



# General Assembly

Distr.: General  
7 March 2013

Original: English

## Committee on the Peaceful

## Uses of Outer Space

### Fifty-sixth session

Vienna, 12-21 June 2013

## Report of the Scientific and Technical Subcommittee on its fiftieth session, held in Vienna from 11 to 22 February 2013

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## I. Introduction

1. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fiftieth session at the United Nations Office at Vienna from 11 to 22 February 2013, under the chairmanship of Félix Clementino Menicocci (Argentina).
2. The Subcommittee held 19 meetings.

### A. Attendance

3. Representatives of the following 58 member States of the Committee attended the session: Algeria, Argentina, Armenia, Australia, Austria, Belgium, Bolivia (Plurinational State of), Brazil, Burkina Faso, Canada, Chile, China, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kazakhstan, Kenya, Lebanon, Libya, Malaysia, Mexico, Mongolia, Morocco, Netherlands, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Slovakia, South Africa, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Venezuela (Bolivarian Republic of) and Viet Nam.
4. At its 777th meeting, on 11 February, the Subcommittee decided to invite, at their request, observers for the Dominican Republic, El Salvador, Ghana, Guatemala, Israel 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.
5. At the same meeting, the Subcommittee decided to invite, at its request, the observer for the Sovereign Military Order of Malta 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. Also at that 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.
7. Observers for the Economic and Social Commission for Western Asia, the United Nations Institute for Disarmament Research (UNIDIR), the International Telecommunication Union (ITU) and the World Meteorological Organization (WMO) attended the session. The session was also attended by the observer for the International Organization for Standardization (ISO).
8. 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).

9. 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 Society for Photogrammetry and Remote Sensing (ISPRS), International Space University (ISU), National Space Society (NSS), Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), Secure World Foundation (SWF), Space Generation Advisory Council (SGAC) and World Space Week Association (WSWA).

10. The Subcommittee took note of the application of Ghana for membership in the Committee (A/AC.105/C.1/2013/CRP.3).

11. The Subcommittee also took note of the application by the Inter-Islamic Network on Space Sciences and Technology for permanent observer status with the Committee (A/AC.105/C.1/2013/CRP.21).

12. A list of the representatives of States, United Nations entities and other international organizations attending the session is contained in A/AC.105/C.1/2013/INF/42.

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

13. At its 777th meeting, on 11 February, the Subcommittee adopted the following agenda:

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

11. Use of nuclear power sources in outer space.
12. Near-Earth objects.
13. Long-term sustainability of outer space activities.
14. 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.
15. Draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee.
16. Report to the Committee on the Peaceful Uses of Outer Space.

### C. General statements

14. Statements were made by representatives of the following member States during the general exchange of views: Algeria, Argentina, Austria, Brazil, Canada, Chile, China, Cuba, Czech Republic, Ecuador, France, Germany, Hungary, India, Indonesia, Iran (Islamic Republic of), Italy, Japan, Libya, Malaysia, Nigeria, Pakistan, Philippines, Poland, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Switzerland, Ukraine, United States, Venezuela (Bolivarian Republic of) and Viet Nam. A statement was also made by the observer for Guatemala on behalf of the Group of Latin American and Caribbean States. The observers for the Economic and Social Commission for Western Asia and WMO made general statements. General statements were also made by the observers for APSCO, ESA, ESPI, EURISY, IAF, IAU, NSS, SGAC and SWF.

15. The Subcommittee welcomed Armenia, Costa Rica and Jordan as new members of the Committee on the Peaceful Uses of Outer Space. The Ibero-American Institute of Aeronautic and Space Law and Commercial Aviation and SCOSTEP were welcomed as the newest permanent observers of the Committee.

16. At the 777th meeting, the Chair made a statement outlining the work of the Subcommittee at its current session. The Chair emphasized the need to study carefully the outcome of the United Nations Conference on Sustainable Development, held in Rio de Janeiro, Brazil, from 20 to 22 June 2012, and the emerging post-2015 development agenda in order for the Subcommittee to assist the Committee in its consideration of those global processes.

17. Also at the 777th meeting, the Director of the Office for Outer Space Affairs of the Secretariat made a statement reviewing the work programme of the Office and the need for additional resources to be able to successfully perform the envisaged responsibilities for the biennium 2014-2015.

18. The Subcommittee expressed its gratitude to Mazlan Othman, Director of the Office for Outer Space Affairs, on the occasion of her retirement, for her dedication

to the work of the Office and to the Committee, noting her contribution to the advancement of space science and technology.

19. 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 strict use for the improvement of living conditions and peace on the planet; and regional cooperation to promote the development of space activities.

20. 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 use of nuclear power sources in outer space, which were critical issues in the use and exploration of outer space.

21. Some delegations expressed the view that developing countries should benefit from space technologies, in particular to support their social and economic development, that it was necessary to promote cooperation to facilitate data exchange and the transfer of technology among States and that training of scientists in developing countries was crucial for the free flow of scientific information and data exchange, increased capacity-building and knowledge-sharing.

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

(a) “Asia-Pacific Regional Space Agency Forum: 20 years of history and a regional cooperation framework — towards a new era”, by the representative of Japan;

(b) “Mars Science Laboratory Mission and Curiosity”, by the representative of the United States;

(c) “Naro (KSLV-1): the first Korean space launch vehicle”, by the representative of the Republic of Korea;

(d) “Canada’s 50 years in space: Canadian space milestones”, by the representative of Canada;

(e) “Mexico’s participation in the Japanese Experiment Module-Extreme Universe Space Observatory (JEM-EUSO) mission”, by the representative of Mexico;

(f) “The Laser Relativity Satellite (LARES) mission: an example of a low-cost, high-science mission”, by the representative of Italy;

(g) “Aerospace Science and Technology Department: contributions towards the Brazilian space programme”, by the representative of Brazil;

(h) “The Polish contribution to the Copernicus programme”, by the representative of Poland;

(i) “The Pioneer mission of the Kavoshgar”, by the representative of the Islamic Republic of Iran;

(j) “Activities of the Ecuadorian Space Institute”, by the representative of Ecuador;

(k) “BRITE constellation: launch of the first Austrian nanosatellites”, by the representative of Austria;

(l) “Israel Space Agency: vision, objectives and activities”, by the observer for Israel;

(m) “Fifth PSIPW award winners and latest activities”, by the observer for PSIPW;

(n) “Space Generation Congress 2012: perspectives from university students and young professionals in the space sector”, by the observer for SGAC.

23. The Subcommittee noted with appreciation the lunchtime presentation entitled “Curiosity on Mars”, by the representative of the United States.

24. The Subcommittee expressed its gratitude to the delegation of Japan for organizing a scientific and technical event entitled “Space and development: Japanese development assistance using satellite data for sustainable development” on the margins of the current session of the Subcommittee.

#### **D. National reports**

25. The Subcommittee took note with appreciation of the reports submitted by Member States (see A/AC.105/1025 and Add.1, A/AC.105/C.1/2013/CRP.7, A/AC.105/C.1/2013/CRP.8, A/AC.105/C.1/2013/CRP.9 and A/AC.105/C.1/2013/CRP.22) for its consideration under agenda item 3, “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.

#### **E. Symposium**

26. On 11 February, IAF organized a symposium on the theme “Overview of studies and concepts for active orbital debris removal”, which was moderated by Gerard Brachet of IAF, with a welcome statement made by Kiyoshi Higuchi, President of IAF. The presentations given at the symposium included the following: “United States active debris removal efforts”, by Daren McKnight of Integrity Applications Incorporated; “Active debris removal activities in Centre national d’études spatiales (CNES)”, by Christophe Bonnal of CNES; “Space debris-related activities: the Japanese case”, by Tetsuo Yasaka of Kyushu University; “International Science and Technology Centre (ISTC) activities on the space debris problem”, by Tatiana Ryshova of ISTC; “The German Orbital Servicing Mission (DEOS)”, by Alin Albu-Schaeffer of the German Aerospace Center; “Status of active debris removal developments at the Swiss Space Center”, by Thomas Shildknecht of the University of Bern, on behalf of the Swiss Space Center; “The ESA Clean Space initiative”, by Leopold Summerer of ESA; and “The non-technical challenges of active debris removal”, by Brian Weeden of SWF.

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

27. After considering the items before it, the Subcommittee, at its 795th meeting, on 22 February 2013, 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**

28. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 4, "United Nations Programme on Space Applications".

29. At the 789th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

30. The representatives of Brazil, Canada, China, Germany, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Nigeria, Pakistan, the Republic of Korea and the Russian Federation made statements under agenda item 4. A statement was also made under this item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

31. The Working Group of the Whole was reconvened under the chairmanship of V. K. Dadhwal (India), in accordance with paragraph 7 of General Assembly resolution 67/113. At its 793rd meeting, on 21 February, the Subcommittee endorsed the report of the Working Group of the Whole, which is contained in annex I to the present report.

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

(a) "A proposal for a new regional centre for space science and technology education in East Asia and the Pacific", by the representative of China;

(b) "Mars 2013", by the representative of Austria;

(c) "A New Asia-Pacific Regional Space Agency Forum initiative: Asian beneficial collaboration through Japanese Experiment Module (Kibo) utilization (Kibo-ABC)", by the representative of Japan;

(d) "Expansion of the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies, hosted by the Kyushu Institute of Technology (Japan): postgraduate study on nanosatellite technologies", by the representative of Japan.

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

33. 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 (see A/AC.105/1031, paras. 2-10). The Subcommittee noted



that the Programme for 2012 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

34. The Subcommittee noted with appreciation the voluntary contributions (cash and in-kind) provided by various Member States and organizations for 2012 (see A/AC.105/1031, paras. 47-48).

35. The Subcommittee noted that the priority areas of the Programme were: (a) environmental monitoring; (b) natural resources management; (c) satellite communications for tele-education and telemedicine applications; (d) disaster risk reduction; (e) developing capabilities in the use of global navigation satellite systems; (f) the Basic Space Science Initiative; (g) space law; (h) climate change; (i) the Basic Space Technology Initiative; and (j) the Human Space Technology Initiative.

## 1. Year 2012

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

36. With regard to the activities of the United Nations Programme on Space Applications carried out in 2012, 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.105/1031, para. 49 and annex I):

(a) The Governments of Argentina, Austria, Chile, Ecuador, Italy, Japan, Latvia and the United States;

(b) Centre for Information on Natural Resources of Chile, Institute for Space Research of the Austrian Academy of Sciences, Italian Space Agency (ASI), Latvian Geospatial Information Agency, National Commission on Space Activities (CONAE) of Argentina, Quito Astronomical Observatory of the National Technical School of Ecuador and University of Tokyo (Japan);

(c) ESA, IAF, International Center for Space Weather Science and Education of Kyushu University (Japan), International Committee on Global Navigation Satellite Systems, ISPRS, Japan Aerospace Exploration Agency (JAXA), National Aeronautics and Space Administration (NASA) of the United States and SWF.

### *Long-term fellowships for in-depth training*

37. 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.

38. The Subcommittee expressed its appreciation to the Government of Japan for expanding the United Nations/Japan Long-term Fellowship Programme on Nanosatellite Technologies. Under that Programme, the Kyushu Institute of Technology would annually accept up to four doctoral and two master's degree students for postgraduate study from 2013 to 2017.

*Technical advisory services*

39. 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.105/1031, paras. 38-43).

**2. Year 2013***Meetings, seminars, symposiums, training courses and workshops*

40. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops for 2013:

(a) United Nations/Pakistan Workshop on Integrated Use of Space Technology for Food and Water Security, to be held in Islamabad from 11 to 15 March;

(b) United Nations/Croatia Workshop on the Applications of Global Navigation Satellite Systems, to be held in Baška, Krk Island, Croatia, from 21 to 25 April;

(c) United Nations/Indonesia International Conference on Integrated Space Technology Applications to Climate Change, to be held in Jakarta from 2 to 4 September;

(d) United Nations/China Workshop on Human Space Technology, to be held in Beijing from 16 to 20 September;

(e) United Nations/Austria/ESA Symposium on Data Analysis and Image Processing for Space Applications and Sustainable Development: Space Weather Instruments and Data Modelling, to be held in Graz, Austria, from 16 to 19 September;

(f) United Nations/IAF Workshop on Space Technology for Economic Development, to be held in Beijing from 20 to 22 September;

(g) United Nations/United Arab Emirates Symposium on Basic Space Technology, to be held in Dubai, United Arab Emirates, from 20 to 23 October;

(h) United Nations/Belarus Workshop on Space Technology Applications for Socioeconomic Benefits, to be held in Minsk from 11 to 15 November 2013.

41. Some delegations expressed their concern that no activities were planned to be held under the United Nations Programme on Space Applications in Latin America and the Caribbean in 2013.

**B. Regional and interregional cooperation**

42. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2011-2013 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.105/1031, annex III).

43. The Subcommittee had before it the educational curriculum on GNSS (ST/SPACE/59), developed for nine-month postgraduate courses at the regional centres for space science and technology education, affiliated to the United Nations.

44. The Subcommittee recalled that the General Assembly, in its resolution 67/113, had welcomed the establishment, in 2012, of the Centre for Space Science and Technology Education for Western Asia, affiliated to the United Nations, and located in Jordan.

45. The Subcommittee welcomed a proposal by the Government of China to establish a regional centre for space science and technology education, hosted by Beihang University in Beijing, under the United Nations Programme on Space Applications. The Subcommittee noted that the Office for Outer Space Affairs would facilitate an evaluation mission in that regard.

46. The Subcommittee recalled that the General Assembly, in its resolution 67/113, 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 the 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.

47. The Subcommittee noted that the nineteenth session of APRSAF had been held in Kuala Lumpur from 11 to 14 December 2012 under the theme “Enriching the quality of life through innovative space programmes”. The Subcommittee further noted that the twentieth session of the Forum would be co-organized by the Government of Japan and the Viet Nam Academy of Science and Technology and would take place in Hanoi.

48. The Subcommittee also noted that the African Leadership Conference on Space Science and Technology for Sustainable Development would be held in Ghana in 2013 and that a working group had been established to formulate the African Space Policy and Strategy.

49. The Subcommittee further noted that APSCO had held its sixth Council Meeting, in Tehran on 17 and 18 July 2012, at which it had approved a number of new projects, reviewed the progress being made on those approved earlier and agreed to hold its next meeting in 2013.

50. 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, which developed a regional space policy for the near future and also, inter alia, created a space experts advisory group. The Subcommittee further noted that the pro tempore secretariat of the Conference had organized a regional meeting under the theme “Use of space for humans and environmental security in the Americas” in Mexico City from 17 to 20 April 2012 and a meeting of

representatives of national space entities, which took place on 12 November 2012 in Santiago.

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

51. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 5, “Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)”.

52. The representatives of Canada, Indonesia, Italy, Japan, Nigeria and Portugal made statements under agenda item 5. During the general exchange of views, statements relating to the item were made by representatives of other member States.

53. 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) Conference room paper entitled “Rio+20 and beyond” (A/AC.105/C.1/2013/CRP.16);

(c) The outcome document of the United Nations Conference on Sustainable Development, entitled “The future we want”, as endorsed by the General Assembly in its resolution 66/288 of 27 July 2012;

(d) The first report by the United Nations System Task Team on the Post-2015 United Nations Development Agenda, entitled “Realizing the future we want for all”.

54. The Subcommittee recalled that the General Assembly, in its resolution 67/113, had recalled 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.

55. The Subcommittee noted that its long-standing achievements encompassed the three United Nations Conferences on the Exploration and Peaceful Uses of Outer Space (UNISPACE I, II and III), held in Vienna in 1968, 1982 and 1999, respectively, and had resulted in many important actions of the Committee and programmatic activities of the Office for Outer Space Affairs.

56. The Subcommittee welcomed paragraph 274 in the outcome document of the United Nations Conference on Sustainable Development, entitled “The future we want”, whereby the Conference recognized the importance of space-technology-based data, in situ monitoring and reliable geospatial information for sustainable development policymaking, programming and project operations.

57. The Subcommittee noted with satisfaction that a side event of the Conference, entitled “Space for sustainable development”, was organized by the Office for Outer Space Affairs with the support of the Governments of Austria and Brazil on 19 June 2012 to increase awareness of the value of space data in addressing sustainable development challenges, including in the area of water resources, marine ecosystems, health care, population growth, climate change, disasters and food security and to discuss the contribution of space-based information and technologies to support the implementation of Conference outcomes and actions.

58. The Subcommittee noted with appreciation that the tenth open informal session of the Inter-Agency Meeting on Outer Space Activities would be organized by the Office for Outer Space Affairs and the United Nations Office for Disaster Risk Reduction on 12 March 2013 in Geneva, and would focus on the theme of “Space and disaster risk reduction: planning for resilient human settlements”, which, in view of the broader development agenda, was a timely initiative, in particular in view of the relevance of the overall concept of resilience.

59. The Working Group of the Whole, reconvened in accordance with General Assembly resolution 67/113, also considered agenda item 5. At its 793rd meeting, on 21 February, the Subcommittee endorsed the recommendations of the Working Group (see annex I to the present report) concerning the implementation of the recommendations of UNISPACE III.

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

60. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 6, “Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment”.

61. The representatives of Canada, China, Egypt, India, Indonesia, Italy, Japan, the Russian Federation and the United States 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.

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

(a) “Developing Conception of China national new generation Earth observation system construction and development”, by the representative of China;

(b) “25 years of the Indian Remote Sensing Satellite (SIRS) series”, by the representative of India;

(c) “Enhancing outreach of Earth observation products and applications in India”, by the representative of India;

(d) “RADAR Imaging Satellite (RISAT-1) of ISRO”, by the representative of India;

(e) “Dust storm monitoring: prediction and allocation of sources”, by the representative of Iraq;

(f) “JAXA’s newest Earth observation satellite, Shizuku: current status and future plans”, by the representative of Japan;

(g) “The practical uses and application status of satellite images in Korea: focusing on KOMPSAT series”, by the representative of the Republic of Korea;

(h) “NOAA meteorological satellite update”, by the representative of the United States;

(i) “ISPRS: information from imagery”, by the observer for ISPRS;

(j) “Desert movement predictor and Farmaboosts: two Earth observation-based applications for pan-African development”, by the observer for ISU.

63. 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 socioeconomic 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; ice-cover monitoring; oceanography; rural development and urban planning; and safety and public health.

64. The Subcommittee recognized 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 socioeconomic development.

65. 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, the SAC-C international mission, Landsat of the United States, Shizuku of Japan and OCEANSAT-2 of India.

66. 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.

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

68. 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 5th GEOSS Asia-Pacific Symposium, held in Tokyo in April 2012, and the ninth plenary session of GEO, hosted by Brazil in Foz do Iguaçu in November 2012. The Subcommittee

further noted that Switzerland would host the next GEO plenary session and ministerial summit in January 2014.

69. The Subcommittee noted the successful conclusion of the 26th plenary meeting of CEOS, hosted by India in October 2012. The Subcommittee also noted that Canada had taken up the chairmanship of CEOS for 2013 and would host its next plenary meeting.

70. The view was expressed that all States should have equal access to remote sensing technology and the data produced by remote sensing technology, at reasonable cost. The delegation expressing that view encouraged the providers of remote sensing data to grant single government licences for developing countries purchasing remote satellite data.

71. The view was expressed that the free availability on the Internet of high-resolution imagery of sensitive areas could pose a risk for national security.

72. The view was expressed that the use of remote sensing for purposes other than peaceful uses was unacceptable.

## V. Space debris

73. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 7, "Space debris".

74. The representatives of Canada, China, the Czech Republic, France, Germany, India, Indonesia, Italy, Japan, the Republic of Korea, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 7. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

- (a) "CNES space debris activities", by the representative of France;
- (b) "Joint Stock Company National Company 'Kazakhstan Gharysh Sapary'", by the representative of Kazakhstan;
- (c) "Results of geostationary orbit and high elliptical orbit monitoring by the International Scientific Optical Network in 2012", by the representative of the Russian Federation;
- (d) "Space debris mitigation", by the representative of Ukraine;
- (e) "The Phoenix project", by the representative of the United States;
- (f) "United States space debris environment and operational updates", by the representative of the United States;
- (g) "ESA debris mitigation activities in 2012", by the observer for ESA;
- (h) "Evolution of the future low-Earth orbit debris environment", by the observer for ESA, in his capacity as the chair of Inter-Agency Space Debris Coordination Committee (IADC);

(i) “Preserving the space environment collaboratively”, by the observer for IAASS.

76. The Subcommittee had before it information on research on space debris, the safety of space objects with nuclear power sources on board and problems relating to the collision of such objects with space debris, containing replies received from Member States and international organizations on the issue (A/AC.105/C.1/107, A/AC.105/C.1/2013/CRP.4 and A/AC.105/C.1/2013/CRP.19).

77. The Subcommittee noted with appreciation the usefulness of the IAF symposium on studies and concepts for active orbital debris removal in describing the complexities of dealing with the issue and the urgency of finding an immediate solution to mitigate debris.

78. The Subcommittee expressed concern over the increasing amount of space debris and encouraged those States which had not yet done so to consider voluntary implementation of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

79. 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 IADC Space Debris Mitigation Guidelines, and that other States had developed their own space debris mitigation standards based on those guidelines.

80. The Subcommittee noted that other States were using the IADC Guidelines and the European Code of Conduct for Space Debris Mitigation as reference points in their regulatory frameworks for national space activities. The Subcommittee further noted that other States had cooperated, in the framework of the ESA space situational awareness programme, to address the issue of space debris.

81. 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.

82. The Subcommittee noted with appreciation the endorsement by the Legal Subcommittee of the agenda item entitled “General exchange of information and views on legal mechanisms relating to space debris mitigation measures, taking into account the work of the Scientific and Technical Subcommittee”.

83. The Subcommittee 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, in-orbit robotic servicing of satellites, and technologies to protect space systems from space debris and to limit the creation of additional space debris.

84. Some delegations expressed the view that increased space debris mitigation measures at the national level and enhanced regional and international cooperation in that field were necessary for assuring safe and secure access to space for all nations, the protection of space assets and the sustainable development of outer space.



85. Some delegations expressed the view that the Scientific and Technical Subcommittee and the Legal Subcommittee should cooperate with the aim of finding a comprehensive solution for space debris mitigation.
86. The view was expressed that, since the future of space exploration largely depended on the effectiveness of space debris mitigation measures, mitigation of space debris and the limitation of its creation should be among the priorities of the work of the Subcommittees.
87. The view was expressed that the Space Debris Mitigation Guidelines of the Committee should be reviewed in view of the activities of agencies operating spacecraft, launches and missions, and the involvement of private sector.
88. The view was expressed that the Subcommittee should consult IADC periodically to stay abreast of future revisions to the IADC Guidelines and evolving technologies and debris mitigation practices.
89. The view was expressed that it was important for information to be swiftly circulated among members of the Subcommittee and IADC on the work and activities undertaken in the field of space debris.
90. Some delegations expressed the view that exchange of knowledge base and data among States was essential for meaningful mitigation strategies and remediation measures.
91. Some delegations expressed 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.
92. The view was expressed that data on space debris should be transparently accessible to all countries.
93. The view was expressed that collaborative mechanisms should be sought in order to establish a registry of international and multinational operators of spacecraft, which would include contact information, information on data centres for the storage and exchange of information on space objects and operational information, and information-sharing procedures.
94. Some delegations expressed the view that it was a responsibility of all spacefaring nations to implement the mitigation measures on a voluntary basis through their respective national mechanisms.
95. 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, including debris derived from space platforms with nuclear power sources on board.
96. Some delegations expressed the view that developing countries should benefit from technical assistance in space debris monitoring provided by spacefaring nations.
97. The view was expressed that developing countries should be enabled to mitigate space debris through capacity-building and transfer of technology, since all States, regardless of their technology and level of development, were equally exposed to the same risks.

98. The view was expressed that retro-reflectors should be mounted on all massive objects, including those which would become inactive after launch, which would enable greater accuracy in determining the position of orbital elements and increase the efficiency of collision avoidance manoeuvres.

99. The view was expressed that, in connection with the problem of space debris, States should take into account the need to preserve the space environment.

100. The view was expressed that the lack of clear requirements and binding norms on the issue of space debris provided a form of protection for those States that had traditionally used technology without any restriction or control and, in some cases, without regard for human life or the environment.

101. 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.

102. Some delegations expressed the view that States should take action to improve technology for monitoring of space debris as a matter of priority.

103. The Subcommittee noted that the General Assembly, in its resolution 67/113, 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.

104. 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.

105. Some delegations expressed the view that information on actions to reduce the creation of space debris should be made available to the Committee, in particular by those States which were largely responsible for creating space debris and by the States that had the capacity to take action with regard to space debris mitigation.

106. The Subcommittee agreed that Member States and international organizations with permanent observer status with the Committee should be invited to provide reports on research on space debris, the safety of space objects with nuclear power sources on board, problems relating to the collision of such space objects with space debris and ways in which debris mitigation guidelines were being implemented.

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

107. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 8, "Space-system-based disaster management support".

108. The representatives of Austria, Canada, China, Egypt, France, Germany, India, Japan, Pakistan, the Russian Federation and the United States made statements under agenda item 8. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the

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

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

- (a) “Russian Federation practices with regard to use of space-based remote sensing data in predicting and monitoring emergencies”, by the representative of the Russian Federation;
- (b) “Universal access to the International Charter on Space and Major Disasters”, by the representative of France;
- (c) “Disaster and emergency management: the contribution of the Italian space system COSMO-SkyMed”, by the representative of Italy;
- (d) “Development strategy for an early warning system for disasters in Mexico”, by the representative of Mexico.

110. The Subcommittee had before it the following:

- (a) Report on the fifth United Nations Platform for Space-based Information for Disaster Management and Emergency Response international workshop, entitled “Strengthening global synergies through knowledge management, portals and networks” (Bonn, Germany, 24-26 April 2012) (A/AC.105/1023);
- (b) Report on activities carried out in 2012 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1027);
- (c) Report of the Secretariat on technical advisory support activities carried out in 2012 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1029);
- (d) Report on the United Nations International Conference on Space-based Technologies for Disaster Management: Risk Assessment in the Context of Global Climate Change (Beijing, 7-9 November 2012) (A/AC.105/1033);
- (e) Conference room paper on the International Expert Meeting on Crowdsourcing Mapping for Disaster Risk Management and Emergency Response carried out in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/C.1/2013/CRP.5);
- (f) Conference room paper on the United Nations Platform for Space-based Information for Disaster Management and Emergency Response: proposed workplan for the biennium 2014-2015 (A/AC.105/C.1/2013/CRP.6).

111. The Subcommittee expressed its appreciation for the efforts of the Office for Outer Space Affairs to bring the reports on the activities of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) in 2012 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 Cameroon, Pakistan and the Philippines and the earthquake in the Islamic Republic of Iran.

112. 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, the European Earth Observation Programme (Copernicus) emergency mapping service, 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).

113. The Subcommittee noted that on 20 February 2013, the International Charter on Space and Major Disasters held an open information meeting in Vienna to promote universal access to the Charter.

114. The Subcommittee noted the adoption by Charter members of the implementation of the principle of universal access, allowing any national disaster management authority, including those in States not members of the Charter, to submit requests for emergency response.

115. The view was expressed that it was necessary to establish complementary relationships between UN-SPIDER and other existing initiatives, including Sentinel Asia, for more effective cooperation and avoidance of duplication of efforts.

116. The view was expressed that it was necessary to continue synergy and collaboration between the Charter and the UN-SPIDER programme.

117. The Subcommittee took note of the expert contributions by Member States and regional support offices in 2012 to all UN-SPIDER technical advisory missions, as well as their sharing of experiences with other interested countries.

118. The Subcommittee noted the wide interest and expert participation in the fifth United Nations Platform for Space-based Information for Disaster Management and Emergency Response international workshop, entitled “Strengthening global synergies through knowledge management, portals and networks”, organized by UN-SPIDER with support from the Government of Germany and held in Bonn, Germany, from 24 to 26 April 2012, and the United Nations International Conference on Space-based Technologies for Disaster Management: Risk Assessment in the Context of Global Climate Change, organized by UN-SPIDER with support from the Government of China and held in Beijing from 7 to 9 November 2012.

119. The Subcommittee noted that on 11 and 12 February 2013, the Office for Outer Space Affairs hosted the fourth annual meeting of the regional support offices of UN-SPIDER in Vienna to review the joint activities implemented in 2012 and to develop a joint workplan for 2013 and for the biennium 2014-2015.

120. The Subcommittee noted that the delegations of Iran (Islamic Republic of), Japan and Pakistan had made presentations on the progress in the drafting of booklets on best practices for disaster management and emergency response. The Subcommittee also noted that UN-SPIDER and its regional support offices agreed to strengthen knowledge management for the provision of advisory services on the use of space-based information for disaster management and emergency response.

121. The Subcommittee noted with satisfaction the signature of the UN-SPIDER regional support office agreement between the Office for Outer Space Affairs and the National Institute of Aeronautics and Space of Indonesia, which took place in Vienna on 19 February 2013, during the session of the Subcommittee.

122. The Subcommittee also noted with satisfaction that the Office for Outer Space Affairs had in February 2013 signed a memorandum of understanding with the International Centre for Integrated Mountain Development, based in Nepal, to establish a UN-SPIDER regional support office in the Himalayan region.

123. The Subcommittee noted the renewed offer and commitment of the Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters (EMERCOM) to host a UN-SPIDER regional support office.

124. The Subcommittee welcomed the fact that UN-SPIDER regional support offices were currently being hosted by 10 national organizations — the Algerian Space Agency, CONAE, the Agustín Codazzi Geographic Institute of Colombia, Károly Róbert University of Hungary, the National Institute of Aeronautics and Space of Indonesia, the Iranian Space Agency, the Nigerian National Space Research and Development Agency, the Pakistan Space and Upper Atmosphere Research Commission, the Romanian Space Agency and the National Space Agency of Ukraine — and by five regional organizations — ADRC, based in Kobe, Japan; the Regional Centre for Mapping of Resources for Development, based in Nairobi; the International Centre for Integrated Mountain Development in Kathmandu; the University of the West Indies, based in Saint Augustine, Trinidad and Tobago; and the Water Center for the Humid Tropics of Latin America and the Caribbean, based in Panama City — bringing the total number of regional support offices to 15.

125. Some delegations expressed the view that the Office for Outer Space Affairs should explore further cooperation agreements with national institutions and interregional organizations involved in the management of natural disasters to develop training programmes related to the application of space technology for disaster management, and expressed support for the establishment of new UN-SPIDER regional support offices in Latin America and the Caribbean.

126. Some delegations expressed the view that it was important to intensify international coordination and cooperation through training programmes in the area of disaster management in the context of the UN-SPIDER programme, particularly in developing countries.

127. 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 2014-2015.

128. The Working Group of the Whole, reconvened pursuant to General Assembly resolution 67/113, also considered agenda item 8. At its 793rd meeting, on 21 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**

129. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 9, “Recent developments in global navigation satellite systems”, and reviewed issues related to the International Committee on Global Navigation Satellite Systems (ICG), the latest developments in the field of GNSS and new GNSS applications.

130. The representatives of Canada, China, France, India, Italy, Japan, 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.

131. The Subcommittee had before it the following documents:

(a) Report on the United Nations/Latvia Workshop on the Applications of Global Navigation Satellite Systems (A/AC.105/1022);

(b) Report of the Secretariat on activities carried out in 2012 in the framework of the workplan of the International Committee on Global Navigation Satellite Systems (A/AC.105/1034);

(c) Note by the Secretariat on the Seventh Meeting of the International Committee on Global Navigation Satellite Systems (A/AC.105/1035);

(d) Working paper submitted by the Russian Federation on the provision of the Russian Global Navigation Satellite System to the international community for free use (A/AC.105/C.1/L.331).

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

(a) “Global Navigation Satellite System (GLONASS) Government policy, status and modernization”, by the representative of the Russian Federation;

(b) “High-accuracy satellite navigation system of the Republic of Kazakhstan”, by the representative of Kazakhstan;

(c) “BeiDou navigation satellite system and international activities”, by the representative of China;

(d) “Quasi-Zenith Satellite System” by the representative of Japan.

133. The Subcommittee also heard a presentation on “ICG and its programme on GNSS applications”, by the representative of the Office for Outer Space Affairs, which served as the executive secretariat of ICG and its Providers’ Forum.

134. The Subcommittee was informed that the Office for Outer Space Affairs, as the executive secretariat of ICG, handled coordination for the planning meetings of ICG and its Providers’ Forum in conjunction with sessions of the Committee and its subsidiary bodies, along with the implementation of a programme on GNSS applications. It was noted that the executive secretariat also maintained a comprehensive information portal for ICG and users of GNSS services.

135. The Subcommittee took note that, pursuant to the ICG workplan, the Office for Outer Space Affairs, through its programme on GNSS applications, concentrated its work on promoting the use of GNSS technologies as tools for scientific

applications, including space weather effects on GNSS, and organizing regional workshops on applications of GNSS and the International Space Weather Initiative.

136. The Subcommittee noted that GNSS applications offered a cost-effective way of pursuing sustainable economic growth while protecting the environment. Satellite navigation and positioning data were now used in a wide range of areas, which included mapping and surveying, monitoring of the environment, precision agriculture and natural resources management, disaster warning and emergency response, aviation, maritime and land transportation and research areas such as climate change and ionospheric studies.

137. The Subcommittee noted that the United Nations/Latvia Workshop on Applications of Global Navigation Satellite Systems had been held in Riga from 14 to 18 May 2012. The Workshop was co-sponsored by the United States, through ICG, and by ESA. The Latvian Geospatial Information Agency had hosted the Workshop on behalf of the Government of Latvia. The overarching objective was to facilitate cooperation in applying GNSS solutions through the exchange of information and the scaling up of capacities among countries in the region.

138. The Subcommittee noted with satisfaction that the seventh meeting of ICG and the ninth meeting of the Providers' Forum, organized by the Government of China, had been held in Beijing from 4 to 9 November 2012 and that the eighth meeting of ICG would be held in Dubai, United Arab Emirates, from 10 to 14 November 2013. The Subcommittee noted the expression of interest by the European Union in hosting the ninth meeting of ICG, in 2014.

139. The Subcommittee 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. The Subcommittee also noted progress made on the ICG and its Providers' Forum workplans, in particular with regard to multi-GNSS monitoring to improve performance and interoperability, as well as interference detection and mitigation.

140. The Subcommittee noted that ICG continued to promote greater transparency in GNSS systems, in line with the adopted principle of transparency that every provider should publish documentation that describes signal and system information, policies of provision and minimum levels of performance for its open services.

141. The Subcommittee noted with appreciation the publication of an educational curriculum on GNSS (ST/SPACE/59), which was a unique result of the deliberations of the regional workshops on GNSS applications since 2006. It was noted that this curriculum would be made available to the regional centres for space science and technology education, affiliated to the United Nations, and supplement the proven standard model education curricula of the regional centres developed through the programme on GNSS applications.

142. The Subcommittee commended the Office for Outer Space Affairs for its outstanding performance in its capacity as the executive secretariat of ICG and its Providers' Forum, and expressed appreciation for the efforts of the Office in promoting the use of GNSS throughout its programme on GNSS applications.

143. The Subcommittee noted that the global positioning systems of the United States continued to set a high standard of reliability, accuracy and service to the international community. It was noted that this constellation continued an expanded 24+3 slot configuration to provide better coverage and availability around the world. The Subcommittee also took note of the intention of the United States to keep the Global Positioning System (GPS) as a central pillar in an emerging international system of GNSS and that, as new systems emerged, signal compatibility and interoperability among GNSS, as well as transparency in the provision of open civil services, would be key factors in ensuring that civil users around the world received the maximum benefit from GNSS applications.

144. The Subcommittee took note that the Governments of the United Kingdom and the United States had reached a common understanding of intellectual property rights related to GPS. It was noted that this understanding was part of a broader shared effort to advance compatibility and interoperability among civil satellite navigation systems and transparency in civil service provision.

145. The Subcommittee noted with appreciation the financial contributions made by the United States to the Office for Outer Space Affairs in support of GNSS-related activities, ICG and its Providers' Forum.

146. The Subcommittee noted that the Russian Federation's Global Navigation Satellite System (GLONASS) constellation had been completed and currently consisted of 29 satellites in orbit, 23 of which being fully operational, 2 serving as orbital spares, 3 in the process of testing and 1 in the process of commissioning, thus providing full coverage of the entire planet.

147. The Subcommittee also noted the continued development of a new generation of GLONASS-K satellites in order to increase precision and operational capabilities, with a view to attaining an accuracy of 1.4 metres within two years and an accuracy of 60 centimetres by 2020.

148. The Subcommittee also noted that the Government of the Russian Federation had declared the prolongation of its commitment to provide GLONASS standard precision signals to the international community, including the International Civil Aviation Organization, on a non-discriminatory basis for a period of not less than 15 years without levying a direct charge on users.

149. The Subcommittee noted that Galileo, the future full global satellite navigation system under development in Europe, was scheduled to become available, with as many as 18 of the planned 30 satellites, in 2014 and that innovative receiver technologies as Galileo-based application programmes had been developed in a wide range of domains (in all modes of transport, precision agriculture and personal mobility). Two successful launches of four Galileo satellites, launched from the Guiana Space Centre, Europe's spaceport, in October 2011 and October 2012, were also noted.

150. The Subcommittee further noted that the European Geostationary Navigation Overlay Service (EGNOS) had been operational since 2009 and had made available satellite systems that were suitable for safety critical applications such as flying aircraft or navigating ships through narrow channels.

151. The Subcommittee noted that Italy continued to be an active member of ICG, as one of the founders of the European EGNOS and Galileo satellite navigation



system, and that it had developed national application projects aimed at fostering the use of satellite navigation, harmonizing them with European projects.

152. The Subcommittee noted 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.

153. 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 and better air traffic management. It was noted that GAGAN was compatible and interoperable with other space-based augmentation systems, and that it would provide seamless navigation services, along with other systems. The Indian Regional Navigation Satellite System (IRNSS), with seven satellites — three in geostationary equatorial orbit and four in geosynchronous orbit — was currently in the implementation phase. The full constellation was expected to be completed in 2015.

154. The Subcommittee noted that the Quasi-Zenith Satellite System of Japan would be expanded and upgraded into an operational and regional satellite-based GNSS for the benefit of the countries of the Asia-Pacific region.

155. The Subcommittee noted that the International GNSS Service (IGS), as a key component of the Global Geodetic Observing System, incorporated GPS and GLONASS with resulting orbits, clocks, station positions and velocities in the common International Terrestrial Reference Frame. It was noted that IGS was currently engaged in an ICG-endorsed project, the Multi-GNSS Experiment, a global activity to demonstrate data observations and analysis of all available GNSS, which was a complement to the multi-GNSS Asia campaign coordinated by Japan for tracking of Japan's Quasi-Zenith Satellite System.

## VIII. Space weather

156. In accordance with a decision taken at its forty-ninth session, in 2012, the Subcommittee considered agenda item 10, "Space weather". The Subcommittee recalled that, at its forty-ninth session, it had agreed that an agenda 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 (A/AC.105/1001, para. 226).

157. The representatives of Canada, China, Ecuador, Egypt, Germany, Indonesia, Japan, the Republic of Korea, the Russian Federation and the United States made statements under agenda item 10. A statement was also made by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were made by

representatives of other member States. The observer for WMO also made a statement under the item.

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

- (a) “New initiatives by China”, by the representative of China;
- (b) “Space weather application for navigation and radio communication in Indonesia”, by the representative of Indonesia;
- (c) “Space weather: South Africa’s abilities and capabilities”, by the representative of South Africa;
- (d) “International Centre for Space Weather Science and Education”, by the representative of Japan;
- (e) “International Space Weather Initiative update”, by the representative of the United States;
- (f) “Solar Max”, by the representative of the United States;
- (g) “MiniMax24 observation campaign”, by the observer for SCOSTEP;
- (h) “International Committee on Global Navigation Satellite Systems and its programme on applications of global navigation satellite systems (GNSS)”, by the Office for Outer Space Affairs.

159. The Subcommittee had before it the following:

- (a) Education Curriculum: Global Navigation Satellite Systems (ST/SPACE/59);
- (b) Report on the United Nations/Austria Symposium on Data Analysis and Image Processing for Space Applications and Sustainable Development: Space Weather Data, held in Graz, Austria, from 18 to 21 September 2012 (A/AC.105/1026);
- (c) Report on the United Nations/Ecuador Workshop on the International Space Weather Initiative, held in Quito from 8 to 12 October 2012 (A/AC.105/1030).

160. The Subcommittee noted that the objectives of the item on space weather were as follows:

- (a) To provide benchmark measurements of the responses of the magnetosphere, the ionosphere, the lower atmosphere and the Earth’s surface in order to identify global processes and drivers that affected the terrestrial environment and climate;
- (b) To further the global study of the Sun-Earth system in order to understand the external and historical drivers of geophysical change;
- (c) To foster international scientific cooperation in the study of current and future space weather phenomena;
- (d) To communicate the unique scientific results of space weather research and societal impacts to interested members of the scientific community and to the general public.

161. The Subcommittee expressed its appreciation to the secretariat of the International Space Weather Initiative and the Office for Outer Space Affairs for conducting an international campaign, from 2010 to 2012, aimed at exploring solar-terrestrial interaction and deploying ground-based worldwide instrument arrays for space weather investigation, particularly in developing countries. As a result of that campaign, more than 100 States, of which more than 80 were developing countries, were actively collecting data to be used to understand how space weather, caused by solar variability, could affect space systems and human space flight, electric power transmission, high-frequency radio communications, GNSS signals, long-range radar and the well-being of passengers in high-altitude aircraft.

162. The Subcommittee expressed its appreciation to the secretariat of the International Space Weather Initiative and the Office for Outer Space Affairs for the numerous publications, posters and leaflets they had published and disseminated and for the exhibitions they had organized to promote the International Living with a Star programme and the International Space Weather Initiative among the space science and technology community and the general public, particularly in developing countries.

163. The Subcommittee noted with appreciation that the International Space Weather Initiative newsletter, published by the International Center for Space Weather Science and Education of Kyushu University (Japan), and the Initiative's website ([www.iswi-secretariat.org](http://www.iswi-secretariat.org)), maintained by the Bulgarian Academy of Sciences, provided a comprehensive overview of the extensive activities conducted worldwide between 2010 and 2012 to implement the objectives of the Initiative.

164. The Subcommittee noted with appreciation that Canada, Chile, Ecuador, Germany, Indonesia, Japan, the Republic of Korea, the Russian Federation, South Africa, the United States, SCOSTEP and the Office for Outer Space Affairs had reported on their achievements and the activities they had carried out in 2012 in the framework of the Initiative.

165. The Subcommittee expressed its gratitude for the holding during its current session of the symposium celebrating the tenth anniversary of the International Living with a Star programme at the United Nations and the Austrian Academy of Sciences.

166. The Subcommittee welcomed the fact that the United Nations Programme on Space Applications had organized three workshops on the International Space Weather Initiative, hosted by Egypt in 2010, Nigeria in 2011 and Ecuador in 2012, and the first United Nations/Austria Symposium on Data Analysis and Image Processing for Space Applications and Sustainable Development: Space Weather Data, hosted by Austria in 2012. The Subcommittee also welcomed the upcoming second United Nations/Austria Symposium on Space Weather, scheduled to take place in September 2013, to be hosted by the Austrian Academy of Sciences on behalf of the Government of Austria.

## **IX. Use of nuclear power sources in outer space**

167. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 11, "Use of nuclear power sources in outer space".

168. The representatives of the United States and Venezuela (Bolivarian Republic of) and the representative of Chile, on behalf of the Group of Latin American and Caribbean States, 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.

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

(a) "Curiosity's first six months on Mars: from touchdown to drilling rocks", by the representative of the United States;

(b) "Discussion about the safety issues of space nuclear reactor power system ground tests", by the representative of China.

170. 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).

171. The view was expressed that the Safety Framework would facilitate the conduct of such missions on a bilateral and multilateral basis between States and international intergovernmental organizations. The delegation expressing that view was also of the view that the widespread implementation of the Safety Framework would provide assurance to the global community that nuclear power source applications were being developed, launched and used in a safe manner.

172. The view was expressed that the Safety Framework, in its present form, was not adequate to meet the challenges posed by the use of nuclear power sources in outer space and that, in the regulation of the use of nuclear power sources 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 was also of the view 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.

173. Some delegations expressed the view that more consideration should be given to the use of nuclear power sources in geostationary orbit and low-Earth orbit in order to address the problem of potential collisions of nuclear power source 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.

174. The view was expressed that the proliferation of nuclear power sources in outer space, including terrestrial orbits, should not be allowed, as the effects of the use of nuclear power sources 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.

175. 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.

176. The view was expressed that the use of nuclear power sources in outer space should be as limited as possible and that, while nuclear power sources 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.

177. Pursuant to General Assembly resolution 67/113, 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.

178. At its 793rd meeting, on 21 February, the Subcommittee endorsed the report of the Working Group, including the summary of information from the workshops organized by the Working Group during the forty-eighth and forty-ninth sessions of the Subcommittee, in 2011 and 2012. The report of the Working Group is contained in annex II to the present report.

## **X. Near-Earth objects**

179. In accordance with General Assembly resolution 67/113, the Scientific and Technical Subcommittee considered agenda item 12, "Near-Earth objects".

180. The representatives of Canada, France, Germany, Indonesia, Japan, Mexico, Pakistan, the Republic of Korea, the Russian Federation and the United States, along with the representative of Chile, on behalf of the Group of Latin American and Caribbean States, made statements under agenda item 12. The observer for the Association of Space Explorers also made a statement. During the general exchange of views, statements relating to the item were also made by representatives of other member States and by the observers for IAU and SGAC.

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

(a) "The National Aeronautic and Space Administration's NEO Program Office and 2012 DA14", by the representative of the United States;

(b) "Japan's Asteroid Missions Hayabusa and Hayabusa-2", by the representative of Japan;

(c) "The status of the European Space Agency's near-Earth object segment", by the observer for ESA.

182. 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.1/106);

(b) 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.329);

(c) Final report of the Action Team on Near-Earth Objects (2012-2013) (A/AC.105/C.1/L.330).

183. The Subcommittee heard a message from the Canadian astronaut Chris Hadfield on board the International Space Station about the close fly-by with Earth of the asteroid 2012 DA14 at a safe distance of 27,700 kilometres from the Earth on 15 February, discovery and subsequent tracking of which demonstrated the importance of coordinated international efforts to predict and, if necessary, mitigate such threats posed by near-Earth objects in the future.

184. The Subcommittee expressed its sympathy to the Government and the people of the Russian Federation for the damage caused by a large meteorite that crashed in the Chelyabinsk region on 15 February 2013.

185. The Subcommittee noted with appreciation the work of the Action Team on Near-Earth Objects under the chairmanship of Sergio Camacho (Mexico) in finalizing the recommendations for an international response to the NEO impact threat and progress made on coordinating international NEO detection efforts.

186. The Subcommittee noted that activities in protecting the Earth from an asteroid impact involved diverse and complex scenarios that could be best addressed through international cooperation, and consisted of early detection and tracking of an NEO, determining the risk of impact and deciding on a course of action in cases where the risk was relatively high and if a deflection was necessary.

187. The Subcommittee also noted the importance of information-sharing in discovering, monitoring and physically characterizing the potentially hazardous NEO population to ensure that all nations, in particular developing countries with limited capacity in predicting and mitigating an NEO impact, were aware of potential threats.

188. The Subcommittee noted with appreciation the international efforts undertaken by member States to detect, catalogue and characterize NEOs, such as the Minor Planet Center, the Arecibo and Goldstone radio telescope facilities, the Korea Microlensing Telescope network (KMTNet), the NEO Program Office of NASA and the European-Union-funded NEOShield project, coordinated by the German Aerospace Centre.

189. The Subcommittee noted that the Near-Earth Object Surveillance Satellite (NEOSSat), to be launched on 25 February 2013, as a mission led by Canada with an international science team, would be the first satellite dedicated to searching for NEOs from space.

190. The Subcommittee noted with satisfaction the initiative of the European Commission to facilitate and fund the NEOShield project. The Subcommittee expressed its encouragement for continued funding of similar vital efforts in preparing techniques for preventing an NEO impact on a long-term basis.

191. The Subcommittee welcomed a worldwide research project being undertaken on samples 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,

the results of which were to be used for scientific purposes and future management of threats posed by near-Earth objects.

192. The Subcommittee also 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 return to Earth in 2020, and the Origins Spectral Interpretation Resource Identification Security Regolith Explorer (OSIRIS-Rex) sample-return mission of the United States, to be launched in 2016 to arrive at the target near-Earth object in 2019 and return to Earth in 2023.

193. The Subcommittee noted the past and upcoming missions to investigate near-Earth objects, including the Dawn mission of the United States, which had completed its year-long mission in August 2012. The mission, in which for the first time a spacecraft had entered orbit around an object in the main asteroid belt, a densely populated belt and a source of most near-Earth objects, would provide further information about the nature of asteroids and the main asteroid belt.

194. The Subcommittee noted a number of international meetings to discuss international collaborative efforts on near-Earth objects, such as the 2013 IAA Planetary Defense Conference, to be held in Flagstaff, Arizona (United States) from 15 to 19 April 2013.

195. The Subcommittee also noted that the twenty-eighth General Assembly of IAU, held in Beijing from 20 to 31 August 2012, had adopted a resolution on the establishment of an international near-Earth object early warning system, as proposed by the IAU Division III Working Group on Near-Earth Objects.

196. The Subcommittee welcomed the initiatives of SGAC, such as the “Move an Asteroid” technical paper competition and the “Find an Asteroid Campaign”, to raise awareness about NEO issues among the public and, in particular, young people.

197. In accordance with General Assembly resolution 67/113, the Working Group on Near-Earth Objects was reconvened under the chairmanship of Sergio Camacho (Mexico). The Working Group held seven meetings.

198. At its 795th meeting, on 22 February, the Subcommittee endorsed the report of the Working Group (see annex III to the present report), including the recommendations contained therein for an international response to the near-Earth object impact threat.

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

199. In accordance with General Assembly resolution 67/113, the Scientific and Technical Subcommittee considered agenda item 13, “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>

200. The representatives of Austria, China, Germany, Japan, the Russian Federation, South Africa, the United States and Venezuela (Bolivarian Republic of)

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

made statements under agenda item 13. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

- (a) “International Association for the Advancement of Space Safety: goals and initiatives”, by the observer for IAASS;
- (b) “Report of the Workshop on the Protection of the Space Environment”, by the representative of Japan;
- (c) “Status and current activities at the German Space Situational Awareness Centre”, by the representative of Germany;
- (d) “An International Civil Aviation Organization for Space”, by the observer for IAASS;
- (e) “Project QB50”, by the representative of Belgium.

202. The Subcommittee had before it the following:

- (a) Note by the Secretariat and conference room paper on experiences and practices related to the long-term sustainability of outer space activities (A/AC.105/C.1/104 and A/AC.105/C.1/2013/CRP.15);
- (b) Working paper submitted by the Russian Federation and Ukraine on technology safeguards associated with cooperation in the field of the exploration and use of outer space for peaceful purposes and in the development and operation of space rockets and rocket equipment (A/AC.105/C.1/L.322);
- (c) Working paper submitted by the Russian Federation on the long-term sustainability of outer space activities (A/AC.105/L.285);
- (d) Working papers prepared by expert groups A-D of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/C.1/L.324-327);
- (e) Conference room papers containing the preliminary draft reports and proposed candidate guidelines prepared by expert groups A-D of the Working Group (A/AC.105/C.1/2013/CRP.11, A/AC.105/C.1/2013/CRP.12, A/AC.105/C.1/2013/CRP.13 and A/AC.105/C.1/2013/CRP.14);
- (f) Conference room paper containing a progress report by the Chair of the Working Group (A/AC.105/C.1/2013/CRP.10);
- (g) 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.1/2013/CRP.18).

203. A conference room paper, containing the proposed candidate guidelines of expert groups A-D of the Working Group on the Long-term Sustainability of Outer Space Activities, as presented at a joint meeting held on 15 February 2013 (A/AC.105/C.1/2013/CRP.23), was also made available to the Subcommittee during the session.



204. In accordance with General Assembly resolution 67/113, the Working Group on the Long-term Sustainability of Outer Space Activities was reconvened under the chairmanship of Peter Martinez (South Africa).

205. The Subcommittee welcomed the progress made under the agenda item within the Working Group and in the four expert groups, in accordance with the terms of reference and methods of work of the Working Group.

206. Some delegations expressed the view that the long-term sustainability of outer space activities was a matter of concern not only for current and aspiring space actors but also for the international community as a whole.

207. Some delegations expressed the view that any measures or sets of guidelines that might be recommended should be consistent with international law, including the five United Nations treaties on outer space.

208. Some delegations expressed the view that the consideration of the long-term sustainability of outer space activities should not result in any instrument to be used as a pretext for States that had been able to develop space capabilities to restrict or impose controls on other States wishing to exercise their legitimate right to use space technology for societal benefit.

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

210. The view was expressed that in the development of guidelines and recommendations on the long-term sustainability of outer space activities, there was a need to address the common responsibility of States for the protection of the space environment, or parts of it, at the national, regional and global levels. There was also a need to take into account the different circumstances, particularly each State's contribution to the evolution of a particular problem and its ability to prevent, reduce and control the extent of that problem.

211. 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, security 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.

212. 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. It was therefore important to thoroughly assess the nature of the draft guidelines and recommendations being prepared by the Working Group, in particular their effectiveness in implementation and how they related to other guidelines and principles adopted by the Committee. As voluntary guidelines were being proposed, for instance, on timely and accurate information-sharing, there was a need for further analysis on how effective those guidelines would be if there were no binding rule.

213. The view was expressed that serious consideration should be given to the complex issues involved in the long-term sustainability of outer space activities. In that sense, it was important not to rush the process. The preliminary reports and

draft guidelines put forward by expert groups had to be carefully considered at the national level.

214. The view was expressed that the Subcommittee should provide more support to the Working Group and to the expert groups for more effective and coordinated work. It was important for the expert groups to be guided in their work, and closer coordination between them should be established.

215. The view was expressed that more extensive use of plenary meetings for discussing matters relating to the item on the long-term sustainability of outer space activities should be sought and considered by the Subcommittee.

216. The view was expressed that the Subcommittee should focus on formulating consensus-based and targeted solutions, as well as political and technical options, on the basis of best practices and experiences, including standards, rather than considering national regulations of individual States as models to be directly applied.

217. The view was expressed that, in order to achieve the sustainability of outer space activities, the development of binding norms should be promoted. It was also 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 that responsibility was not transferrable.

218. The view was expressed that the Working Group, in its examination of the long-term sustainability of outer space activities, through the consideration of current practices, operating procedures, technical standards and national policies associated with the safe conduct of space activities throughout all phases of the mission life cycle, should give due regard to the role of space systems in affecting sustainable development on Earth and take into account the concerns and interests of all countries, consistent with the peaceful uses of outer space.

219. The view was expressed that the proliferation of space debris and the possibility of collision and interference posed serious threats to the long-term sustainability of outer space activities, particularly in the low-Earth orbit and the geostationary orbit environment, and that the Committee had a fundamental role to play by addressing those challenges through its work in the scientific, technical and legal fields.

220. The concern was expressed that the issue of the use of nuclear power sources in outer space and its direct implications on sustainability and safety was not directly dealt with the work of the Working Group on the Long-term Sustainability of Outer Space Activities.

221. The view was expressed that an international monitoring centre for near-Earth space should be created to track space objects.

222. The Subcommittee welcomed with satisfaction the holding on the afternoon of 14 February of a workshop on experiences and practices in the conduct of sustainable space activities, organized by the Working Group in accordance with its terms of reference and methods of work and with the participation of national non-governmental and private sector entities.

223. The Subcommittee expressed its gratitude to ESPI and SWF for organizing a seminar on the margins of the current session in support of that workshop.

224. The Subcommittee noted with appreciation that the Chair of the group of governmental experts on transparency and confidence-building measures in outer space activities, Viktor Vasiliev, had addressed the Working Group during the present session, providing information on the work being currently carried out within the framework of the group of governmental experts.

225. At its 794th meeting, on 21 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**

226. In accordance with General Assembly resolution 67/113, the Scientific and Technical Subcommittee considered agenda item 14, "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.

227. A statement under agenda item 14 was made by the representative of Chile on behalf of the Group of Latin American and Caribbean States. The observer for ITU also made a statement under the item. During the general exchange of views, statements relating to the item were made by representatives of member States.

228. The Subcommittee heard a scientific and technical presentation entitled "Q/V band experimentation and use: involvement of digital divide-affected countries" by the representative of Italy.

229. The Subcommittee welcomed the information provided in the annual report for 2012 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.1/2013/CRP.17. The Subcommittee invited ITU to continue submitting reports to it.

230. Some delegations expressed 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 particular account the needs of developing countries and the geographical position of certain countries. 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.

231. Some delegations expressed 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.

232. Some delegations expressed 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 fifty-first session of the Scientific and Technical Subcommittee**

233. In accordance with General Assembly resolution 67/113, the Subcommittee considered agenda item 15, "Draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee".

234. The Subcommittee noted that the Secretariat had scheduled the fifty-first session of the Subcommittee to be held from 10 to 21 February 2014.

235. The Subcommittee noted that, in accordance with General Assembly resolution 67/113, it would submit to the Committee its proposal on the draft provisional agenda for the fifty-first 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. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.
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. Near-Earth objects.
10. Use of nuclear power sources in outer space.

(Work for 2014 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))

11. Long-term sustainability of outer space activities.

(Work for 2014 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))

12. 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.

(Single issue/item for discussion)

13. Draft provisional agenda for the fifty-second 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.

236. The Subcommittee noted that the topic for the symposium to be organized in 2014 by the Office for Outer Space Affairs, 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 “Commercial applications of GNSS”.

237. The Subcommittee noted the conclusion of the item under the multi-year workplan entitled “Near-Earth objects” and agreed that the item should be introduced as a regular item on the agenda of the Subcommittee.

238. The Subcommittee agreed that the agenda item on the implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) be renamed as “Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda”.

239. The Subcommittee recalled the agreement of the Committee (A/67/20, para. 347) to organize at the fifty-sixth session of the Committee, in 2013, a half-day event entitled “Space: building the future today”, consisting of a panel of prominent women in the space-related field of space explorations, science, technology, education, business and policy and aiming to address the contribution of women to space activities, to mark the fiftieth anniversary of the first space flight by a woman, Valentina Tereshkova.

240. The Subcommittee noted that, as requested by the Committee, a planning meeting was held on the margins of the present session, on 20 February, and that activities planned to mark the anniversary included (a) a dedicated panel, comprised of prominent women in space activities, to be held on the afternoon of 12 June 2013, the first day of the fifty-sixth session of the Committee, (b) an evening event for the public, to be held on 13 June 2013 in the city of Vienna and (c) an exhibition at the Vienna International Centre during the session of the Committee.

241. The Subcommittee had before it a non-paper by the Secretariat with a draft plan of the anniversary event, which is contained on the website of the Office for

Outer Space Affairs. Interested delegations were invited to provide their comments and ideas to the Office at their earliest convenience.

242. The Subcommittee agreed that the number of scientific and technical presentations should be limited to a maximum of four presentations per meeting and that member States and permanent observers of the Committee should pay due attention to the need to keep the overall number of presentations in the session at a reasonable level. The Subcommittee also agreed that the Secretariat might, if necessary, and upon consultation with the member State and permanent observer concerned, reduce the number of presentations requested.

## Annex I

### Report of the Working Group of the Whole

1. In accordance with paragraph 7 of General Assembly resolution 67/113, the Scientific and Technical Subcommittee, at its fiftieth session, reconvened its Working Group of the Whole. From 13 to 21 February 2013, the Working Group held three meetings, under the chairmanship of V. K. Dadhwal (India). The Working Group considered the United Nations Programme on Space Applications, space-system-based disaster management support, the implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) and the draft provisional agenda for the fifty-first session of the Subcommittee, to be held in 2014. At its third meeting, on 21 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 document referred to under item 4 of the agenda of the Subcommittee (see para. 33 in the main body of the report above). 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.

3. The Working Group agreed that it should not continue its consideration of the item on the United Nations Programme on Space Applications, and that the consideration of the item in the future should be carried out by the Subcommittee in its plenary sessions.

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

4. For its consideration of space-system-based disaster management support, the Working Group had before it the documents referred to under item 8 of the agenda of the Subcommittee (see para. 110 in the main body of the report above). The Working Group noted the proposed workplan for the biennium 2014-2015 for the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER).

5. The Working Group agreed that it should not continue its consideration of the item on space-system-based disaster management support, and that the consideration of the item should in the future be carried out by the Subcommittee in its plenary sessions.

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

6. For its consideration of the implementation of the recommendations of UNISPACE III, the Working Group had before it the documents referred to under item 5 of the agenda of the Subcommittee (see para. 53 in the main body of the report above).

7. The Working Group recalled its decision that it should not continue reviewing the implementation of the recommendations of UNISPACE III, and that, at the present session of the Subcommittee, the Working Group should study the outcome of the United Nations Conference on Sustainable Development (Rio+20), 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 the results of that Conference.
8. The Working Group welcomed the conference room paper entitled “Rio+20 and beyond” (A/AC.105/C.1/2013/CRP.16), which provided a background to the discussions. The Working Group noted that the paper provided an overview of the process for implementing the outcome of the Conference at the intergovernmental level and outlined the mechanisms for consideration of the post-2015 development agenda.
9. The Working Group encouraged member States of the Committee to liaise nationally with their respective authorities and departments responsible for the intergovernmental processes related to the Conference and the post-2015 development agenda in order to promote the inclusion in those processes of the relevance of space science and technology applications and use of space-derived geospatial data.
10. The Working Group requested the Office for Outer Space Affairs to take an active part in the United Nations System Task Team on the Post-2015 United Nations Development Agenda and other inter-agency mechanisms for the processes related to the United Nations Conference on Sustainable Development and the post-2015 development agenda, within its capacities, in order to influence the inclusion of space-related references and elements in the documentation generated by the United Nations Secretariat under those processes.
11. The Working Group recommended that the modalities of a mechanism for closer interaction between the Subcommittee and the Committee on the two processes should be elaborated further by the Committee at its fifty-sixth session, in June 2013. The aim of such a mechanism could be to provide a platform for the sharing of information on actions taken by member States of the Committee and the Office for Outer Space Affairs in their involvement to promote the role of space technology applications and use of space-derived geospatial data in those processes.
12. The Working Group noted with satisfaction that, in relation to the recommendations of the Action Team on Public Health, a strategy meeting was held on the margins of the current session to discuss a follow-up initiative for an open community approach to tele-health and telemedicine and the use of space technology in spatial epidemiology and spatial ecotoxicology issues, emanating from the international expert meeting on “Improving public health through space technology applications: an open-community approach”, held from 30 July to 1 August 2012 in Bonn, Germany.
13. Based upon a proposal by the delegation of Canada, the Working Group agreed that the topic of global health be included as an ongoing subject of discussion under its broader consideration of the processes related to the United Nations Conference on Sustainable Development and the post-2015 development agenda.



14. The Working Group recommended that the agenda item of the Subcommittee on UNISPACE III be renamed so that it connected more closely with the United Nations Conference on Sustainable Development and the post-2015 development agenda, taking into account the new agenda item of the Committee on “Space and sustainable development”.

**Draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee**

15. The Working Group of the Whole noted that, in accordance with General Assembly resolution 67/113, the Scientific and Technical Subcommittee would submit to the Committee its proposal for the draft provisional agenda for the fifty-first session of the Subcommittee, to be held in 2014. The Working Group recommended that the draft provisional agenda, as well as any organizational matters of the Subcommittee, be considered directly in the Subcommittee under its agenda item 15.

## Annex II

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

1. At its 777th meeting, on 11 February 2013, 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 2010-2015, adopted by the Subcommittee at its forty-seventh session, in 2010 (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 had before it a conference room paper on the exploration of certain safety issues during the terrestrial trials of the power sources of space nuclear reactors (A/AC.105/C.1/2013/CRP.20), presented by the delegation of China, and a non-paper by the delegation of France on the proposal to initiate a discussion on updating the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.

4. The Working Group reviewed its workplan, noting that no workshop was held during the current session, since no member State or international intergovernmental organization had confirmed its participation in response to the note verbale from the Secretariat. However, the Working Group noted that several member States had indicated their plans to make a presentation in 2014 on their progress in implementing the Safety Framework. The Working Group agreed that the current workplan did not need to be changed and, as a result, decided to proceed as originally agreed by the Subcommittee.

5. The view was expressed that the Working Group was now at a crossroads, having not yet produced any work related to objective (b) of its workplan. In that respect, recalling that safety should be a prime goal for designers and operators of space NPS missions and that such a goal needed guidance in terms of standards and criteria, which did not sufficiently exist in section 5 of the Safety Framework, it was proposed, in that spirit, that a guide should be drafted by the Working Group.

6. Some delegations expressed the view that the technical guidance in the Safety Framework, as stated in its introduction, "... provides an international consensus on measures needed to achieve safety and applies to all space NPS applications without

prejudice”. Moreover, sections 5.1 and 5.2 of the Safety Framework provided technical guidance and criteria for satisfying the fundamental safety objective to “protect people and the environment in Earth’s biosphere from potential hazards associated with relevant launch, operation, and end-of-service phases of space nuclear power source applications”.

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

8. The Working Group noted that two years remained in the workplan to identify technical topics for potential additional work of the Working Group to further enhance safety in the development and use of space NPS applications.

9. The Working Group noted the interest of some member States and international intergovernmental organizations in making further presentations relevant to the implementation of the Safety Framework. In that connection, the Working Group requested the Secretariat to invite, in March 2013, 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 provide technical presentations on those issues to the Subcommittee at its fifty-first session, in 2014.

10. The Working Group also requested the Secretariat to schedule all presentations to be given under the invitation referred to above during one or, if necessary, two meetings held on the same day during the first week of the fifty-first session of the Subcommittee, in 2014.

11. The Working Group agreed to hold a teleconference during the summer of 2013 in order to review the replies received to the invitation referred to in paragraph 8 above and to plan its activities for the rest of 2013.

12. At its third meeting, on 21 February 2013, the Working Group adopted the present report.

## **Appendix**

### **Summary of information from the workshops organized by the Working Group during the forty-eighth and forty-ninth sessions of the Subcommittee, in 2011 and 2012**

1. At its forty-eighth session, in 2010, the Subcommittee endorsed the Working Group’s workplan for the period 2010-2015 (see A/AC.105/958, para. 134). The workplan had the following elements:

(a) To promote and facilitate the implementation of the Safety Framework for Nuclear Power Source Applications in Outer Space (made available by the Secretariat in document A/AC.105/934 and by the secretariat of the International Atomic Energy Agency (IAEA) as a joint publication of the Subcommittee and IAEA) by providing information pertinent to challenges faced by member States and international intergovernmental organizations, in particular those considering or initiating involvement in applications of 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 (see A/AC.105/958, annex II, para. 7).

2. The Working Group agreed that it would advance these objectives by conducting workshops during the period 2011-2013. The workshops would consist of two types of presentations: (a) presentations by member States and international intergovernmental organizations considering or initiating involvement in applications of NPS in outer space, summarizing their plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework or specific elements thereof; and (b) presentations by member States with experience in space NPS applications, providing information pertinent to addressing the challenges in implementing the Safety Framework.

3. A total of nine workshop presentations were made by Argentina, China, the Russian Federation and the United States of America, as well as by the European Space Agency.

4. Four of those workshop presentations were made in response to the Subcommittee's invitation to member States and international intergovernmental organizations with experience in space NPS applications to provide information on their implementation of the Safety Framework (see A/AC.105/958, annex II, para. 8). The presentations addressed four specific aspects of the Safety Framework: (a) safety in design and development; (b) risk assessments; (c) emergency preparedness and response; and (d) accident consequence mitigation.

5. The other five workshop presentations were made by member States and international intergovernmental organizations, summarizing their plans, progress to date and any challenges faced or foreseen in implementing the Safety Framework or specific elements thereof. Those specific challenges were as follows:

(a) The mission launch authorization process for countries with NPS applications but without the capacity to launch the applications;

(b) The coordination of emergency preparedness and response with other countries over which the space mission would fly;

(c) The implementation of the prime responsibility of the organization conducting the space NPS mission and establishment of formal arrangements between it and all other relevant participants in the space mission;

(d) The allocation of responsibilities between any international intergovernmental organization and its member States in implementing the "Guidance for Governments" section of the Safety Framework;

(e) The organization of launch safety and emergency preparedness and response for different launch phases and accident scenarios.

6. The Working Group concluded that the workshops had fulfilled the objective of promoting and facilitating the implementation of the Safety Framework by providing information pertinent to challenges faced by member States and international intergovernmental organizations. Those member States and

international intergovernmental organizations which made presentations at the workshops emphasized that the Safety Framework had provided a valuable foundation for the development of national and international intergovernmental safety frameworks for space NPS applications.

7. The Working Group also concluded that the five challenges referred to in paragraph 5 above were essentially related to policy, management and coordination of space NPS activities (as contained in sections 3 and 4 of the Safety Framework). Such activities were highly specific to the Government or Governments involved in authorizing and/or approving space NPS missions, and the Working Group was of the view that it would be difficult to develop generic guidance for any of those five areas at this time.

8. The Working Group noted that more challenges might be identified in the future, as member States and international intergovernmental organizations continued to implement the Safety Framework.

## Annex III

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

1. Pursuant to paragraph 7 of General Assembly resolution 67/113, the Scientific and Technical Subcommittee, at its fiftieth session, reconvened its Working Group on Near-Earth Objects under the chairmanship of Sergio Camacho (Mexico). The Working Group held seven meetings, from 15 to 22 February 2013.
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 and on the capability for the exchange, processing, archiving and dissemination of data for the purpose of NEO threat detection;
  - (c) Finalization of the agreement on international procedures for handling the NEO threat and engagement with international stakeholders;
  - (d) Consideration of the final report of the Action Team on Near-Earth Objects;
  - (e) Review of progress made in activating the work of an international asteroid warning network and the mission planning and operations group, and assessment of their performance.
3. The Working Group heard the following scientific and technical presentations:
  - (a) “Report of the Action Team on Near-Earth Objects: recommendations for an international response to an NEO threat”, by the Chair of the Action Team on Near-Earth Objects;
  - (b) “NEO threat detection and warning: plans for an international asteroid warning network”, by the representative of the United States;
  - (c) “Mitigation of the NEO impact threat (NEOShield)”, by the representative of Germany;
  - (d) “Recommendations of the Action Team on Near-Earth Objects for an international response to the Near-Earth Object impact threat”, by the representative of the United States and the observer for ESA;
  - (e) “Fly-by of 2012 DA14: preliminary results”, by the representative of the United States;
  - (f) “Chelyabinsk event of 15 February 2013: initial preliminary analysis”, by the representative of the United States.
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.1/106).

5. The Working Group noted that, during the current session of the Subcommittee, technical presentations had been given on close-approaching asteroids, new missions to asteroids to learn about their nature and composition, and the recommendations of the Action Team on Near-Earth Objects for an international response to the threat of an NEO impact on Earth. To elucidate the recommendations, technical presentations were made on plans for an international asteroid warning network, on mitigation capabilities being developed by space agencies and international consortia to respond to an asteroid threat, and on functional aspects of the international coordination needed among space agencies for planning and operating mitigation campaigns in case of an NEO impact threat.
6. The Working Group was informed that in 2012 the intersessional work of the Action Team on Near-Earth Objects had been carried out: (a) on the margins of the fifty-fifth session of the Committee on the Peaceful Uses of Outer Space; (b) in a workshop to provide information to the Action Team on the international analysis of the potentially hazardous asteroid known as 2011 AG5; (c) in a teleconference of representatives of entities that could form an international asteroid warning network; and (d) through electronic correspondence. The Working Group noted that a second meeting of representatives of space agencies was held on the margins of the fifty-fifth session of the Committee to discuss the terms of reference for the establishment of a space mission planning advisory group. The Working Group would offer recommendations for consideration by member States.
7. The Working Group had before it the final report of the Action Team on Near-Earth Objects (A/AC.105/C.1/L.330), which contained current knowledge on the structure and organization of ongoing efforts in the field of NEOs, including the number and size distribution of NEOs that had been found. The report also identified gaps in ongoing work where additional coordination was required and/or where member States or organizations could make contributions.
8. The Working Group also had before it the 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.329). The Working Group noted that the report contained a summary of the findings on which the Action Team had based its recommendations for a coordinated international response to the NEO impact threat.
9. The Working Group noted that there were three primary components of threat mitigation: (a) discovering hazardous asteroids and comets and identifying those objects requiring action; (b) planning a mitigation campaign that included deflection and/or disruption actions and civil protection activities; and (c) implementing a mitigation campaign, if the threat warranted it. The Working Group emphasized the value of finding hazardous NEOs as soon as possible in order to better characterize their orbits. This would help to avoid unnecessary NEO threat mitigation missions or facilitate the effective planning of missions, should they be deemed necessary.
10. The recommendations that follow are meant to ensure: (a) awareness among all nations of potential threats; (b) the coordination of civil protection activities by nations that could be affected by an impact, directly or indirectly; and (c) the design and coordination of mitigation activities by those which might play an active role in any eventual deflection or disruption campaign.

11. Upon consideration of the two reports referred to above, which were presented by the Action Team, the Working Group recommended that the following actions should be taken:

(a) An international asteroid warning network (IAWN), open to contributions by a wide spectrum of organizations, should be established by linking together the institutions that were already performing, to the extent possible, the proposed functions, including discovering, monitoring and physically characterizing the potentially hazardous NEO population and maintaining an internationally recognized clearing house for the receipt, acknowledgment and processing of all NEO observations. Such a network would also recommend criteria and thresholds for notification of an emerging impact threat;

(b) IAWN should interface with the relevant international organizations and programmes to establish linkages with existing national and international disaster response agencies in order to study and plan response activities for potential NEO impact events and to recommend strategies using well-defined communication plans and procedures to assist Governments in their response to predicted impact consequences. This does not limit the possibility of organizing, in this respect, additional international specialized advisory groups, if necessary;

(c) A space mission planning advisory group (SMPAG) should be established by States Members of the United Nations that have space agencies. The group should include representatives of spacefaring nations and other relevant entities. Its responsibilities should include laying out the framework, timeline and options for initiating and executing space mission response activities. The group should also promote opportunities for international collaboration on research and techniques for NEO deflection.

12. The groups recommended above should have their work facilitated by the United Nations on behalf of the international community.

13. The Working Group recommended that the Action Team on Near-Earth Objects should assist in the establishment of IAWN and SMPAG. The Action Team should inform the Subcommittee of the progress in the establishment of both groups. Once established, IAWN and SMPAG should report on an annual basis on their work.

14. The Working Group agreed that all recommendations contained in the present report should be implemented with no cost to the regular budget of the United Nations.

15. The Working Group encouraged the specialized agencies of the United Nations, member States and their institutions to follow near-Earth object developments on a regular basis, for example via the following web pages: <http://neo.jpl.nasa.gov>, [www.jpl.nasa.gov/asteroidwatch](http://www.jpl.nasa.gov/asteroidwatch), <http://neo.ssa.esa.int> and <http://neoshield.net>.

16. At its seventh meeting, on 22 February 2013, 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 67/113, the Scientific and Technical Subcommittee, at its fiftieth session, reconvened its Working Group on the Long-term Sustainability of Outer Space Activities.
2. The Working Group held five meetings, from 12 to 21 February 2013, under the chairmanship of Peter Martinez (South Africa).
3. In accordance with its terms of reference and methods of work, the Working Group 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.1/104 and A/AC.105/C.1/2013/CRP.15);
  - (b) Working paper submitted by the Russian Federation and Ukraine on technology safeguards associated with cooperation in the field of the exploration and use of outer space for peaceful purposes and in the development and operation of space rockets and rocket equipment (A/AC.105/C.1/L.322);
  - (c) Working paper submitted by the Russian Federation on the long-term sustainability of outer space activities (A/AC.105/L.285);
  - (d) Working papers prepared by expert groups A-D of the Working Group (A/AC.105/C.1/L.324, A/AC.105/C.1/L.325, A/AC.105/C.1/L.326 and A/AC.105/C.1/L.327);
  - (e) Conference room papers containing the preliminary draft reports and proposed candidate guidelines prepared by expert groups A-D of the Working Group (A/AC.105/C.1/2013/CRP.11, A/AC.105/C.1/2013/CRP.12, A/AC.105/C.1/2013/CRP.13 and A/AC.105/C.1/2013/CRP.14);
  - (f) Conference room paper containing a progress report by the Chair of the Working Group (A/AC.105/C.1/2013/CRP.10);
  - (g) Conference room paper containing a list of points of contact for the Working Group and members of expert groups A-D (A/AC.105/C.1/2013/CRP.18).
4. The Working Group recalled the dedicated web page established by the Secretariat ([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, and 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 on the Peaceful Uses of Outer Space and to the national points of contact of the Working Group.
5. At the first meeting, the Chair of the Working Group presented a report on the intersessional progress made since the forty-ninth session of the Subcommittee, held in February 2012. The Working Group noted that the four expert groups had held informal coordination meetings on the margins of the fifty-fifth session of the

Committee in June 2012, and the sixty-third International Astronautical Congress, held in Naples, Italy, in October 2012. The reports of those informal coordination meetings had been made available on the web page referred to above.

6. The Working Group also noted that all four expert groups were meeting on the margins of the current session of the Subcommittee to further consider their draft reports and proposed candidate guidelines.

7. In accordance with the decision taken by the Working Group during the forty-ninth session of the Subcommittee concerning reports of the expert groups and information flow from the expert groups to the Working Group (A/AC.105/1001, annex IV, para. 16), the Chair invited the co-chairs of the expert groups to introduce the preliminary draft expert group reports and the proposed candidate guidelines that were to be considered by the expert groups at the current session of the Subcommittee. The Chair also introduced the conference room paper containing a progress report by the Chair of the Working Group, which included a proposal for the structure of the report of the Working Group (see A/AC.105/C.1/2013/CRP.10, annex).

8. At its second meeting, on 14 February 2012, the Working Group noted that the Chair would compile, as soon as possible after the end of the fiftieth session of the Subcommittee, the set of candidate guidelines proposed by the four expert groups, as at 15 February 2013, for translation into all official languages of the United Nations. That document would be produced for the purpose of assisting delegations in giving their considered views on the emerging candidate guidelines and in guiding the expert groups and the Chair of the Working Group in drafting the report of the Working Group. The Working Group also considered the proposal of the Chair on the structure of the report of the Working Group. Comments were received on that proposed structure.

9. The Working Group noted with appreciation the workshop that had been held on 14 February 2013, in accordance with its multi-year workplan. A brief report on the workshop is contained in the appendix to the present report. The presentations made during the workshop are found on the web page of the Office for Outer Space Affairs, under the page dedicated to the fiftieth session of the Subcommittee, as well as on the page dedicated to the Working Group.

10. At the third meeting of the Working Group, on 18 February 2013, the Chair of the Working Group invited the Chair of the group of governmental experts on transparency and confidence-building measures in outer space activities to present its activities to the Working Group. The presentation was given in accordance with paragraph 16 of the terms of reference and methods of work (A/66/20, annex II), which mandated the Working Group to invite contributions from States members of the Committee, as well as to invite contributions from and/or consider and decide on appropriate liaison with United Nations intergovernmental bodies, including the group of governmental experts. The presentation by the Chair of that group highlighted the complementary nature of those two processes. The Chair of the group of governmental experts also shared an outline of the draft report with the Working Group, outlining the principal elements of the work of the group of governmental experts.

11. At its fourth meeting, on 19 February 2013, the Working Group noted that the co-chairs of the expert groups had proposed that the expert groups meet on the

margins of and/or during the fifty-sixth session of the Committee, to be held in Vienna in June 2013.

12. The Working Group recalled that the Committee, at its fifty-fifth session, in 2012, had agreed that the Secretariat should schedule the work of the Committee at its next session, in 2013, in such a manner as to enable the Working Group to benefit from interpretation services (A/67/20, para. 348). In that regard, the Working Group noted that its Chair would consult with the Chair of the Committee and the Secretariat regarding the scheduling of the session of the Committee in 2013.

13. In accordance with what was agreed by the Working Group during the forty-ninth session of the Scientific and Technical Subcommittee (A/AC.105/1001, annex IV, para. 16), the expert groups held a joint meeting on 15 February 2013. During that meeting, the co-chairs of the expert groups presented the current status of their work and the progress that had been made at the current session, while also highlighting some overlaps in the emerging candidate guidelines that would need to be addressed as the guidelines were consolidated into the final report of the Working Group.

14. At its fifth meeting, on 21 February 2013, the Working Group adopted the present report.

## **Appendix**

### **Report on the workshop organized by the Working Group on the Long-term Sustainability of Outer Space Activities on 14 February 2013**

In accordance with the multi-year workplan for the Working Group, member States of the Committee were invited to include in their delegations representatives of national non-governmental organizations and of private sector entities having experience in space activities to provide information on their experiences and practices in the conduct of sustainable space activities at a workshop to be held in conjunction with the fiftieth session of the Subcommittee.

The organization of the workshop was undertaken by the Chair of the Working Group in consultation with the co-chairs of the expert groups and the national points of contact of the Working Group. Delegations were requested to propose presentations for the workshop through their national points of contact.

The aim of the workshop was to create an opportunity for national non-governmental organizations and private sector entities to present information on their experiences as inputs for consideration by the expert groups in formulating their conclusions and recommendations to the Working Group.

The following presentations were delivered:

(a) “Long-term sustainability of outer space activities: a satellite industry perspective”, by Patricia Cooper, Satellite Industry Association (United States); Aarti Holla, European Satellite Operators Association (Belgium); and Stewart Sanders, Space Data Association (United Kingdom);

(b) “International Organization for Standardization space standards”, by Fredrick Slane, Space Infrastructure Foundation (United States);

(c) “China Aerospace Science and Technology Corporation efforts on dealing with space debris towards space long-term sustainability”, by Zizheng Gong, China Aerospace Science and Technology Corporation (China);

(d) “The Japanese space industry’s efforts regarding long-term sustainability of space activities”, by Shigeyoshi Hata, Society of Japanese Aerospace Companies (Japan);

(e) “Eutelsat practice and views on long-term sustainability”, by Marion Petitjean and David Zamora, Eutelsat (France);

(f) Statement on long-term sustainability, by Laurent Jourdainne, Arianespace (France).

Presenters emphasized that the space industry entities had several decades of experience in operations in outer space and that private sector investments in space activities were long-term investments that provided essential services for society. The private sector therefore had a strong interest in promoting responsible uses of outer space to ensure the long-term sustainability of outer space activities.

It was noted that industry associations played a significant role in promoting the long-term sustainability of outer space activities through promoting cooperation and information exchange. Such associations were already providing channels for information exchange among satellite operators on an operational basis.

The importance of standards and guidelines supporting the long-term sustainability of space activities was emphasized. In some cases, there were already existing standards or guidelines that could be more widely promoted and adopted. For example, it was noted that the existing Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space were already observed by a number of space operators.

It was noted that industry also played a role in the development of technologies and operational practices to promote the long-term sustainability of outer space activities. Examples were given of research and development activities in industry in the realm of space debris impact effects and mitigation. Examples of operator practices in satellite relocation and end-of-life passivation and disposal procedures were also highlighted.

In addition, examples of national laws were presented, some of which included provisions for the protection of the space environment. Other national statutory practices that could support the long-term sustainability of space activities included pre-maneuvre notifications, impact avoidance plans and end-of-life disposal strategies. However, it was important to consider industry inputs and perspectives in the development of regulatory frameworks and to allow industry operators sufficient time to implement new regulatory provisions.