space Debris entitled “Active debris removal — an essential mechanism for ensuring the safety and sustainability of outer space” (A/AC.105/C.1/2012/CRP.16);
  - (e) Conference room paper containing a report received from Ecuador (A/AC.105/C.1/2012/CRP.18);
  - (f) Working paper submitted by the Russian Federation and Ukraine (A/AC.105/C.1/2012/CRP.21).
5. The Working Group recalled that four expert groups had been established in accordance with the terms of reference to address the following topics:
  - (a) Sustainable space utilization supporting sustainable development on Earth, chaired by Filipe Duarte Santos (Portugal);

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<sup>a</sup> *Official Records of the General Assembly, Sixty-sixth Session, Supplement No. 20 (A/66/20), annex II.*

(b) Space debris, space operations and tools to support collaborative space situational awareness, co-chaired by Claudio Portelli (Italy) and Richard Buenneke (United States);

(c) Space weather, chaired by Takahiro Obara (Japan);

(d) Regulatory regimes and guidance for actors in the space arena, co-chaired by Sergio Marchisio (Italy) and Anthony Wicht (Australia).

6. The Working Group welcomed the establishment by the Secretariat of a dedicated web page with restricted access ([www.unoosa.org/oosa/en/COPUOS/stsc/lts/index.html](http://www.unoosa.org/oosa/en/COPUOS/stsc/lts/index.html)) to facilitate the sharing of information on the work being conducted by the Working Group and its four expert groups. The Working Group further noted that the access details for that web page had been communicated to all permanent missions to the United Nations (Vienna) of States members of the Committee.

7. The Working Group noted that expert groups B (space debris, space operations), C (space weather) and D (regulatory regimes) had held informal coordination meetings on the margins of the 62nd International Astronautical Congress, in Cape Town, South Africa, in October 2011. The reports of those informal coordination meetings had been made available on the web page referred to above.

8. The Working Group noted with appreciation the workshop that had been held during its first meeting, on 9 February 2012, in accordance with its multi-year workplan. During the workshop the Working Group considered the intersessional activities of the expert groups, as well as their plans for advancing the work under their respective mandates. A brief summary of the presentations delivered by the chairs and co-chairs of the expert groups during the workshop is contained in the appendix to the present report. The full presentations were placed on the web page of the forty-ninth session of the Scientific and Technical Subcommittee, as well as on the web page dedicated to the Working Group.

9. The Working Group noted that during the workshop the expert group chairs and co-chairs, in presenting their workplans for 2012, had proposed to meet on the margins of and/or during the fifty-fifth session of the Committee, to be held in Vienna in June 2012, and the 63rd International Astronautical Congress, to be held in Naples, Italy, in October 2012.

10. The Working Group noted that all four expert groups had met on the margins of the current session of the Scientific and Technical Subcommittee and that the reports on the work they conducted following the workshop would be made available on the web page referred to above.

11. The Working Group noted that it was important that the expert groups perform a gap analysis to identify issues affecting the long-term sustainability of outer space activities that were not being addressed in any forum at present.

12. The view was expressed that satellite operators would welcome information on space weather hazards and conjunction risks on a daily basis and that expert groups B and C should consider means by which satellite operators could access space weather information and exchange orbital parameters to allow the most accurate risk analysis possible to be performed.

13. The Working Group noted that several countries had operational space situational awareness programmes and that improved coordination among those programmes could enhance the collective space situational awareness of the global space community.
14. The view was expressed that the Office for Outer Space Affairs should take part in the discussions of expert groups B and C relating to data centres, with a view to possibly linking the Register of Objects Launched into Outer Space maintained by the Office and other data centres.
15. Some delegations were of the view that the expert groups should hold consultations in different regions, including engaging with regional forums.
16. At its second meeting the Working Group agreed on the following:

*Meetings and decisions of the expert groups*

- (a) That the expert groups would, in accordance with the terms of reference and methods of work of the Working Group, meet on the margins of and/or during the sessions of the Scientific and Technical Subcommittee and the Committee, and at other times to be agreed in advance by the expert groups, preferably at the session of the Scientific and Technical Subcommittee;
- (b) That expert groups could decide to hold some of their meetings jointly to address mutually relevant matters;
- (c) That decisions of the expert groups would be taken only at the working meetings held on the margins of and/or during the sessions of the Scientific and Technical Subcommittee and the Committee;
- (d) That the expert groups could decide to hold additional coordination meetings and/or informal events to advance their work intersessionally, but that no decisions would be taken at such meetings and/or events;

*Reports of the expert groups*

- (e) That the expert group chairs and co-chairs would report to the Working Group at its meetings during the sessions of the Scientific and Technical Subcommittee on the intersessional activities and progress of their respective expert groups;

*Information flow from expert groups to the Working Group*

- (f) That the expert groups would, in accordance with the terms of reference and methods of work of the Working Group, agree on the appropriate status, reliability and relevance of the information to be provided to support the deliberations of the Working Group;
- (g) That the expert groups would make available submissions received, in their original form, on the dedicated web page referred to in paragraph 6 above;
- (h) That the expert groups would prepare their draft inputs to the Working Group on the basis of their work;
- (i) That those draft working documents should be made available for comments by member States and permanent observers of the Committee, preferably



on the margins of and/or during the sessions of the Committee in June 2012 and 2013;

(j) That the comments from member States would be transmitted to the appropriate expert groups for their consideration;

*Incorporation of expert group inputs to the Working Group*

(k) That the inputs from the expert groups would be received by the Working Group, in all official languages of the United Nations, at its meetings during the sessions of the Scientific and Technical Subcommittee.

17. The Working Group noted that the working documents referred to in paragraph 16 (i) above should be made available in all official languages of the United Nations, on the understanding that those documents would be submitted to the Secretariat no later than four weeks in advance of the sessions of the Committee.

18. The Working Group noted that the Chair of the Working Group and the chairs and co-chairs of the expert groups would hold coordination meetings on the margins of the fifty-fifth session of the Committee, in June 2012. The purpose of those meetings would be to coordinate the work of the expert groups, with emphasis on addressing gaps, identifying cross-cutting issues and avoiding duplication of efforts. The Working Group noted that some of the expert groups could decide to hold joint meetings to address certain cross-cutting issues identified in those coordination meetings.

19. At its 3rd meeting, on 17 February 2012, the Working Group adopted the present report.

## **Appendix**

### **Summaries of the presentations delivered at the workshop held during the meeting of the Working Group on the Long-Term Sustainability of Outer Space Activities on 9 February 2012**

#### **Presentation of expert group A: sustainable space utilization supporting sustainable development on Earth**

In the presentation an attempt was made to organize the issues of sustainable development through the identification of four strongly interconnected clusters of drivers of unsustainability, namely: (a) inequalities of development, poverty, hunger and deficiencies in health and well-being; (b) unsustainability of energy systems; (c) climate change; and (d) food insecurity, biodiversity loss, water scarcity and scarcity of other natural resources. Questions related to equitable access to the limited resources of outer space were also identified. The final part of the presentation was devoted to the process methodology and scheduling for the development of the report of expert group A.

**Presentation of expert group B: space debris, space operations and tools to support collaborative space situational awareness**

The presentation began with a consideration of the various aspects of space debris, space operations and space situational awareness listed in the terms of reference of the Working Group on the Long-Term Sustainability of Outer Space Activities that could fall within the scope of the deliberations of expert group B. The flow of information, projected activities and timelines envisaged for the expert group were then presented. This was followed by a summary of submissions received to date from member States, intergovernmental entities with permanent observer status with the Committee and other invited entities in relation to space debris, space operations and space situational awareness.

**Presentation of expert group C: space weather**

The presentation identified 16 risk areas in the context of space weather. As the risks were time-dependent, continuous monitoring of observable parameters linked to those risks was essential, and current monitoring capabilities in each of the 16 areas were identified. When combined with various models, observations of the risk parameters allowed the forecasting of future space weather conditions. Eleven forecasting tools in common use were identified; forecasts relied on cooperative sharing of space weather data from a wide variety of sensors on Earth and in space. The International Space Environment Service, involving 13 countries, was mentioned as an example of a cooperative service. The presentation concluded with the proposed methodology and general plan of work for expert group C.

**Presentation of expert group D: regulatory regimes and guidance for actors in the space arena**

The presentation began with a discussion of the terms of reference of expert group D in order to define the boundaries of its discussions and to draw attention to other work currently being undertaken in the regulatory area so as to avoid duplication. The presentation included the expert group's plan of work for its meetings on the margins of the 2012 session of the Scientific and Technical Subcommittee and a draft schedule of work for the period 2012-2014.

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