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* ISWI Newsletter – Vol. 5 No. 106                                08 October 2013 *
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*       I S W I = International Space Weather Initiative          *
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Attachment(s):

- (1) "GNSS_SW", 322 KB pdf, 37 pages.
- (2) "Feb2013_AC105_1038E", 700 KB pdf, 52 pages.
- (3) "Jun2013_A_68_20E", 700 KB pdf, 52 pages.

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:                               Re:
:                               Some recent reports, described below.
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Dear ISWI Participant:

There are three noteworthy reports attached.

[1]
 Conference proceedings
 "International round-table on Extreme space weather:
 Geomagnetic storms, GNSS disruptions and the impact
 on vital functions in society"....Stockholm, 5-6 September 2012.

[2]
 Report of the Scientific and Technical Subcommittee on its
 fiftieth session, held in Vienna from 11 to 22 February 2013.

[3]
 Report of the Committee on the Peaceful Uses of Outer Space
 Fifty-sixth session, 12-21 June 2013.

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Please note this important point: These official reports from
the United Nations (generally translated into the six official
languages of the UN) are *entirely* based on the inputs from
member States (i.e., countries). Therefore, if you wish to
recommend something or comment upon something, then the task
is much easier than you think. Contact your representative to
have your views aired during these annual Vienna meetings.
Also to be considered: Become a representative for your country
and attend the meetings. Then you can air your views directly.
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All big things begin with someone's idea.

Respectfully yours,
 . George Maeda
 . The Editor
 . ISWI Newsletter

**General Assembly**Distr.: General
7 March 2013

Original: English

Please note the items of Space Weather on document page 25 (pdf page 25).
- Editor, ISWI Newsletter.

**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**

Contents

	<i>Page</i>
I. Introduction	3
A. Attendance	3
B. Adoption of the agenda	4
C. General statements	5
D. National reports	7
E. Symposium	7
F. Adoption of the report of the Scientific and Technical Subcommittee	8
II. United Nations Programme on Space Applications	8
A. Activities of the United Nations Programme on Space Applications	8
B. Regional and interregional cooperation	10
III. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)	12
IV. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment	13
V. Space debris	15
VI. Space-system-based disaster management support	18
VII. Recent developments in global navigation satellite systems	22



VIII.	Space weather	25
IX.	Use of nuclear power sources in outer space	27
X.	Near-Earth objects.....	29
XI.	Long-term sustainability of outer space activities	31
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	35
XIII.	Draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee	36
Annexes		
I.	Report of the Working Group of the Whole	39
II.	Report of the Working Group on the Use of Nuclear Power Sources in Outer Space	42
III.	Report of the Working Group on Near-Earth Objects	46
IV.	Report of the Working Group on the Long-term Sustainability of Outer Space Activities	49

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), 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.¹

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

¹ *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.

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), 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://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) 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.



United Nations

Report of the Committee on the Peaceful Uses of Outer Space

**Fifty-sixth session
(12-21 June 2013)**

**General Assembly
Official Records
Sixty-eighth Session
Supplement No. 20**

Please note the items of Space Weather
on document page 18 (pdf page 24).
- Editor, ISWI Newsletter.

General Assembly
Official Records
Sixty-eighth Session
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Contents

<i>Chapter</i>	<i>Page</i>
I. Introduction	1
A. Meetings of subsidiary bodies	1
B. Adoption of the agenda	1
C. Membership	2
D. Attendance	2
E. General statements	3
F. Adoption of the report of the Committee	6
II. Recommendations and decisions	6
A. Ways and means of maintaining outer space for peaceful purposes	6
B. Report of the Scientific and Technical Subcommittee on its fiftieth session	8
1. United Nations Programme on Space Applications	9
2. Implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III)	12
3. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment	13
4. Space debris	14
5. Space-system-based disaster management support	15
6. Recent developments in global navigation satellite systems	16
7. Space weather	18
8. Use of nuclear power sources in outer space	19
9. Near-Earth objects	19
10. Long-term sustainability of outer space activities	20
11. 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	23
12. Draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee	24
C. Report of the Legal Subcommittee on its fifty-second session	25
1. Status and application of the five United Nations treaties on outer space	25
2. Information on the activities of international intergovernmental and non-governmental organizations relating to space law	27

3.	Matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union	27
4.	National legislation relevant to the peaceful exploration and use of outer space . . .	28
5.	Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space	29
6.	Examination and review of the developments concerning the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets	30
7.	Capacity-building in space law	30
8.	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	31
9.	Review of international mechanisms for cooperation in the peaceful exploration and use of outer space	32
10.	Draft provisional agenda for the fifty-third session of the Legal Subcommittee . . .	33
D.	Space and sustainable development	34
E.	Spin-off benefits of space technology: review of current status	37
F.	Space and water	38
G.	Space and climate change	39
H.	Use of space technology in the United Nations system	41
I.	Future role of the Committee	42
J.	Other matters	43
1.	Composition of the bureaux of the Committee and its subsidiary bodies for the period 2014-2015	44
2.	Membership of the Committee	44
3.	Observer status	45
4.	Organizational matters	45
5.	Draft provisional agenda for the fifty-seventh session of the Committee	46
K.	Schedule of work of the Committee and its subsidiary bodies	46

Chapter I

Introduction

1. The Committee on the Peaceful Uses of Outer Space held its fifty-sixth session in Vienna from 12 to 21 June 2013. The officers of the Committee were as follows:

<i>Chair:</i>	Yasushi Horikawa (Japan)
<i>First Vice-Chair:</i>	Filipe Duarte Santos (Portugal)
<i>Second Vice-Chair/Rapporteur:</i>	Piotr Wolanski (Poland)

A. Meetings of subsidiary bodies

2. The Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fiftieth session in Vienna from 11 to 22 February 2013, under the chairmanship of Félix Clementino Menicocci (Argentina). The report of the Subcommittee was before the Committee (A/AC.105/1038).

3. The Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space held its fifty-second session in Vienna from 8 to 19 April 2013, under the chairmanship of Tare Charles Brisibe (Nigeria). The report of the Subcommittee was before the Committee (A/AC.105/1045).

B. Adoption of the agenda

4. At its opening meeting, the Committee adopted the following agenda:
 1. Opening of the session.
 2. Adoption of the agenda.
 3. Statement by the Chair.
 4. General exchange of views.
 5. Ways and means of maintaining outer space for peaceful purposes.
 6. Report of the Scientific and Technical Subcommittee on its fiftieth session.
 7. Report of the Legal Subcommittee on its fifty-second session.
 8. Space and sustainable development.
 9. Spin-off benefits of space technology: review of current status.
 10. Space and water.
 11. Space and climate change.
 12. Use of space technology in the United Nations system.
 13. Future role of the Committee.
 14. Other matters.

15. Report of the Committee to the General Assembly.

C. Membership

5. In accordance with General Assembly resolutions 1472 A (XIV), 1721 E (XVI), 3182 (XXVIII), 32/196 B, 35/16, 49/33, 56/51, 57/116, 59/116, 62/217, 65/97 and 66/71 and decisions 45/315, 67/412 and 67/528, the Committee on the Peaceful Uses of Outer Space was composed of the following 74 States: Albania, Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belgium, Benin, Bolivia (Plurinational State of), Brazil, Bulgaria, Burkina Faso, Cameroon, Canada, Chad, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kazakhstan, Kenya, Lebanon, Libya, Malaysia, Mexico, Mongolia, Morocco, Netherlands, Nicaragua, Niger, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Senegal, Sierra Leone, Slovakia, South Africa, Spain, Sudan, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay, Venezuela (Bolivarian Republic of) and Viet Nam.

D. Attendance

6. Representatives of the following 64 States members of the Committee attended the session: Algeria, Argentina, Armenia, Australia, Austria, Azerbaijan, Belgium, Bolivia (Plurinational State of), Brazil, Bulgaria, Burkina Faso, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Jordan, Kazakhstan, Kenya, Lebanon, Libya, Malaysia, Mexico, Morocco, Netherlands, Nigeria, Pakistan, Peru, Philippines, Poland, Portugal, Republic of Korea, Romania, Russian Federation, Saudi Arabia, Senegal, Slovakia, South Africa, Spain, Sweden, Switzerland, Syrian Arab Republic, Thailand, Tunisia, Turkey, Ukraine, United Kingdom, United States, Venezuela (Bolivarian Republic of) and Viet Nam.

7. At its 660th meeting, on 12 June, the Committee decided to invite, at their request, observers for Belarus, Côte d'Ivoire, the Dominican Republic, El Salvador, Ghana, Guatemala, Israel, Luxembourg, Panama and the United Arab Emirates, as well as the Holy See, to attend its fifty-sixth session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee concerning status.

8. At the same meeting, the Committee decided to invite, at the request of the Sovereign Military Order of Malta, the observer for that organization 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 it would not involve any decision of the Committee concerning status.

9. Also at the same meeting, the Committee decided to invite, at the request of the European Union, the observer for that organization 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 it would not involve any decision of the Committee concerning status.

10. Observers for the Economic and Social Commission for Asia and the Pacific (ESCAP), the Economic and Social Commission for Western Asia and the International Telecommunication Union (ITU) attended the session.

11. The session was attended by observers for the following intergovernmental organizations with permanent observer status with the Committee: the Asia-Pacific Space Cooperation Organization (APSCO), the Association of Remote Sensing Centres in the Arab World, the European Organization for Astronomical Research in the Southern Hemisphere (ESO), the European Space Agency (ESA), the European Telecommunications Satellite Organization (EUTELSAT-IGO), the International Mobile Satellite Organization, the International Organization of Space Communications, the International Telecommunications Satellite Organization and the Regional Centre for Remote Sensing of North African States. The observer for the International Institute for the Unification of Private Law (Unidroit) also attended the session.

12. The session was also attended by observers for the following non-governmental organizations with permanent observer status with the Committee: the European Space Policy Institute (ESPI), the International Academy of Astronautics, the International Astronautical Federation (IAF), the International Institute of Space Law (IISL), the International Law Association (ILA), the International Society for Photogrammetry and Remote Sensing, the National Space Society (NSS), the Prince Sultan bin Abdulaziz International Prize for Water (PSIPW), the Scientific Committee on Solar-Terrestrial Physics (SCOSTEP), the Secure World Foundation (SWF), the Space Generation Advisory Council (SGAC) and the World Space Week Association (WSWA).

13. At its 660th meeting, the Committee decided to invite, at the request of the Inter-Islamic Network on Space Sciences and Technology (ISNET), the observer for that organization to attend its fifty-sixth session and to address it, as appropriate, on the understanding that it would be without prejudice to further requests of that nature and that it would not involve any decision of the Committee concerning status.

14. A list of representatives of States members of the Committee, States not members of the Committee, United Nations entities and other organizations attending the session is contained in A/AC.105/2013/INF/1 and Corr.1.

E. General statements

15. Statements were made by representatives of the following States members of the Committee during the general exchange of views: Algeria, Argentina, Austria, Belgium, Brazil, Canada, Chile, China, Cuba, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kenya, Libya, Malaysia, Mexico, Nigeria, Pakistan, Poland, Republic of Korea, Romania, Russian Federation, Saudi Arabia, South Africa, Switzerland, Thailand, Tunisia, Ukraine, United States, Venezuela (Bolivarian Republic of) and Viet Nam.

Statements were also made by the observer for Guatemala on behalf of the Group of Latin American and Caribbean States, and the representative of France, together with the observer for the European Union, on behalf of the European Union. The observers for Belarus, Ghana and Luxembourg also made statements. The observers for IAF, ESA, ESO, EUTELSAT-IGO, NSS, SGAC, SWF and WSWA also made statements.

16. At the 660th meeting, the Chair delivered a statement highlighting the role played by the Committee and its Subcommittees in promoting efforts to further space exploration and research and in bringing the benefits of space technology to global sustainable development goals. He stressed the need to strengthen regional and interregional cooperation in the field of space activities and in capacity-building, and to ensure closer coordination between the Committee and other intergovernmental bodies involved in the post-2015 development agenda.

17. At the 662nd meeting, on 13 June, the Director of the Office for Outer Space Affairs of the Secretariat made a statement in which she reviewed the work carried out by the Office during the previous year, including outreach activities and cooperation and coordination with United Nations entities and international intergovernmental and non-governmental organizations. She also highlighted the current financial status of the Office and stressed the importance of availability of financial and other resources for the successful implementation of the programme of work of the Office.

18. The Committee 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.

19. The Committee congratulated China on its successful launch, on 11 June 2013, of the fifth manned space flight mission, to be performed by three crew members, one of whom was the second female astronaut from China (taikonaut).

20. The Committee also congratulated Azerbaijan on the successful launch, on 8 February 2013, of its first national telecommunications satellite.

21. The Committee further congratulated Ecuador on the launch into orbit of its first satellite, NEE-01 Pegaso, which was carried out on 25 April 2013 from Jiuquan, China.

22. The Committee noted with appreciation the special panel on the theme “Space: building the future today”, which met to mark the fiftieth anniversary of the first space flight by a woman, Valentina V. Tereshkova, and to address the contribution of women to space activities. The panel was moderated by the Director of the Office for Outer Space Affairs. A welcome address was given by the Director-General of the United Nations Office at Vienna. The panel comprised the following women prominent in space activities: Valentina V. Tereshkova (Russian Federation), Abimbola H. Alale (Nigeria), Roberta Bondar (Canada), Amalia Ercoli Finzi (Italy), Chiaki Mukai (Japan), Marion Paradas (France) on behalf of Géraldine Naja (ESA), Julie A. Sattler (United States), Maureen Williams (Argentina) and Liu Yang (China) representing the fields of space exploration, science, technology, applications, business, policy and law. A video message was delivered by astronaut Karen Nyberg (United States), who was on board the International Space Station at

the time, commemorating the fiftieth anniversary of the first space flight by a woman.

23. The Committee also noted with appreciation the exhibition held at the Vienna International Centre during the present session of the Committee to celebrate the fiftieth anniversary of the first space flight by a woman, while also featuring photographs and biographies of other women astronauts. Contributions were made by Canada, Japan, the Russian Federation and its agency for tourism of the Yaroslavl Region, the Universities Space Research Association, the Office for Outer Space Affairs and the United Nations Postal Administration.

24. The Committee further noted with satisfaction the discussion by the panel of women astronauts and cosmonauts on the theme “Women in space: the next 50 years”, organized jointly by the Office for Outer Space Affairs and the Association of Space Explorers on 13 June 2013 at the Natural History Museum in Vienna.

25. The Committee noted the screening of videos presented on the margins of the current session: “No gravity”, by the delegations of France and Germany, “Shenzhou-9” by the delegation of China, “Japanese space women” by the delegation of Japan and “Chopin: the space concert”, by the delegation of Poland.

26. The Committee heard the following presentations:

(a) “Japan’s international cooperation in the field of space”, by the representative of Japan;

(b) “Recent space activities in Turkey”, by the representative of Turkey;

(c) “Introduction to the movie *Chopin in Space*”, by the representative of Poland;

(d) “Earth observation applications in India for governance and empowering of citizens”, by the representative of India;

(e) “National Space Programme of the Republic of Belarus”, by the observer for Belarus.

27. The Committee noted with satisfaction a side event on the role of ethics in discourse on space sustainability, which was organized by ESPI on 20 June 2013.

28. The Committee noted with appreciation the successful completion of the sixty-third International Astronautical Congress, held in Naples, Italy, from 1 to 5 October 2012. The Committee noted with satisfaction that the sixty-fourth Congress would be hosted by the Government of China and held in Beijing from 23 to 27 September 2013.

29. The Committee welcomed with appreciation the publication entitled *Human Space Technology Initiative: Humans in Space* (ST/SPACE/62).

30. The Committee expressed its deep appreciation and gratitude to Mazlan Othman, Director of the Office for Outer Space Affairs, on the occasion of her retirement, for her outstanding dedication to the work of the Office and to the Committee, and wished her well in her future endeavours.

F. Adoption of the report of the Committee

31. After considering the various items before it, the Committee, at its 674th meeting, on 21 June 2013, adopted its report to the General Assembly containing the recommendations and decisions set out below.

Chapter II

Recommendations and decisions

A. Ways and means of maintaining outer space for peaceful purposes

32. In accordance with paragraph 20 of General Assembly resolution 67/113, the Committee continued its consideration, as a matter of priority, of ways and means of maintaining outer space for peaceful purposes, including consideration of ways to promote regional and interregional cooperation and the role that space technology could play in the implementation of recommendations of the World Summit on Sustainable Development.¹

33. The representatives of Egypt, Greece, Japan, the Russian Federation, the United States and Venezuela (Bolivarian Republic of) made statements under the item. During the general exchange of views, statements relating to the item were also made by other member States, the observer for Guatemala on behalf of the Group of Latin American and Caribbean States, and the representative of France, together with the observer for the European Union, on behalf of the European Union.

34. The Committee heard the following presentations under the item:

(a) “Changing the perspective: atmospheric research on the International Space Station”, by the representative of Germany;

(b) “Space Security Index 2013”, by the representative of Canada;

(c) “Twenty years of history and the future of the Asia-Pacific Regional Space Agency Forum (APRSAF)”, by the representative of Japan;

(d) “Italian master course in space institutions and policies”, by the representative of Italy.

35. The Committee had before it a working paper by the Russian Federation entitled “Prerequisites for promoting the consideration of ways and means of maintaining outer space for peaceful purposes in the context of the issue of the long-term sustainability of outer space activities” (A/AC.105/2013/CRP.19).

36. The Committee agreed that, through its work in the scientific, technical and legal fields, as well as through the promotion of international dialogue and exchange of information on various topics relating to the exploration and use of

¹ See *Report of the World Summit on Sustainable Development, Johannesburg, South Africa, 26 August-4 September 2002* (United Nations publication, Sales No. E.03.II.A.1 and corrigendum).

outer space, it had a fundamental role to play in ensuring that outer space was maintained for peaceful purposes.

37. The Committee emphasized that international, regional and interregional cooperation and coordination in the field of space activities were essential to strengthen the peaceful uses of outer space and to assist States in the development of their space capabilities.

38. The view was expressed that the consideration of the item by the Committee did not correspond with criteria of essential and professional dialogue and thus there was absence of a substantive and visionary approach to practical issues and matters relating to ways and means of maintaining outer space for peaceful purposes. In this regard, that delegation expressed the view that this situation could be improved through maintaining confidence among States and strengthening rational factors in their policy, such as future guidelines on long-term sustainability of outer space activities, in particular those relating to matters of security in outer space.

39. The view was expressed that the working paper (A/AC.105/2013/CRP.19) contained an outline of the existing links between various aspects of ensuring security in space and of safe space operations and defined a set of topics that could motivate the work of the Committee under this item of its agenda, and that the Committee should begin to analyse the legal basis for and the modalities of the exercise of the right to self-defence in accordance with the Charter of the United Nations, as applied to outer space.

40. The view was expressed that the proposal to consider various aspects of the exercise of the right to self-defence in outer space in accordance with the Charter corresponded with criteria of a responsible approach to the use of outer space.

41. The view was expressed that the Committee was the only United Nations body aimed at promoting the peaceful use of outer space and therefore any concept that violated the legal principles of States relating to the peaceful use of outer space, such as the concept of the right to self-defence or the use of weapons in outer space, should not be accepted in the Committee, as this would be in contradiction with its fundamental tasks.

42. Some delegations were of the view that the existing legal regime with respect to outer space was not adequate to prevent the placement of weapons in outer space or to address issues concerning the space environment, and that it was important to further develop international space law in order to maintain outer space for peaceful purposes. In this regard, those delegations were of the view that in order to ensure that outer space was used peacefully and to prevent its militarization, the preparation of binding international legal instruments was necessary.

43. Some delegations were of the view that, in order to maintain the peaceful nature of space activities and prevent the placement of weapons in outer space, it was essential for the Committee to enhance its cooperation and coordination with other bodies and mechanisms of the United Nations system, such as the First Committee of the General Assembly and the Conference on Disarmament.

44. The view was expressed that the Committee had been created exclusively to promote international cooperation with respect to the peaceful uses of outer space and that disarmament issues were more appropriately dealt with in other forums, such as the First Committee of the General Assembly and the Conference on

Disarmament. In that connection, that delegation was of the view that no actions by the Committee were needed regarding the weaponization of outer space and that there was no scarcity of appropriate multilateral mechanisms where disarmament could be discussed.

45. The Committee noted with appreciation that the fifth African Leadership Conference on Space Science and Technology for Sustainable Development would be hosted by Ghana and would be held in Accra in December 2013.

46. The Committee 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 Committee 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 in Santiago on 12 November 2012.

47. The Committee noted with satisfaction 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 Committee further noted that the twentieth session of the Forum would be organized jointly by the Government of Japan and the Viet Nam Academy of Science and Technology and would take place in Hanoi in December 2013.

48. The Committee noted with satisfaction 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.

49. The Committee noted the important role that bilateral and multilateral agreements played in promoting common space exploration objectives and cooperative and complementary space exploration missions.

50. Some delegations informed the Committee about the continuous work in the development, in an open, transparent and inclusive manner, of an international code of conduct for outer space activities, thus offering all interested Member States the opportunity to participate in the process and share their views. These delegations also informed the Committee that the first open-ended consultations had been held in Kyiv on 16 and 17 May 2013 and that a second round of consultations was planned for late 2013.

51. The Committee recommended that, at its fifty-seventh session, in 2014, consideration of the item on ways and means of maintaining outer space for peaceful purposes should be continued, on a priority basis.

B. Report of the Scientific and Technical Subcommittee on its fiftieth session

52. The Committee took note with appreciation of the report of the Scientific and Technical Subcommittee on its fiftieth session (A/AC.105/1038), which contained

the results of its deliberations on the items considered by the Subcommittee in accordance with General Assembly resolution 67/113.

53. The Committee expressed its appreciation to Félix Clementino Menicocci (Argentina) for his able leadership during the fiftieth session of the Subcommittee.

54. The representatives of Canada, China, Colombia, the Czech Republic, Germany, Japan, Mexico, the Russian Federation, Saudi Arabia, South Africa, the United States and Venezuela (Bolivarian Republic of) made statements under the item. 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 also made by other member States.

55. The Committee heard the following presentations:

(a) “The latest development of the Beidou global navigation satellite system”, by the representative of China;

(b) “Japan’s contributions to the International Space Station”, by the representative of Japan;

(c) “Satellite Miranda”, by the representative of the Bolivarian Republic of Venezuela;

(d) “The state of utilization of space technologies by the National Institute of Meteorology of Tunisia”, by the representative of Tunisia;

(e) “Next steps in space exploration”, by the representative of the United States;

(f) “Indian Earth observation, space science and planetary missions: status 2013”, by the representative of India;

(g) “Japan’s contribution to space weather: research and applications”, by the representative of Japan;

(h) “Crisis of floods and mines: Iraq 2013”, by the representative of Iraq;

(i) “Deflecting hazardous asteroids from collision with the Earth by using small asteroids”, by the representative of the Russian Federation.

1. United Nations Programme on Space Applications

(a) Activities of the United Nations Programme on Space Applications

56. The Committee took note of the discussion of the Subcommittee under the item on the United Nations Programme on Space Applications, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 28-50, and annex I, paras. 2 and 3).

57. The Committee endorsed the decisions and recommendations of the Subcommittee and its Working Group of the Whole, which had been convened under the chairmanship of V. K. Dadhwal (India) to consider the item (A/AC.105/1038, paras. 31 and 40).

58. The Committee 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.

59. The Committee took note of the activities of the Programme carried out in 2012, as presented in the report of the Subcommittee (A/AC.105/1038, paras. 36-39) and in the report of the Expert on Space Applications (A/AC.105/1031, annex I).

60. The Committee expressed its appreciation to the Office for Outer Space Affairs for the manner in which the activities of the Programme had been implemented. The Committee also expressed its appreciation to the Governments and intergovernmental and non-governmental organizations that had sponsored the activities.

61. The Committee noted with satisfaction that further progress was being made in the implementation of the activities of the Programme for 2013, as described in the report of the Subcommittee (A/AC.105/1038, para. 40).

62. The Committee also noted with satisfaction that the Office for Outer Space Affairs was helping developing countries and countries with economies in transition to participate in and benefit from activities being carried out under the Programme.

63. The Committee noted with concern the limited financial resources available to implement the Programme and appealed to States and organizations to continue supporting the Programme through voluntary contributions.

64. The Committee took note of the conference room papers entitled "Basic Space Science Initiative 1991-2012" (A/AC.105/2013/CRP.11), "Basic Space Technology Initiative: activities in 2012-2013 and plans for 2014 and beyond" (A/AC.105/2013/CRP.14) and "Human Space Technology Initiative: activities in 2011-2013 and plans for 2014 and beyond" (A/AC.105/2013/CRP.16).

(i) Conferences, training courses and workshops of the United Nations Programme on Space Applications

65. The Committee endorsed the workshops, training courses, symposiums and expert meetings planned for the remainder of 2013 and expressed its appreciation to Austria, Belarus, China, Croatia, Indonesia, Pakistan and the United Arab Emirates, as well as ESA, IAF and the International Committee on Global Navigation Satellite Systems (ICG), for co-sponsoring and hosting those activities (see A/AC.105/1031, annex II).

66. The Committee endorsed the programme of workshops, training courses, symposiums and expert meetings relating to environmental monitoring, natural resource management, global health, global navigation satellite systems (GNSS), basic space science, basic space technology, space law, climate change, human space technology and the socioeconomic benefits of space activities to be held in 2014 for the benefit of developing countries.

(ii) *Long-term fellowships for in-depth training*

67. The Committee 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 fellowships for postgraduate studies on GNSS and related applications.

68. The Committee expressed its appreciation to the Government of Japan, which, through the Kyushu Institute of Technology, had provided fellowships for postgraduate studies on nanosatellite technologies. The Committee also noted with satisfaction that the Long-Term Fellowship Programme on Nanosatellite Technologies would be extended from 2013 to 2017 and would annually accept up to four doctoral and two master's degree students.

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

(iii) *Technical advisory services*

70. The Committee noted with appreciation the technical advisory services provided under the United Nations Programme on Space Applications in support of activities and projects promoting regional cooperation in space applications, as referred to in the report of the Expert on Space Applications (A/AC.105/1031, paras. 38-43).

(iv) *Regional centres for space science and technology education, affiliated to the United Nations*

71. The Committee noted with satisfaction that the United Nations Programme on Space Applications continued to emphasize, promote and foster cooperation with Member States at the regional and global levels to support the regional centres for space science and technology education, affiliated to the United Nations. The highlights of the activities of the regional centres supported under the Programme in 2011-2012 and the activities planned for 2013 were presented in the report of the Expert on Space Applications (A/AC.105/1031, annex III).

72. The Committee noted with satisfaction that an educational curriculum on GNSS (ST/SPACE/59) had been developed for nine-month postgraduate courses at the regional centres for space science and technology education, affiliated to the United Nations.

73. The Committee noted with appreciation that the host countries of the regional centres for space science and technology education, affiliated to the United Nations, were providing the centres with significant financial and in-kind support.

74. The Committee noted with satisfaction that an evaluation mission facilitated by the Office for Outer Space Affairs to Beihang University in Beijing would take place in September 2013, in accordance with the proposal by the Government of China to establish a regional centre for space science and technology education (A/AC.105/1038, para. 45). The Committee further noted that a meeting had been held on the margins of its present session to develop and agree on the terms of

reference for the evaluation mission, which are contained in conference room paper A/AC.105/2013/CRP.21/Rev.1.

(b) International Satellite System for Search and Rescue

75. The Committee noted with satisfaction that the International Satellite System for Search and Rescue (COSPAS-SARSAT) currently had 41 member States and two participating organizations and that there was additional interest in being associated with the programme. The Committee noted with appreciation that the worldwide coverage for emergency beacons had been made possible by the space segment, which consisted of six polar-orbiting and six geostationary satellites provided by Canada, France, the Russian Federation and the United States, along with the European Organization for the Exploitation of Meteorological Satellites (EUMETSAT), as well as by the ground segment contributions made by 26 other countries. The Committee also noted that, since becoming operational in 1982, COSPAS-SARSAT had provided assistance in rescuing at least 34,900 persons in 9,700 search and rescue events and that in 2012 alert data from the system had helped to save 1,950 lives in 662 search and rescue events worldwide.

76. The Committee also noted that the use of satellites in medium-Earth orbit continued to be explored, with a view to improving international satellite-aided search and rescue operations. The Committee welcomed the testing of global positioning system satellites to improve the capabilities of beacons to best take advantage of medium-Earth orbit satellites.

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

77. The Committee took note of the discussion of the Subcommittee under the item on implementation of the recommendations of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III), as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 51-59).

78. The Committee endorsed the recommendations and decisions on the item made by the Subcommittee and its Working Group of the Whole (A/AC.105/1038, para. 59, and annex I, paras. 10, 11, 13 and 14).

79. The Committee noted 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.

80. The Committee also 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, resulting in many important actions of the Committee and programmatic activities of the Office for Outer Space Affairs.

81. The Committee agreed to rename this agenda item “Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda” and further

agreed that the item should be closely interlinked with the new agenda item of the Committee on “Space and sustainable development”.

82. The Committee noted that, in relation to the recommendations of the Action Team on Public Health (action team 6), a strategy meeting had been held on the margins of the fiftieth session of the Scientific and Technical Subcommittee 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.

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

83. The Committee took note of the discussion of the Subcommittee under the item on matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth’s environment, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 60-72).

84. In the course of the discussion, 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.

85. The Committee 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 and SAC-D international missions, Landsat of the United States, Shizuku of Japan and OCEANSAT-2 of India.

86. The Committee 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.

87. The Committee noted with satisfaction that a growing number of developing countries had been actively developing and deploying their own remote sensing satellite systems and utilizing space-based data to advance socioeconomic development, and it stressed the need to continue enhancing the capacities of developing countries with regard to the use of remote sensing technology.

88. The Committee noted with appreciation that on 20 June 2013 Israel had donated a model of an Earth observation satellite “OpSat 2000” to the permanent exhibit of the Office for Outer Space Affairs.

89. The Committee noted the progress made by the Group on Earth Observations (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 Committee also noted the fifth 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 Committee further noted that Switzerland would host the next GEO plenary session and ministerial summit in January 2014.

4. Space debris

90. The Committee took note of the discussion of the Subcommittee under the item on space debris, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 73-106).

91. The Committee endorsed the decisions and recommendations of the Subcommittee on the item (A/AC.105/1038, paras. 101, 103, 104 and 106).

92. The Committee noted with appreciation that some States were already implementing space debris mitigation measures consistent with the Space Debris Mitigation Guidelines of the Committee and/or the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines and that other States had developed their own space debris mitigation standards based on those guidelines. The Committee also 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 Committee further noted that other States had cooperated, in the framework of the ESA space situational awareness programme, to address the issue of space debris.

93. The Committee urged those countries that 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 and/or the IADC Space Debris Mitigation Guidelines.

94. The Committee welcomed the symposium on the theme “Overview of studies and concepts for active orbital debris removal”, organized by IAF during the fiftieth session of the Subcommittee.

95. Some delegations expressed the view that national and international efforts should be intensified to reduce the creation and proliferation of space debris.

96. Some delegations called on the Subcommittee to continue its thorough consideration of the issue of space debris mitigation, in particular by paying greater attention to the problem of debris coming from platforms with nuclear power sources in outer space and to collisions of space objects with space debris and their derivatives, as well as to ways of improving the technology and the collaborative networks for monitoring space debris.

97. Some delegations expressed the view that it would be beneficial for Member States to exchange information on measures to reduce the creation and proliferation of space debris and to mitigate its effects; on the collection, sharing and dissemination of data on space objects; and on re-entry notifications.

98. Some delegations expressed the view that States, especially those States that were largely responsible for the situation with space debris, and those that had the

ability to take action for space debris mitigation, should disseminate information on actions taken to reduce the generation of space debris.

99. Some delegations expressed the view that the Scientific and Technical Subcommittee and the Legal Subcommittee should cooperate in developing legally binding rules relating to space debris.

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

101. The view was expressed that space debris mitigation solutions should not impose undue costs on the emerging space programmes of developing countries.

102. The view was expressed that States that have space objects should follow up on and continuously monitor them.

103. The view was expressed that the early detection and precise tracking of natural and manmade space debris should be encouraged.

104. The view was expressed that it was necessary to promote closer coordination of efforts by spacefaring nations in increasing understanding of the actual status of space debris, including space debris of small size, as well as to establish international practice aimed at enhancing safety of space activities and raising the level of trust through mutual exchange of information.

105. The view was expressed that spacefaring nations should promptly provide relevant reliable information and data to the countries that might be affected by the re-entry of space debris to allow for timely assessment of potential risks.

106. The view was expressed that more consideration should be given to the issue of space debris in the geostationary orbit and low-Earth orbits.

107. The view was expressed that, during the removal of space debris, no unilateral action should be taken by any State with respect to a space object of another State.

108. The view was expressed that retroreflectors should be mounted on all massive objects, including those that 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.

5. Space-system-based disaster management support

109. The Committee took note of the discussion of the Subcommittee under the item on space-system-based disaster management support, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 107-128, and annex I, paras. 4 and 5).

110. The Committee had before it a report on the International Expert Meeting on Crowdsourcing Mapping for Disaster Risk Management and Emergency Response, held in Vienna from 3 to 5 December 2012 (A/AC.105/1044) and a conference room paper entitled "UN-SPIDER regional support offices meeting on the implementation of the planned 2013-2014 programme activities" (A/AC.105/2013/CRP.12).

111. The Committee noted with satisfaction the voluntary contributions being made by Member States, including cash contributions from Austria, China and Germany, and encouraged Member States to provide, on a voluntary basis, all the support

necessary, including financial support, to the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER) to enable it to carry out its workplan for the biennium 2014-2015. The Committee noted with appreciation that the programme had also benefited from the services of associate experts and experts provided by Austria, China, Germany and Turkey.

112. The Committee 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 Committee noted that the information and services being delivered under the UN-SPIDER programme were making a valuable contribution to mitigating the consequences of natural disasters and called on Member States to continue supporting the programme.

114. The Committee noted with satisfaction the signature of the UN-SPIDER regional support office agreement between the Office for Outer Space Affairs and the Ministry for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters (EMERCOM) of the Russian Federation, which took place in Vienna on 19 June 2013, during the session of the Committee.

115. The view was expressed that attendance by representatives of UN-SPIDER regional support offices at training courses for project managers for the International Charter on Space and Major Disasters, including the upcoming one to be held at ESA in Italy in June 2013, would strengthen the role of the regional support Offices and UN-SPIDER in supporting the implementation of the universal access initiative of the Charter, which opens the service to all Member States.

6. Recent developments in global navigation satellite systems

116. The Committee took note of the discussion of the Subcommittee under the item on recent developments in global navigation satellite systems, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 129-155).

117. The Committee noted with appreciation that ICG continued to make significant progress towards encouraging compatibility and interoperability among global and regional space-based positioning, navigation and timing systems and promoting the use of GNSS and their integration into infrastructures, particularly in developing countries.

118. The Committee expressed its appreciation to the Office for Outer Space Affairs for its continued support as executive secretariat for ICG and its Providers' Forum. In that regard the Committee 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, was available to the regional centres for space science and technology education,

affiliated to the United Nations, and supplemented the proven standard model education curricula of the regional centres developed through the programme on space applications.

119. The Committee noted with appreciation that the seventh meeting of ICG and the ninth meeting of its Providers' Forum had been held in Beijing from 4 to 9 November 2012, that the tenth meeting of the Provider's Forum had been held in Vienna on 10 June 2013, and that the eighth meeting of ICG would be held in Dubai, United Arab Emirates, from 10 to 14 November 2013. The Committee also noted the expression of interest by the European Union in hosting the ninth meeting of ICG, in 2014.

120. The Committee noted that South Africa and the European Union had agreed to cooperate on GNSS applications and services.

121. The Committee noted that the United Kingdom and the United States had reached a common understanding of intellectual property rights related to global positioning systems. 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.

122. The Committee noted that two additional operational satellites had been successfully launched in October 2012 as part of the Galileo satellite navigation system, and that these satellites had joined the two existing satellites that had been orbiting the Earth since October 2011, forming together a mini-constellation of four satellites needed for validation and fine-tuning of the Galileo navigation satellite system. In this regard, the Committee noted that the responsibility for operating the Galileo satellite navigation system would be conferred to the European GNSS Agency, based in Prague.

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

124. The Committee 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.

125. The Committee 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.

126. The Committee noted that India was planning to launch the first satellite of the Indian Regional Navigation Satellite System, IRNSS-1A, as the first satellite of the seven satellite constellation designed for providing positional, navigational and timing services over India and its neighbouring countries.

127. The Committee noted that SGAC, through its Youth for Global Navigation Satellite Systems group, had continued to support public education and outreach regarding the importance of GNSS systems, including updating its brochure on "GNSS and youth".

128. The Committee noted with appreciation that on 10 June 2013, on the margins of the tenth meeting of the Provider's Forum, the European Commission had donated a model of the Galileo navigation satellite system, provided by Astrium, to the permanent exhibit of the Office for Outer Space Affairs.

7. Space weather

129. The Committee took note of the discussion of the Subcommittee under the item on space weather, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 156-166).

130. The Committee noted that the agenda item allowed 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 science and research with a view to promoting greater international cooperation in that area.

131. The Committee noted with satisfaction the objectives of the item on space weather (A/AC.105/1038, para. 160).

132. The Committee 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.

133. The Committee 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.

134. The Committee noted that the activities which had begun under the International Heliophysical Year 2007 and had continued under the International Space Weather Initiative provided an understanding of the effects of the sun on the space infrastructure and the Earth's environment.

135. The Committee noted with satisfaction that a special workshop on space weather was planned to be held on the margins of the fifty-first session of the Scientific and Technical Subcommittee, in 2014.

136. The Committee noted that the International Space Weather Initiative and SCOSTEP had been organizing space science schools on solar terrestrial physics and space weather, beginning in 2007 with the International Heliophysical Year, and that the 2013 space science school would be held in Nairobi. This school was a continuation of the previous successful schools conducted in Ethiopia in 2010, Slovakia in 2011 and Indonesia in 2012.

137. The Committee also noted the National Space Weather Laboratory, an initiative set up by the National Space Agency of Malaysia (ANGKASA) and the Malaysian Meteorological Department, continued to monitor space weather and to issue notifications to various stakeholders and to the public.

8. Use of nuclear power sources in outer space

138. The Committee took note of the discussion of the Subcommittee under the item on the use of nuclear power sources in outer space, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 167-178).

139. The Committee endorsed the decisions and recommendations of the Subcommittee and the Working Group on the Use of Nuclear Power Sources in Outer Space, reconvened under the chairmanship of Sam A. Harbison (United Kingdom) (A/AC.105/1038, para. 178, and annex II, paras. 10 and 11).

140. The Committee noted with satisfaction the work of the Working Group on the Use of Nuclear Power Sources in Outer Space under its multi-year workplan.

141. 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.

142. Some delegations expressed the view that more consideration should be given to the use of nuclear power sources in terrestrial orbits in order to address the problem of potential collisions of nuclear power source objects in orbit, as well as to their accidental re-entry into the Earth's atmosphere. Those delegations were of the view that more attention should be given to that matter through adequate strategies, long-term planning, regulations and the promotion of binding standards, as well as the Safety Framework for Nuclear Power Source Applications in Outer Space.

9. Near-Earth objects

143. The Committee took note of the discussion of the Subcommittee under the item on near-Earth objects, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 179-198, and annex III).

144. The Committee endorsed the recommendations of the Subcommittee and its Working Group on Near-Earth Objects for an international response to the near-Earth object (NEO) impact threat (A/AC.105/1038, para. 198, and annex III).

145. The Committee noted with satisfaction that implementation of the recommendations would ensure increased awareness, coordination of protection and mitigation activities and further international collaboration with regard to NEOs.

146. The Committee noted that the Working Group on Near-Earth Objects had finalized its work in 2013 and expressed sincere gratitude to Sergio Camacho (Mexico) for the successful chairmanship of the Working Group.

147. The Committee noted that the Working Group on Near-Earth Objects had had before it the final report of the Action Team on Near-Earth Objects (A/AC.105/C.1/L.330) and the recommendations of the Action Team on Near-Earth Objects for an international response to the NEO impact threat (A/AC.105/C.1/L.329), which 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.

148. The Committee noted that the Action Team on Near-Earth Objects would continue its work to assist in the establishment of an international asteroid warning network and a space mission planning advisory group, in accordance with the recommendations of the Working Group on Near-Earth Objects (A/AC.105/1038, para. 198, and annex III).

149. The Committee noted with satisfaction that, on the margins of its fifty-sixth session, the third meeting of the representatives of space agencies had been held to discuss draft terms of reference for a space mission planning advisory group. In that regard, the Committee also noted that the Action Team should continue to inform the Subcommittee of the progress in the establishment of both groups, and that once established, the international asteroid warning network and the space mission planning advisory group should report on their work to the Subcommittee on an annual basis.

150. The Committee noted the importance of international collaboration and 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.

151. The Committee noted that the Action Team on Near Earth Objects, in collaboration with ESA, would organize the first official meeting of representatives of space agencies and relevant space bodies prior to the fifty-first session of the Scientific and Technical Subcommittee, in 2014. The Office for Outer Space Affairs would transmit an invitation to all member States of the Committee to designate a space agency or a relevant space body, as well as intergovernmental organizations with spacefaring capabilities, to participate in the first official meeting of the space mission planning advisory group.

10. Long-term sustainability of outer space activities

152. The Committee took note of the discussion of the Subcommittee under the item on the long-term sustainability of outer space activities, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 199-225).

153. The Committee endorsed the recommendations and decisions on the item made by the Subcommittee and the Working Group on the Long-term Sustainability of Outer Space Activities, reconvened under the chairmanship of Peter Martinez (South Africa) (A/AC.105/1038, para. 225, and annex IV, paras. 8 and 11).

154. The Committee had before it a note by the Secretariat presenting a compilation of the proposed draft guidelines of expert groups A to D of the Working Group on the Long-term Sustainability of Outer Space Activities, as at the fiftieth session of the Scientific and Technical Subcommittee, held in February 2013 (A/AC.105/1041), made available in accordance with the agreement reached by the Working Group during the fiftieth session of the Subcommittee (A/AC.105/1038, annex IV, para. 8); a working paper submitted by the Russian Federation entitled "Long-term sustainability of outer space activities" (A/AC.105/2013/CRP.13/Rev.1); a working paper submitted by the Russian

Federation entitled “Prerequisites for promoting the consideration of ways and means of maintaining outer space for peaceful purposes in the context of the issue of the long-term sustainability of outer space activities” (A/AC.105/2013/CRP.19); a conference room paper on the development of the report and guidelines of the Working Group on the Long-term Sustainability of Outer Space Activities (A/AC.105/2013/CRP.20), which included a draft outline for the report of the Working Group; and a conference room paper containing a list of points of contact for the Working Group and members of expert groups A through D (A/AC.105/2013/CRP.17).

155. The Committee welcomed the progress made under the agenda item within the Working Group and in the four expert groups and the timely distribution of the document containing the compilation of the proposed draft guidelines, which presented an important step forward in the preparation of a draft set of guidelines of the Working Group.

156. The Committee noted that the draft guidelines of each expert group were still under development and that the document containing the compilation of the proposed draft guidelines contained an account of the work done thus far and was produced for the purpose of assisting delegations in giving their considered views on the emerging guidelines and in guiding the expert groups and the Chair of the Working Group in drafting the report of the Group.

157. The Committee recalled that a joint meeting of the expert groups had been held on the margins of the fiftieth session of the Subcommittee, where the co-chairs of the expert groups had presented the current status of their work and highlighted overlaps in the emerging guidelines which would be addressed as the guidelines were consolidated into the final report of the Working Group.

158. The Committee recalled that, in accordance with the multi-year workplan (see A/66/20, annex II, para. 23), a workshop had been held in conjunction with the fiftieth session of the Scientific and Technical Subcommittee and that States members of the Committee had been invited to include in their delegations representatives of national non-governmental organizations and private sector entities having experience in space activities, so as to collect information on their experience and practices in the conduct of sustainable space activities.

159. The Committee noted that, in accordance with the agreement reached at its fifty-fifth session (A/67/20, para. 348), the Working Group had met during the current session of the Committee, benefiting from interpretation services.

160. The Committee noted that expert groups A to D of the Working Group had met on the margins of the current session of the Committee, in accordance with the terms of reference and methods of work of the Working Group, and as agreed by the Working Group at the fiftieth session of the Subcommittee (A/AC.105/1038, annex IV, para. 11).

161. The Committee also noted that the expert groups had held a joint meeting on 20 June 2013. During that meeting, the co-chairs of the expert groups and the Chair of the Working Group presented the progress that had been made during the current session and addressed questions relating to the preparation of the draft Working Group report.

162. The Committee noted that a revised version of document A/AC.105/1041, reflecting the progress made by expert groups A to D of the Working Group on their proposed draft guidelines during the fifty-sixth session of the Committee, would be made available in all official languages of the United Nations as soon as possible after the current session of the Committee.

163. The Committee noted that a working paper by the Chair of the Working Group, containing a proposal for a draft Working Group report and a preliminary set of draft guidelines, would be made available in all official languages of the United Nations for the fifty-first session of the Scientific and Technical Subcommittee and that during that session the Working Group would begin to work on its draft report.

164. Some delegations expressed the view that a special group should be set up to look into harmonizing the language and terminology used in all official languages of the United Nations in the draft Working Group report.

165. The Committee noted that the working reports of the expert groups of the Working Group would be made available in conference room papers during the fifty-first session of the Scientific and Technical Subcommittee, in 2014.

166. The Committee noted that expert groups A, B and D had decided to meet informally on the margins of the sixty-fourth International Astronautical Congress, to be held in Beijing from 23 to 27 September 2013.

167. The Committee agreed that the Chair of the Working Group would inform the Legal Subcommittee at its fifty-third session of the progress achieved by the Working Group in the period leading up to and during the fifty-first session of the Scientific and Technical Subcommittee.

168. Some delegations expressed the view that the guidelines should be clarified and made more concise, precise and specific, and that there should be a clear path for their implementation.

169. Some delegations expressed the view that the issues discussed within the Working Group and by the Group of Governmental Experts on Transparency and Confidence-building Measures in Outer Space Activities, and in relation to the discussions on a proposed international code of conduct for outer space activities, had shared goals of promoting stability, safety and security in the space environment. The delegations that expressed that view were also of the view that it was therefore useful for the Working Group to take into consideration progress made under the other initiatives.

170. The view was expressed that discussions on the long-term sustainability of outer space activities were also highlighting the contribution of space activities to sustainable development on Earth, and that developing countries should actively participate in the work of the Working Group.

171. The view was expressed that the Working Group and the expert groups should identify concrete near-term, medium-term and long-term goals to achieve the long-term sustainability of outer space activities.

172. The view was expressed that the complex technical, political and legal nature of the issues at hand necessitated the allotment of sufficient time for deliberations, so that the emerging guidelines could be clarified and made more concrete in order to facilitate their successful and effective implementation.

173. The view was expressed that achieving long-term sustainability of outer space activities necessitated the further advancement of international and regional cooperation, and that the recommendations and guidelines of the Working Group should not limit access to outer space by developing countries with emerging space capabilities.

174. The view was expressed that the focus of the guidelines should be shifted from the interests of the private sector to the interests of people, and that the Working Group should endeavour to go beyond the status quo in its efforts to promote the long-term sustainability of outer space activities.

175. Some delegations expressed the view that the use of nuclear power sources in outer space should also be considered with regard to implications for the safe and sustainable use of outer space, and that there should be interaction between the Working Group on the Long-term Sustainability of Outer Space Activities and the Working Group on the Use of Nuclear Power Sources in Outer Space.

11. 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

176. The Committee took note of the discussion of the Subcommittee under the item on the 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 reflected in the report of the Subcommittee (A/AC.105/1038, paras. 226-232).

177. Some delegations reiterated the view that the geostationary orbit was a limited natural resource at risk of becoming saturated, which threatened the sustainability of outer space activities. Those delegations were of the view that the exploitation of the geostationary orbit should, with the participation and cooperation of ITU, be rationalized and made available to all States, irrespective of their current technical capabilities, thus giving them the opportunity to have access to the geostationary orbit under equitable conditions, taking into account in particular the needs of developing countries and the geographical position of certain countries.

178. Some delegations were of the view that the geostationary orbit offered unique potential for the implementation of social programmes, educational projects and medical assistance. Those delegations therefore considered that the item on the geostationary orbit should remain on the agenda of the Subcommittee for further discussion through working groups, intergovernmental panels or task forces, for the purpose of continuing to analyse the scientific and technical characteristics of the orbit and in order to ensure the use of the geostationary orbit in accordance with international law.

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

179. The Committee took note of the discussion of the Subcommittee under the item on the draft provisional agenda for the fifty-first session of the Scientific and Technical Subcommittee, as reflected in the report of the Subcommittee (A/AC.105/1038, paras. 233-242).

180. The Committee endorsed the recommendations and decisions on the item made by the Subcommittee and its Working Group of the Whole (A/AC.105/1038, paras. 235, 237, 238 and 242, and annex I, paras. 3, 5 and 15).

181. On the basis of the deliberations of the Subcommittee at its fiftieth session, the Committee agreed that the following items should be considered by the Subcommittee at its fifty-first session:

1. Election of the Chair.
2. General exchange of views and introduction of reports submitted on national activities.
3. United Nations Programme on Space Applications.
4. Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda.
5. Matters relating to remote sensing of the Earth by satellite, including applications for developing countries and monitoring of the Earth's environment.
6. Space debris.
7. Space-system-based disaster management support.
8. Recent developments in global navigation satellite systems.
9. Space weather.
10. Near-Earth objects.
11. 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))
12. 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))
13. 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)

14. 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.

182. The Committee agreed that the Working Group of the Whole, the Working Group on the Use of Nuclear Power Sources in Outer Space and the Working Group on the Long-term Sustainability of Outer Space Activities should be reconvened at the fifty-first session of the Scientific and Technical Subcommittee.

183. The Committee agreed 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 global navigation satellite systems”.

C. Report of the Legal Subcommittee on its fifty-second session

184. The Committee took note with appreciation of the report of the Legal Subcommittee on its fifty-second session (A/AC.105/1045), which contained the results of its deliberations on the items considered by the Subcommittee in accordance with General Assembly resolution 67/113.

185. The Committee expressed its appreciation to Tare Charles Brisibe (Nigeria) for his able leadership during the fifty-second session of the Subcommittee.

186. The representatives of Algeria, Austria, Canada, China, the Czech Republic, France, Germany, Greece, Indonesia, Japan, the Russian Federation, Saudi Arabia, South Africa, the United States and Venezuela (Bolivarian Republic of) made statements under the item. A statement was also made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. The observer for Unidroit also made a statement under the item. During the general exchange of views, statements relating to the item were also made by other member States.

187. Under the item, the Committee heard a presentation entitled “The current status of the education and research on space law in China” by the representative of China.

1. Status and application of the five United Nations treaties on outer space

188. The Committee took note of the discussion of the Subcommittee under the item on the status and application of the five United Nations treaties on outer space, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 32-50).

189. The Committee endorsed the decisions and recommendations of the Subcommittee and its Working Group on the Status and Application of the Five United Nations Treaties on Outer Space, which had been reconvened under the

chairmanship of Jean-François Mayence (Belgium) (A/AC.105/1045, para. 34, and annex I, paras. 9, 10, 14 and 15).

190. The Committee noted with satisfaction that the Assembly of Parties of EUTELSAT-IGO, at its thirty-eighth meeting, held on 15 and 16 May 2013, noted that the majority of the member States of the organization were parties to the Convention on Registration of Objects Launched into Outer Space and to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and requested the Executive Secretary of EUTELSAT-IGO to make, on behalf of the organization, and in accordance with article VII of the Registration Convention, a declaration of acceptance of the rights and obligations provided for in that Convention.

191. Some delegations expressed the view that it was necessary to review, update and strengthen the five United Nations treaties on outer space with a view to invigorating the guiding principles that govern the space activities of States, strengthening international cooperation and making space technology available to all people. Those delegations were of the view that such reviewing and updating should not undermine the fundamental principles underlying the existing legal regime, but should enrich and further develop those principles.

192. Some delegations expressed the view that the United Nations treaties on outer space constituted a solid legal structure that was crucial for supporting the increasing scale of space activities and for strengthening international cooperation on the peaceful uses of outer space. Those delegations welcomed further adherence to the treaties and hoped that those States that had not yet ratified or acceded to the treaties would consider becoming parties to them.

193. Some delegations expressed the view that the legal regime governing activities in outer space should ensure that space research and space activities benefit the quality of life and well-being of people and the prosperity of current and future generations.

194. The view was expressed that a universal, comprehensive convention on outer space should be developed with the aim of finding solutions for existing issues, which would allow the international legal regime on outer space to be taken to the next level of its development.

195. Some delegations expressed the view that, given the rapid increase in space activities and the emergence of new space actors, more coordination and synergy between the two Subcommittees were needed in order to promote understanding, acceptance and application of the existing United Nations treaties and to strengthen the responsibility of States in carrying out space activities.

196. Some delegations expressed the view that the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies clearly established the interest of all States in the peaceful exploration and use of outer space, based on the concepts of equality and cooperation, and that discussions on the Moon Agreement should not be conducted from the viewpoint of commercial interests.

197. The view was expressed that international law regulating the conduct of space activities should not restrict access to space technologies for States, especially developing countries, wishing to develop their own space capacities in a sustainable manner.

2. Information on the activities of international intergovernmental and non-governmental organizations relating to space law

198. The Committee took note of the discussion of the Subcommittee under the item on information on the activities of international intergovernmental and non-governmental organizations relating to space law, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 51-59).

199. The Committee noted the important role of international intergovernmental and non-governmental organizations and their contribution to its endeavours to promote the development of space law and endorsed the recommendation of the Subcommittee that such organizations should again be invited to report to the Subcommittee at its fifty-third session on their activities relating to space law.

200. The Committee noted with appreciation that APSCO would host the Space Law and Policy Forum in Beijing from 26 to 28 June 2013.

201. The Committee noted that the Sofia Guidelines for a Model Law on National Space Legislation had been adopted by ILA at its seventy-fifth Conference, held from 26 to 30 August 2012.

3. Matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union

202. The Committee took note of the discussion of the Subcommittee under the agenda item on matters relating to the definition and delimitation of outer space and the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of ITU, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 60-80).

203. The Committee endorsed the recommendations of the Subcommittee and its Working Group on the Definition and Delimitation of Outer Space, reconvened under the chairmanship of José Monserrat Filho (Brazil) (A/AC.105/1045, paras. 62 and 63, and annex II, para. 8).

204. Some delegations expressed the view that scientific and technological progress, the commercialization of outer space, the participation of the private sector, emerging legal questions and the increasing use of outer space in general made it necessary for the Subcommittee to intensify its work on the question of the definition and delimitation of outer space.

205. The view was expressed that the development of territorial arrangements, space technology and space activities required clear definition in order to provide a basis for territorial sovereignty arrangements and that even a minimum consensus could facilitate progress in other related multilateral forums.

206. Some delegations expressed the view that the lack of a definition or delimitation of outer space created legal uncertainty concerning the applicability of space law and air law, and that matters concerning State sovereignty and the boundary between airspace and outer space needed to be clarified in order to reduce the possibility of disputes among States.

207. Some delegations expressed the view that the definition and delimitation of outer space was important in relation to the issue of the liability of States and other entities engaging in space activities. That issue had become particularly topical in the light of the current intensification and diversification of space activities.

208. Some delegations expressed the view that the geostationary orbit — a limited natural resource clearly in danger of saturation — must be used rationally and should be made available to all States, irrespective of their current technical capacities. That would give States the possibility of access to the orbit under equitable conditions, bearing in mind, in particular, the needs and interests of developing countries, as well as the geographical position of certain countries, and taking into account the processes of ITU and relevant norms and decisions of the United Nations.

209. Some delegations expressed the view that the geostationary orbit was part of outer space, that it was not subject to national appropriation by a claim of sovereignty, by means of use or occupation or by any other means, including by means of use or repeated use, and that its utilization was governed by the Outer Space Treaty, and the ITU Constitution, Convention and Radio Regulations.

210. The view was expressed that Member States should seek alternative ways of using the geostationary orbit that were more rational and balanced.

211. Some delegations expressed the view that the utilization by States of the geostationary orbit on the basis of “first come, first served” was unacceptable and that the Subcommittee should therefore develop a legal regime guaranteeing equitable access to orbital positions for States, in accordance with the principles of peaceful use and non-appropriation of outer space.

212. Some delegations expressed the view that, in order to ensure the sustainability of the geostationary orbit, it was necessary to keep that issue on the agenda of the Subcommittee and to explore it further, through the creation of appropriate working groups and intergovernmental panels, as necessary, with technical and legal expertise in order to promote equal access to the geostationary orbit.

4. National legislation relevant to the peaceful exploration and use of outer space

213. The Committee took note of the discussion of the Legal Subcommittee under the item on national legislation relevant to the peaceful exploration and use of outer space as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 81-93).

214. The Committee endorsed the recommendation of the Subcommittee that the set of recommendations on legislation relevant to the peaceful exploration and use of outer space, contained in annex III to the report of the Subcommittee, should be submitted as a separate draft resolution for consideration by the General Assembly at its sixty-eighth session.

215. The Committee noted with satisfaction that States continued to undertake efforts aimed at the development of national space-related regulatory frameworks, in accordance with the United Nations treaties on outer space.

216. The Committee agreed that the general exchange of information on national legislation relevant to the peaceful exploration and use of outer space provided States with a comprehensive overview of the current status of national space laws

and regulations and assisted States in understanding the different approaches taken at the national level with regard to the development of national space-related regulatory frameworks.

5. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space

217. The Committee took note of the discussion of the Subcommittee under the item on the review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 94-106).

218. The Committee endorsed the recommendation of the Subcommittee on the item (A/AC.105/1045, para. 106).

219. 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 regulatory activity associated with the use of nuclear power sources in outer space and that the matter concerned all of humanity. Those delegations were also 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 and not detrimental to humanity.

220. Some delegations stressed that more attention should be paid to the legal issues associated with the use of satellite platforms with nuclear power sources in Earth orbits, in the light of reported failures and collisions that posed a high risk to humanity.

221. Some delegations expressed the view that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to promote greater understanding, acceptance and implementation of the legal instruments and the development of new legal instruments related to the use of nuclear power sources in outer space.

222. Some delegations expressed the view that the Legal Subcommittee should undertake an amendment of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space with a view to developing binding standards.

223. Some delegations expressed the view that the Legal Subcommittee should undertake a review of the Safety Framework for Nuclear Power Source Applications in Outer Space and promote binding standards with a view to ensuring that any activity conducted in outer space was governed by the principles of preservation of life and maintenance of peace.

224. The view was expressed that further international and national efforts should be exerted to minimize risks of the use of satellite platforms with nuclear power sources in outer space, in particular in the geostationary orbit and low-Earth orbits, and to tackle legal problems related to collisions of such objects and other accidents and emergencies.

6. Examination and review of the developments concerning the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets

225. The Committee took note of the discussion of the Subcommittee under the item on the examination and review of the developments concerning the Protocol to the Convention on International Interests in Mobile Equipment on Matters Specific to Space Assets, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 107-114).

226. The Committee noted the efforts made by Unidroit to promote the early entry into force of the Protocol, which had been adopted in Berlin on 9 March 2012.

227. The Committee noted that the Protocol had been signed by Burkina Faso, Germany, Saudi Arabia and Zimbabwe and that, in order for it to enter into force, 10 ratifications, acceptances, approvals or accessions were needed, as well as certification by the supervisory authority confirming that the international registry for space assets was fully operational.

228. The Committee also noted that, pending the entry into force of the Protocol, a Preparatory Commission for the Establishment of the International Registry for Space Assets had been established to act with full authority as the provisional supervisory authority of the future international registry and that the Preparatory Commission operated under the guidance of the Unidroit General Assembly. In that regard, the Committee noted that the first session of the Preparatory Commission had been held at the headquarters of Unidroit in Rome on 6 and 7 May 2013 and that it had established two working groups, one tasked with drafting regulations for the future international registry for space assets and the other with drafting a request for proposals for the selection of the registrar of that registry.

229. The Committee further noted that the representatives of ITU had reported to the Preparatory Commission that, as a follow-up to the diplomatic Conference for the adoption of the draft protocol held in Berlin, the ITU Secretary-General continued to express interest in the possibility of ITU accepting the role of supervisory authority, subject to final approval by the ITU governing bodies, and had authorized the participation of ITU representatives in the work of the Preparatory Commission. In that regard, the Committee noted that the Preparatory Commission, at its session in May 2013, also agreed on a strict timetable for future work, with the aim of discussing a finalized version of the registry regulations by early 2014 at the latest, in time for the ITU Council session and Plenipotentiary Conference to be held in 2014.

7. Capacity-building in space law

230. The Committee took note of the discussion of the Subcommittee under the item on capacity-building in space law, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 115-133).

231. The Committee endorsed the recommendations of the Subcommittee on the agenda item (A/AC.105/1045, paras. 131 and 133).

232. The Committee agreed that research, training and education in space law were of paramount importance to national, regional and international efforts to further

develop space activities and to increase knowledge of the legal framework within which space activities were carried out.

233. The Committee noted that the exchange of views on national and international efforts to promote a wider appreciation of space law and endeavours such as the annual workshops on space law and the development of the curriculum on space law played a vital role in building capacity in space law.

234. The Committee noted with appreciation the holding of the eighth United Nations workshop on space law, on the theme “Contribution of space law to economic and social development”. The workshop, held in Buenos Aires from 5 to 8 November 2012, had been hosted by the Government of Argentina and organized jointly by the Office for Outer Space Affairs and the National Commission on Space Activities of Argentina, with the support of ESA.

235. The Committee noted that the Office for Outer Space Affairs planned to organize a session on space law on the margins of the fifth African Leadership Conference on Space Science and Technology for Sustainable Development, to be held in Ghana in 2013.

236. The Committee noted with satisfaction that the education curriculum on space law would be finalized in 2013 and that it would constitute a dynamic educational tool that could be easily used by educators from different professional backgrounds. The Committee welcomed the fact that the curriculum would also include a web-based compilation of reading materials, to be found on the website of the Office for Outer Space Affairs, which would be updated as new or additional materials were identified.

8. 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

237. The Committee took note of the discussion of the Legal Subcommittee under the item on the 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, as reflected in the report of the Legal Subcommittee (A/AC.105/1045, paras. 134-160).

238. The Committee expressed concern over the increasing amount of space debris and noted with satisfaction that the endorsement by the General Assembly, in its resolution 62/217, of the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space² was a key step in providing all spacefaring nations with guidance on how to mitigate the problem of space debris, and encouraged Member States to consider voluntary implementation of the Guidelines.

239. The Committee noted with satisfaction that some States had taken measures to enforce the implementation of internationally recognized guidelines and standards relating to space debris through relevant provisions in their national legislation.

² *Official Records of the General Assembly, Sixty-second Session, Supplement No. 20 (A/62/20), paras. 117 and 118 and annex.*

240. Some delegations expressed the view that the Legal Subcommittee should develop legal mechanisms to deal with the issue of space debris and consequences arising from collisions with space debris or their re-entry into the atmosphere.

241. Some delegations expressed the view that the Legal Subcommittee should address legal implications and concerns of space debris removal.

242. Some delegations expressed the view that there should be greater coordination and interaction between the Scientific and Technical Subcommittee and the Legal Subcommittee in order to promote greater understanding, acceptance and implementation of the legal instruments — and the development of new legal instruments — relating to the issue of space debris.

243. Some delegations expressed the view that the Space Debris Mitigation Guidelines of the Committee should be given a higher legal status, which might help to reinforce the regulatory framework at the global level.

244. The view was expressed that a document compiling national practices and legislation relating to space debris mitigation guidelines and instruments adopted by Member States and regional organizations would encourage the development of new national measures and practices.

9. Review of international mechanisms for cooperation in the peaceful exploration and use of outer space

245. The Committee noted the discussion of the Legal Subcommittee under the item on the review of international mechanisms for cooperation in the peaceful exploration and use of outer space, in accordance with its five-year workplan, and that in 2013 the Subcommittee had conducted an exchange of information on the range of existing international space cooperation mechanisms, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 161-174).

246. The Committee endorsed the decisions of the Subcommittee as contained in its report (A/AC.105/1045, paras. 163 and 174).

247. The Committee noted with appreciation that the Subcommittee had elected Setsuko Aoki of Japan as Chair of the Working Group on the Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space, to be convened in 2014.

248. The Committee noted with satisfaction that the exchange of information under the new agenda item on a broad range of international cooperative mechanisms employed by member States with a view to identifying common principles and procedures was of important significance to member States as they considered relevant mechanisms to facilitate future cooperation in the exploration and peaceful uses of outer space.

249. The Committee noted that the review of the mechanisms for cooperation in space activities would contribute to the further strengthening of international cooperation in the exploration and peaceful uses of outer space. In that regard, the Committee also noted that 2017, the final year of consideration of the agenda item, according to its workplan, would coincide with the fiftieth anniversary of the Outer Space Treaty.

10. Draft provisional agenda for the fifty-third session of the Legal Subcommittee

250. The Committee took note of the discussion of the Subcommittee under the item on the draft provisional agenda for the fifty-third session of the Legal Subcommittee, as reflected in the report of the Subcommittee (A/AC.105/1045, paras. 177-194).

251. The Committee agreed to include “General exchange of information on non-legally binding United Nations instruments on outer space”, proposed by Japan and supported by Austria, Canada, France, Nigeria and the United States, as contained in document A/AC.105/L.288, as an item to be considered on the agenda of the Legal Subcommittee.

252. On the basis of its deliberations and the deliberations of the Legal Subcommittee at its fifty-second session, the Committee agreed that the following items should be considered by the Subcommittee at its fifty-third session:

Regular items

1. Election of the Chair.
2. General exchange of views.
3. Information on the activities of international intergovernmental and non-governmental organizations relating to space law.
4. Status and application of the five United Nations treaties on outer space.
5. Matters relating to:
 - (a) The definition and delimitation of outer space;
 - (b) The character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union.
6. National legislation relevant to the peaceful exploration and use of outer space.
7. Capacity-building in space law.

Single issues/items for discussion

8. Review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space.
9. 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.
10. General exchange of information on non-legally binding United Nations instruments on outer space.

Items considered under workplans

11. Review of international mechanisms for cooperation in the peaceful exploration and use of outer space.

(Work for 2014 as reflected in the multi-year workplan contained in the report of the Legal Subcommittee on its fifty-first session (A/AC.105/1003, para. 179))

New items

12. Proposals to the Committee on the Peaceful Uses of Outer Space for new items to be considered by the Legal Subcommittee at its fifty-fourth session.

253. The Committee agreed that the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space and the Working Group on Matters Relating to the Definition and Delimitation of Outer Space should be reconvened at the fifty-third session of the Legal Subcommittee, and that the Working Group on the Review of International Mechanisms for Cooperation in the Peaceful Exploration and Use of Outer Space would be convened to begin its work at that session.

254. The Committee also agreed that the Subcommittee should review, at its fifty-third session, the need to extend beyond that session the mandate of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space.

255. The Committee agreed that IISL and the European Centre for Space Law should be invited to organize a symposium on space law at the fifty-third session of the Subcommittee.

256. The view was expressed that a revision of the agenda of the Subcommittee could help to make the work of the Subcommittee more structured and efficient and could encompass a reduced number of items that would incorporate the substance of all existing items on the agenda of the Subcommittee. A division of the sessions of the Subcommittee into two parts could be undertaken, with one week being dedicated to expert group discussions of topics chosen during the previous session and the second week being reserved for the exchange of views between government representatives.

257. Some delegations expressed the view that the current two-week period allotted for the work of the Legal Subcommittee should be maintained in order to ensure that issues arising in the future in relation to the legal framework of space activities were given adequate attention. A further reason for maintaining that duration was that the Subcommittee continued to have before it matters that required due consideration from a legal point of view.

D. Space and sustainable development

258. The Committee considered the agenda item entitled "Space and sustainable development", in accordance with General Assembly resolution 67/113.

259. The representatives of Algeria, Argentina, Austria, Canada, Chile, Ecuador, Egypt, France, Germany, India, Italy, Japan, Malaysia, Mexico, Nigeria, Portugal, the Republic of Korea, Switzerland, the United States and Venezuela (Bolivarian

Republic of) made statements under the item. Representatives of other member States made statements relating to the item during the general exchange of views.

260. The Committee had before it the following:

(a) Discussion paper submitted by Japan entitled “Draft proposed workplan for a mechanism of cooperative deliberation for space and sustainable development: bridging the Committee on the Peaceful Uses of Outer Space and the Scientific and Technical Subcommittee” (A/AC.105/2013/CRP.8);

(b) Conference room paper entitled “Rio+20 and beyond” (A/AC.105/2013/CRP.7).

261. The Committee heard the following presentations:

(a) “Japanese proposal on space and sustainable development”, by the representative of Japan;

(b) “Benefits of space technologies in Burkina Faso: the case of urban planning”, by the representative of Burkina Faso;

(c) “Spatial information to support Burkina Faso’s integral municipalization in the climate change context”, by the representative of Burkina Faso.

262. The Committee welcomed paragraph 274 in the outcome document of the United Nations Conference on Sustainable Development, entitled “The future we want”, in which 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.

263. The Committee noted the value of space technology and applications and space-derived data and information in contributing to sustainable development, including in the areas of land and water management, marine and coastal ecosystems, health care, climate change, disaster risk reduction and emergency response, navigation, seismic monitoring, natural resources management, biodiversity, agriculture and food security.

264. The Committee agreed to include the consideration of marine and coastal ecosystems as a special theme for discussion under the agenda item.

265. The Committee noted with satisfaction that a side event of the United Nations Conference on Sustainable Development, entitled “Space for sustainable development”, had been organized by the Office for Outer Space Affairs with the support of the Governments of Austria and Brazil on 19 June 2012 to discuss the contribution of space-based information and technologies to support the implementation of Conference outcomes and actions.

266. The Committee welcomed the conference room paper entitled “Rio+20 and beyond” (A/AC.105/2013/CRP.7), which provided an overview of the process for implementing the outcome of the United Nations Conference on Sustainable Development at the intergovernmental level and outlined the mechanisms for consideration of the post-2015 development agenda.

267. The Committee encouraged member States 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 the use of space-derived geospatial data.

268. The Committee noted that progress towards the achievement of sustainable development goals needed to be assessed and accompanied by targets and indicators, while taking into account different national circumstances, capacities and levels of development, and encouraged the Office for Outer Space Affairs to cooperate with the United Nations regional economic commissions in promoting the use of global, integrated and scientifically based information for sustainable development.

269. The Committee 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 promote the inclusion of space-related references and elements in the documentation generated by the United Nations Secretariat under those processes.

270. The Committee noted the discussion paper submitted by Japan (A/AC.105/2013/CRP.8) containing a draft proposed workplan for a mechanism for cooperative deliberation on space and sustainable development involving the Committee and the Scientific and Technical Subcommittee, and further noted that a revised draft proposed workplan would be submitted by Japan to the Subcommittee for consideration at its fifty-first session, in 2014.

271. Some delegations expressed the view that the discussion paper submitted by Japan could serve as a basis for closer interaction between the Committee and the Subcommittee in discussion of the agenda item of the Subcommittee on "Space technology for socioeconomic development in the context of the United Nations Conference on Sustainable Development and the post-2015 development agenda" and the agenda item of the Committee on "Space and sustainable development".

272. The Committee requested the Secretariat to establish a web page dedicated to the theme "space and sustainable development", which would contain documents relating to the use of space technology for sustainable development.

273. The Committee requested the Office for Outer Space Affairs to consider organizing a workshop on space technology for sustainable development in mountainous regions of the Andean countries, to be held in Quito in 2014.

274. The view was expressed that the Committee should make full use of existing tools, including those developed in the framework of the Group on Earth Observations and the Committee on Earth Observation Satellites, and avoid the establishment of redundant mechanisms.

275. The Committee noted the information provided by States on their actions and programmes aimed at increasing awareness and understanding in society of the applications of space science and technology for meeting development needs.

276. The Committee noted the continued role played by the International Space Station in education and outreach to educational communities worldwide.

277. The Committee noted with satisfaction the large number of outreach activities carried out at the regional level for building capacity through education and training

in using space science and technology applications for sustainable development. The Committee noted with appreciation the role played by the regional centres for space science and technology education, affiliated to the United Nations, in space-related education.

278. The Committee took note of a number of space-related conferences, competitions, exhibitions, symposiums and seminars worldwide connecting educators and students and providing them with training and educational opportunities.

E. Spin-off benefits of space technology: review of current status

279. The Committee considered the agenda item entitled “Spin-off benefits of space technology: review of current status”, in accordance with General Assembly resolution 67/113.

280. The representatives of Japan, Mexico, the Russian Federation and the United States made statements under the item.

281. The Committee heard the following presentations:

(a) “Technology transfer and space business start-up in Italy”, by the representative of Italy;

(b) “Space activities of Saudi Arabia”, by the representative of Saudi Arabia;

(c) “The network for space science and technology development of the National Council of Science and Technology (CONACYT)”, by the representative of Mexico.

282. The Committee took note of the information provided by States on their national practices regarding spin-offs of space technology that had resulted in the introduction of strategies for the management of regional economic development, as well as useful innovations in numerous scientific and practical areas of civil society, such as medicine, biology, chemistry, astronomy, agriculture, geology, cartography, aviation, land and marine transport, land use planning for urban and rural development, robotics, firefighting, the development of data processing hardware and software, mining, the protection of nature and the production and transportation of energy.

283. The Committee agreed that spin-offs of space technology constituted a powerful engine for technological innovation and growth in both the industrial and service sectors and that they could be beneficially applied to achieve social and economic objectives and the development of national communications infrastructure, as well as be applied in projects aimed at achieving sustainable development.

284. The Committee agreed that spin-offs of space technology should be promoted because they fostered innovative technologies, thus advancing economies and contributing to the improvement of the quality of life.

285. The Committee noted that Governments had successfully involved the private sector and academia in various projects in the area of spin-offs of space technology.

286. The publication *Spinoff 2012*, submitted by the National Aeronautics and Space Administration of the United States, was made available to the Committee.

F. Space and water

287. The Committee considered the agenda item entitled “Space and water”, in accordance with General Assembly resolution 67/113.

288. The representatives of Algeria, Brazil, Egypt, France, India, Indonesia, Japan, Malaysia, Switzerland and the United States made statements under the item. 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 also made by other member States.

289. In the course of the discussion, delegations reviewed national and cooperative water-related activities, giving examples of national programmes and bilateral, regional and international cooperation.

290. The Committee noted that water-related issues were becoming some of the most critical environmental problems facing humankind, often entailing political implications, and that conservation and proper utilization of existing water resources were of paramount importance for sustaining life on Earth. In that connection, space-derived data could support policymakers in making informed decisions on water resources management.

291. The Committee noted with satisfaction that the General Assembly, in its resolution 65/154, had decided to declare 2013 the International Year of Water Cooperation, which reflected the growing awareness of and concern regarding water-related issues.

292. The Committee noted the large number of space-borne platforms that addressed water-related issues and that space-derived data were used extensively in water management. The Committee also noted that space technology and applications, combined with non-space technologies, played an important role in addressing most water-related issues, including understanding and observation of global water cycles and unusual climate patterns, mapping of water courses, monitoring and mitigation of the effects of floods, droughts and earthquakes and improvement of the timeliness and accuracy of forecasts.

293. The Committee noted with satisfaction the successful completion of the United Nations/Pakistan Workshop on Integrated Use of Space Technology for Food and Water Security, held in Islamabad from 11 to 15 March 2013, and noted that the Workshop had provided a valuable platform for scientists, researchers and subject experts from around the world to share experiences on agricultural and water issues in different regions of the world.

294. The Committee also noted with satisfaction the successful completion of the Workshop on Remote Sensing in the Context of Floods, held in Santo Domingo from 13 to 17 May 2013. The programme was organized by UN-SPIDER in cooperation with the National Emergency Commission of the Dominican Republic and provided a valuable capacity-building opportunity for experts in the region on the prevention and mitigation of disasters and effective responses thereto.

295. The Committee noted that the Asian Water Cycle Initiative was developing an information system of systems to promote the implementation of integrated water resources management through data integration and sharing as a basis for appropriate decision-making with regard to national water policies in 20 Asian countries, and that the experiences acquired from the Initiative would also be useful in the implementation of the African Water Cycle Coordination Initiative.

296. The Committee noted the activities of the Antares regional network for water management, created to study the long-term changes in coastal ecosystems in sites around Latin America, distinguishing changes caused by natural variability from those caused by external perturbations (anthropogenic effects).

297. The Committee noted with satisfaction the plans to hold the third International Conference on the Use of Space Technology for Water Management, which would be jointly organized in Rabat in 2014 by the Office for Outer Space Affairs, the Government of Morocco, PSIPW and ISNET.

G. Space and climate change

298. The Committee considered the agenda item entitled “Space and climate change”, in accordance with General Assembly resolution 67/113.

299. The representatives of Brazil, Egypt, France, Germany, India, Italy, Japan, Malaysia, Mexico, Pakistan, the Republic of Korea, the Russian Federation, Saudi Arabia, Switzerland and the United States made statements under the item. 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 also made by representatives of other member States.

300. The Committee heard the following presentations under the item:

(a) “Methane Remote Sensing Lidar Mission (MERLIN)”, by the representatives of France and Germany;

(b) “Health checkup of the Earth from space: Shizuku application”, by the representative of Japan;

(c) “Variability of the Sun and its Terrestrial Impact (VarSITI) programme”, by the observer for SCOSTEP.

301. The Committee noted that climate change was considered one of the greatest challenges of the present time and, as reflected in the outcome document of the United Nations Conference on Sustainable Development, a cross-cutting issue that was adversely affecting all regions of the world through a variety of processes such as global warming, reduction in sea ice coverage and ice masses, sea-level rise, changes in large-scale current systems in oceans, unstable weather conditions and more intense or extreme weather events such as storms, tropical cyclones, floods and droughts.

302. The Committee noted that satellite observations and space-derived data were indispensable tools to track climate change in its various manifestations and that, together with ground-based observations, these provided an integrated perspective

on the changing environment of the Earth and an understanding of the implications of global climate change for humankind. In that regard, the Committee noted that satellite data were also crucial in the development of international assessments, such as climate assessment by the Intergovernmental Panel on Climate Change and ozone assessment by the World Meteorological Organization (WMO).

303. The Committee noted the urgency of targeting climate change and the importance of international collaboration in providing ground-based and in situ observations to complement, validate and enhance satellite data. In that regard, the Committee also noted that open access to reliable space-based Earth observation data would strengthen global efforts to combat and mitigate the impacts of climate change and adapt to its effects.

304. The Committee noted that several member States had launched or planned to launch Earth observation satellites to track the manifestations and effects of climate change. The Committee also noted a number of cooperative efforts between the space agencies of several countries to launch satellites to monitor the impact of climate change and parameters related to it.

305. The Committee noted that the Conference of the Parties serving as the meeting of the Parties to the Kyoto Protocol, at its eighth session, held in Doha from 26 November to 8 December 2012, adopted decision 1/CMP.8, entitled “Amendment to the Kyoto Protocol pursuant to its article 3, paragraph 9 (the Doha Amendment)”,³ which included new commitments for Annex I parties to the Kyoto Protocol to the United Nations Framework Convention on Climate Change,⁴ who agreed to take on commitments during a second commitment period from 1 January 2013 to 31 December 2020.

306. The Committee noted that the ministerial meeting of the Arctic Council, held on 15 May 2013 in Kiruna, Sweden, in its declaration entitled “Vision for the Arctic”, recognized the uniqueness and fragility of the Arctic environment. The Committee also noted that non-Arctic States, including China, India, Italy, Japan, the Republic of Korea and Singapore, had acquired the status of observer States in the Arctic Council, to help provide expertise regarding the particularly challenging effects of climate change in polar regions.

307. Some delegations described their efforts to support activities related to climate change conducted by the Group on Earth Observations, the Committee on Earth Observation Satellites, the Global Earth Observation System of Systems, the Global Climate Observing System and the Coordination Group for Meteorological Satellites, and to contribute to the global climate change mitigation and adaptation actions under the United Nations Framework Convention on Climate Change.

308. Some delegations expressed the view that it was necessary to support efforts conducted by WMO, including the Architecture for Climate Monitoring from Space and the Global Framework for Climate Services.

309. Some delegations described their efforts in using satellites as an indispensable tool for monitoring emissions of greenhouse gases and aerosols and several other

³ See FCCC/KP/CMP/2012/13/Add.1.

⁴ United Nations, *Treaty Series*, vol. 2303, No. 30822.

essential climate variables, as well as the melting of glaciers, sea ice in the polar caps and the Greenland ice sheet, land-cover changes and sea-level rise.

310. Some delegations expressed the view that climate change had been provoking desertification, triggering disasters and exerting an impact on marine ecosystems and marine life, and that the effects of climate change extended to virtually all aspects of sustainable development.

311. The view was expressed that the scale and gravity of the negative impacts of climate change undermined the ability of all countries, and in particular the developing countries, to achieve sustainable development and the Millennium Development Goals, and that combating climate change required immediate action, in accordance with the provisions of the United Nations Framework Convention on Climate Change.

H. Use of space technology in the United Nations system

312. The Committee considered the agenda item entitled “Use of space technology in the United Nations system”, in accordance with General Assembly resolution 67/113.

313. The representatives of Japan, the Russian Federation and Switzerland made statements under the item. The observer for ESCAP also made a statement. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

314. The Director of the Office for Outer Space Affairs made a statement informing the Committee about the outcomes of the thirty-third session of the Inter-Agency Meeting on Outer Space Activities, hosted by the United Nations Office for Disaster Risk Reduction in Geneva from 12 to 14 March 2013. The Committee had before it the report of the Inter-Agency Meeting on that session (A/AC.105/1043).

315. The Committee welcomed with appreciation the special report of the Inter-Agency Meeting on Outer Space Activities on the use of space technology within the United Nations system for agricultural development and food security (A/AC.105/1042). The Committee recalled that previous special reports of the Inter-Agency Meeting included the note by the Secretariat entitled “Space benefits for Africa: contribution of the United Nations system” (A/AC.105/941), prepared in cooperation with the Economic Commission for Africa and in consultation with members of the Inter-Agency Meeting; and the special report of the Inter-Agency Meeting on the use of space technology within the United Nations system to address climate change issues (A/AC.105/991).

316. The Committee welcomed the agreement of the Inter-Agency Meeting that the report of the Secretary-General on the coordination of space-related activities within the United Nations system for the period 2014-2015, to be prepared in 2014, should address the post-2015 development agenda, giving attention to the issue of resilience and building on the previous reports of the Secretary-General.

317. The Committee agreed that the use of the abbreviation “UN-Space” would increase the visibility of the Inter-Agency Meeting and further strengthen the role of the inter-agency mechanism.

318. The Committee noted with satisfaction that the tenth open informal session of the Inter-Agency Meeting on Outer Space Activities had been organized by the Office for Outer Space Affairs and the United Nations Office for Disaster Risk Reduction on 12 March 2013 in Geneva, focusing on the theme “Space and disaster risk reduction: planning for resilient human settlements” (see A/AC.105/2013/CRP.9). The Committee noted the timeliness of the open informal session in view of the overall importance of the concept of resilience, and encouraged member States to continue to participate actively in the open informal sessions of the Inter-Agency Meeting.

319. The Committee noted the cooperative efforts between member States and United Nations entities to promote the use of space technology to resolve global issues faced by humanity. In that connection, the Committee took note of the Asia-Pacific Plan of Action for Applications of Space Technology and Geographic Information Systems for Disaster Risk Reduction and Sustainable Development, 2012-2017, adopted by ESCAP at its sixty-ninth session.

320. The Committee noted that the thirty-fourth session of the Inter-Agency Meeting should be held in March 2014, in conjunction with a meeting of the United Nations Geographic Information Working Group, in view of the synergies between the two inter-agency coordination mechanisms. The Committee noted that the Office for Outer Space Affairs, in its function as the secretariat of the Inter-Agency Meeting, would identify, in consultation with the co-chairs of the Working Group, the host of the thirty-fourth session of the Meeting.

321. Some delegations expressed the view that the Committee should cooperate with WMO and ICAO in the harmonization of procedures and formats for communicating information on space weather to air carriers and passengers.

I. Future role of the Committee

322. The Committee considered the agenda item entitled “Future role of the Committee”, in accordance with General Assembly resolution 67/113.

323. The Committee recalled its agreement at its fifty-fifth session to continue its consideration of the item at its fifty-sixth session, in 2013, for one year only.

324. The representatives of Chile, China, Iran (Islamic Republic of), Japan and Mexico made statements under the item. During the general exchange of views, statements relating to the item were also made by representatives of other member States. The observer for ITU also made a statement under the item.

325. The Committee took note with appreciation of the discussion paper entitled “Next phase in global governance for space research and utilization” (A/AC.105/2013/CRP.10), which was submitted by the current Chair of the Committee and presented a revised and updated version of the paper submitted by the Chair of the Committee in 2012 (A/AC.105/2012/CRP.4).

326. The Chair of the Committee made a statement presenting the main elements in his paper and highlighted the aim of stimulating thought and promoting an open dialogue on various cross-cutting issues before the Committee. In that sense, the Chair pointed out three main pillars, namely, to strengthen the role of the

Committee and its Subcommittees as a unique platform at the global level for international cooperation in space science and technology and long-term space utilization for the peaceful use of outer space; to promote greater dialogue between the Committee and regional and interregional cooperation mechanisms in space activities, in particular for sustainable development; and to stimulate the further advancement of space science and technology and their applications for the benefit of all humankind.

327. The Committee noted that many issues related to its future role had already been addressed under other agenda items and would therefore be reflected in other parts of the present report.

328. Some delegations expressed the view that the Committee and its Scientific and Technical Subcommittee and Legal Subcommittee indeed constituted a unique common platform for promoting international cooperation in the peaceful uses of outer space at the global level, and therefore interaction between the three bodies on the cross-cutting issues before them should be intensified.

329. Some delegations expressed the view that it was important for the Committee and its Subcommittees to strengthen the setting of binding norms for space activities, in particular in view of the increasing presence of new actors in the space field, including private sector involvement.

330. Some delegations expressed the view that the Committee and its Subcommittees should be more active in promoting the implementation of the five United Nations treaties on outer space and facilitating consensus on concepts and specific needs relating to outer space that lacked unified agreement, so as to further improve the legal regime governing new activities in outer space, including for the protection of the space environment, and be more practical in promoting international cooperation in space activities.

331. The view was expressed that the global processes of implementing the outcome of the United Nations Conference on Sustainable Development and preparing for the post-2015 development agenda needed the participation of all stakeholders in the space field and, in that context, the Committee and its Subcommittees had a responsibility to advance their common role in overall governance of space activities at the international level.

332. The view was expressed that in light of valuable achievements since the establishment of the Committee more than 50 years ago, the time had now come to enhance the future role of the Committee, by forming a dedicated working group to assess organizational requirements to suit its future vision and mission.

333. The Committee agreed to continue its consideration of the item at its fifty-seventh session, in 2014, for one year only.

J. Other matters

334. The Committee considered the agenda item entitled "Other matters", in accordance with General Assembly resolution 67/113.

335. The representatives of Chile, France, Saudi Arabia and Venezuela (Bolivarian Republic of) made statements under the item. During the general exchange of views,

statements relating to the item were also made by representatives of other member States. The observers for Belarus and Ghana made statements. A statement was also made by the observer for ISNET.

1. Composition of the bureaux of the Committee and its subsidiary bodies for the period 2014-2015

336. In accordance with General Assembly resolution 67/113 and pursuant to the measures relating to the working methods of the Committee and its subsidiary bodies,⁵ as endorsed by the General Assembly in its resolution 52/56, the Committee considered the composition of the bureaux of the Committee and its subsidiary bodies for the period 2014-2015.

337. The Committee noted the nominations by the African States, the Eastern European States and the Western European and other States of their candidates for the offices of Chair of the Committee, Chair of the Scientific and Technical Subcommittee and Chair of the Legal Subcommittee, respectively (A/67/20, paras. 328, 330 and 331).

338. The Committee also noted that the Latin American and Caribbean States had decided that Ecuador would nominate its representative for the office of First Vice-Chair of the Committee for the period 2014-2015 (A/67/20, para. 329). In that regard, the Committee asked Ecuador to nominate its representative for that office before the sixty-eighth session of the General Assembly.

339. The Committee noted that the Asian States would nominate their candidate for the office of Second Vice-Chair/Rapporteur of the Committee before the sixty-eighth session of the General Assembly.

2. Membership of the Committee

340. The Committee welcomed the application of Belarus for membership in the Committee (A/AC.105/2013/CRP.4) and decided to recommend to the General Assembly at its sixty-eighth session, in 2013, that Belarus should become a member of the Committee.

341. The Committee welcomed the application of Ghana for membership in the Committee (A/AC.105/2013/CRP.3) and decided to recommend to the General Assembly at its sixty-eighth session, in 2013, that Ghana should become a member of the Committee.

342. The Committee encouraged States that were considering to apply for membership in the Committee, as well as member States of the Committee, to consider the possibility of acceding to the five United Nations treaties on outer space, or at least some of them, if they had not done so.

⁵ *Official Records of the General Assembly, Fifty-second Session, Supplement No. 20 (A/52/20), annex I*; see also *Official Records of the General Assembly, Fifty-eighth Session, Supplement No. 20 (A/58/20), annex II, appendix III*.

3. Observer status

343. The Committee took note of the application of ISNET for permanent observer status with the Committee. The application and the relevant correspondence were before the Committee in conference room paper A/AC.105/2013/CRP.5.

344. The Committee decided to recommend that the General Assembly, at its sixty-eighth session, grant to ISNET the status of permanent observer with the Committee.

345. The Committee requested the Secretariat to present to it, on an annual basis, information on the consultative status with the Economic and Social Council of non-governmental organizations having permanent observer status with the Committee.

4. Organizational matters

346. The Committee recalled its agreement made at its fifty-fourth session, in 2011, on certain methods to enhance the organization of work of its sessions and the sessions of the Scientific and Technical Subcommittee and Legal Subcommittee,⁶ and noted with satisfaction that those measures were already being applied successfully in the sessions of the Subcommittees and the Committee. In that regard, the Committee stressed the need for maximum flexibility in the scheduling of agenda items in order to optimize the balance between the consideration of agenda items in plenary meetings and work conducted in working groups.

347. The Committee had before it a proposal by Greece on matters relating to the membership of the Committee, the composition of the bureaux and the duration of sessions of the Committee and its Subcommittees (A/AC.105/2013/CRP.22).

348. Some delegations expressed the view that the organization and methods of work of the Committee and its Subcommittees were a key element in strengthening the functioning and role of those bodies and invited delegations to engage constructively in consultations on proposals to make the work of those bodies more efficient and result oriented.

349. The view was expressed that member States should pay attention to the timely submission of documents to the Secretariat, in order to ensure their translation into the six official languages of the United Nations in time for the sessions of the Committee and its Subcommittees.

350. The view was expressed that all conference room papers should, if possible, be translated into the six official languages of the United Nations.

351. The view was expressed that, in the scheduling of the meetings, precedence should be given to substantive discussions on agenda items in plenary and in working groups, as well as other important matters, instead of technical presentations, in order to make the most efficient use of the interpretation services, and that an assessment should be made regarding the contribution of technical presentations to the work done in the Committee.

⁶ Ibid., *Sixty-sixth Session, Supplement No. 20* (A/66/20), para. 298.

5. Draft provisional agenda for the fifty-seventh session of the Committee

352. The Committee recommended that the following items be considered at its fifty-seventh session, in 2014:

1. Election of officers.
2. General exchange of views.
3. Ways and means of maintaining outer space for peaceful purposes.
4. Report of the Scientific and Technical Subcommittee on its fifty-first session.
5. Report of the Legal Subcommittee on its fifty-third session.
6. Space and sustainable development.
7. Spin-off benefits of space technology: review of current status.
8. Space and water.
9. Space and climate change.
10. Use of space technology in the United Nations system.
11. Future role of the Committee.
12. Other matters.

K. Schedule of work of the Committee and its subsidiary bodies

353. The Committee agreed on the following tentative timetable for its session and those of its Subcommittees in 2014:

	<i>Date</i>	<i>Location</i>
Scientific and Technical Subcommittee	10-21 February 2014	Vienna
Legal Subcommittee	24 March-4 April 2014	Vienna
Committee on the Peaceful Uses of Outer Space	11-20 June 2014	Vienna



Swedish Civil
Contingencies
Agency

Stockholm, 5-6 September 2012

Conference proceedings

**International round-table on Extreme space weather:
Geomagnetic storms, GNSS disruptions and the impact
on vital functions in society**



Stockholm, 5-6 September 2012

Conference proceedings

International round-table on Extreme
space weather: Geomagnetic storms,
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Swedish Civil Contingencies Agency (MSB)

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Introduction

Over the past few years there has been a surge of interest in studying the impact from extreme space weather and a number of countries are currently reviewing their planning and preparedness to cope with these risks as part of their national risk assessments. However, despite a rising interest from policymakers, media and also from elected officials, there is still a general tendency to view the risks from space weather as “far-out” – both literally and figuratively.

This is a challenge for all of us who are convinced that the risks from extreme space weather are real and deserve more attention. Extreme solar storms or geomagnetic storms belong to the category of risks that are often called HILP (High Impact Low Probability). Such risks are usually harder to argue for than the ones with less impact and higher probability.

It is also an example of a truly transboundary risk which is very difficult to “box in” within a specific sector. The “ownership” is unclear and the management of impact requires a cross-fertilization of many different communities: space scientists, forecasters, engineers, emergency managers, public and private operators of critical infrastructure etc. These factors may provide some explanation to the relative lack of awareness and concerted international action.

I was myself somewhat amazed the first time I heard one of “the believers” explain why the risks from extreme space weather had to be taken seriously. That was in summer of 2009, when I had the privilege of meeting with the Administrator of FEMA, Mr Craig Fugate, in his office in Washington. We were supposed to discuss community resilience but we ended up having a discussion on geomagnetic storms and solar flares – and after that I was also part of the “community of believers”.

That fascinating meeting paved the way for the Euroatlantic workshop on extreme space weather that FEMA and MSB organized together in Boulder, Colorado, in February 2010, “Managing Critical Disasters in the Transatlantic domain – The Case of a Geomagnetic Storm”. Colleagues from the European Commission

participated in the event and the Space Weather Prediction Center (SWPC) at NOAA hosted the meeting.

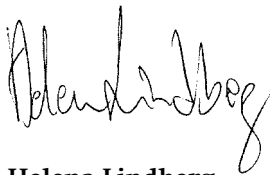
Since then good work has continued also at the European level. Last October, the European Commission organized a Space Weather Awareness Dialogue (SWAD), gathering a select number of experts. The general conclusion from this stock taking event was the need for continued international cooperation to increase knowledge, establish relevant networks and build resilience across national borders. More focused workshops on specific topics were called for to help advance this cause.

I am very happy that this roundtable in Stockholm has been able to add to the important discussions that started in Boulder two years ago and continued at the SWAD last year. The outcome of the Stockholm Roundtable is essentially a result of synergies between the many excellent presentations and interventions that were made by the participants. I was very pleased to be able to welcome such a large group of distinguished contributors from the US (FEMA, NOAA) and the European Commission (JRC, DG ECHO, DG ENTER), European member states, as well as representatives, both public and private, from European organisations (ESA, EUROCONTROL) and a range of different sectors in Sweden and beyond.

Quite a few of the participants had met already in Boulder in 2010. The FEMA Administrator, Mr. Craig Fugate, was with us in spirit.

Hopefully the Stockholm roundtable has moved us a few steps closer to a common Euroatlantic agenda for concrete action. One thing is certain – MSB will continue to promote international and European cooperation for the important task of building resilient societies, able to withstand also the risks from extreme space weather.

Stockholm, October 2012

A handwritten signature in black ink, appearing to read 'Helena Lindberg', with a stylized, cursive script.

Helena Lindberg
Director General, MSB

Structure of the event

1. Structure of the event

Director General **Helena Lindberg** welcomed the participants to Stockholm, expressing hopes for an “action-oriented discussion” across the various communities (academic, policy and science) represented at the Roundtable.

The scene was set by key note speeches given by **Dr. Stephan Lechner**, Director of the Institute for the Protection and the Security of Citizens at the European Commission Joint Research Centre (JRC), and **Carole Cameron**, Director of International Affairs at DHS-FEMA. Dr. Bengt Sundelius, Professor and Special adviser at MSB, chaired the introductory session.

Stephan Lechner provided a broad overview of our growing dependency on Global Navigation Satellite Systems (GNSS). He also described the efforts that are taken at national and EU-level to advance our understanding of extreme space weather events and their effects on society. International awareness of extreme space weather has increased over the past few years but “the topic is still too space-oriented”. The UK was mentioned as an example of a country where the various expert communities have been successful at collaborating and turning knowledge and awareness into political action. Dr. Lechner advocated a greater focus on creating cross-sectoral platforms at EU and international level to develop a scientific basis for policy making.

Carole Cameron focused her key note remarks on the follow-up of a joint workshop held by FEMA and MSB in 2010 on the management of an extreme space weather event. She described the progress made in a number of areas for Euro-Atlantic cooperation such as “the need to routinely exchange threat and common operating picture with international partners” and “the need to integrate space weather experts and researchers into the emergency management sector”. Her conclusion was positive “a lot has happened over the past two years” the lines of communication across the Atlantic have been strengthened but more work remains.



The rest of the program was divided into three consecutive sessions:

Session I (“Early-warning”) discussed the strengths and weaknesses of the existing international space weather prediction capability. Measures towards increased international redundancy and resilience were addressed by the panel as well as the potential benefits of developing international standards for measurement and data exchange. The speakers also pointed to the many challenges in conveying alerts that are well received and understood by the end-users.

Session II (“Assessing risks and managing vulnerability”) devoted its **first part** of the discussion to the societal impact of space-weather related disruptions in Global Navigation Satellite Systems (GNSS), including the link between GNSS and SCADA systems. The focus was on impact in three critical sectors: electricity supply, air transportation and telecommunications. The vulnerability of the internet was also addressed by one of the key-note speakers as well as the challenges of developing insurance solutions focused on space weather impact.

The **second part** of Session II contained a panel dealing with the integration of risks from extreme space weather into processes for national risk assessment. Examples were given from the Netherlands and Sweden. In this context there was also a discussion – supported by a contribution from the European Commission – on the possibilities for enhanced European and Euroatlantic cooperation, notably in developing and exchanging risk scenarios and non-sensitive data on impact.

Session III (“Knowledge gaps, research, technology and innovations”) focused inter alia on the possibilities of making efficient use of the next European Framework Program for Research, Horizon 2020. A priority area for future research and technology development was agreed to be tools and methods for better understanding the impact of space weather on vital societal functions.

Overall conclusions

2. Overall conclusions

- Awareness of the risks from space weather is high among the community of experts but **further work remains to turn this awareness into political action.**
- There are still **major knowledge gaps** when it comes to **understanding the direct and indirect implications of an extreme space weather event on society at large** (cascading effects and interdependencies.) A better understanding of societal impact (based on robust scientific findings) is essential for policy development and decision making.
- **International and EU collaboration** on developing space weather resilience remains a **critical precondition for future progress.**
- There is a need for more **comprehensive platforms for pooling existing knowledge** at various levels (national, European and international).
- There is a need for further work on **methodological frameworks that can be applied and understood across professions and disciplines** – bringing together space and non-space scientists, modellers, forecasters, insurance industry, operators and disaster managers.

**Towards a common
agenda for action**

3. Towards a common agenda for action: Recommendations for Science, Operations and Policy

The Stockholm Roundtable covered many topics but agreement was reached on a number of concrete recommendations for action. These are directed towards the world of science, those engaged in operations and the policy makers. We start with addressing some of the identified knowledge gaps where science may hopefully contribute to improved solutions.

Recommendations for Science:

1. More investments are needed in **S&T programs focused on tools and methods aimed at understanding the societal impact** resulting from extreme space weather events.
2. It is essential to create a **solid link between space research and security research focused on critical infrastructure protection** within the future European Framework Research Program, **Horizon 2020**.
3. There is a particularly strong demand for **scientifically validated worst-case scenarios** providing decision-makers with a better understanding of the fundamental question: “How big is big?” The results of ongoing work in this area (c.f. current project at NASA), needs to be swiftly disseminated to the wider international community of space weather experts and risk managers.
4. More could be done to **match existing European research programs with corresponding programs in the US**. One example would be the European SESAR program (The Single European Sky ATM Research Program) which could be matched with research programs run by NASA focused on the integration of technologies into the Next Generation Air Transportation System (NextGen).
5. Consideration should be made of the need to establish a **thematic work area within the European Reference Network for CIP (ERNCIP) focusing on GNSS and extreme space weather**. ERNCIP, which is managed by the European Commission’s Joint



Research Center, links together test facilities, laboratories and research institutes across Europe in different areas.

6. There is a need to **develop standards for testing GNSS receivers against space weather effects**. The purpose is twofold – to understand the performance of GNSS-receivers and to increase the robustness of GNSS-receivers for space weather. The standard should include models for different categories of space weather from normal to extreme.
7. There is a **critical need for investments in international solar monitoring capabilities such as coronagraphs**. The NASA SOHO LASCO coronagraph, used by the SWPC/NOAA in the US, currently provides a unique view of, and advance warning about, potential solar storms. If it should fail before any solution is found on replacement, its absence would significantly degrade international operational space weather forecasts.
8. The **research program “Space Situational Awareness” (SSA), run by the European Space Agency (ESA)** is an important vehicle for future European research in the area of extreme space weather. Sweden (c.f. MSB and the Swedish Armed Forces) should consider a contribution within the SSA program. The SSA program will inter alia contain the development of a coronagraph. The Swedish National Space Board can help coordinate Swedish participation in SSA.

Recommendations for Operations:

1. There is a need to develop methods and models that can help **bridge the communication gap between senders and receivers of alerts and forecasts**. The people who receive the alerts need to understand what **they mean and how to act**. There is work under way aimed at linking alerts to impact assessments (NOAA and ESA reported about ongoing efforts). The good work needs to be shared and further developed internationally together with regional warning centers, emergency management organizations and operators.
2. **The international network for space weather alerts should be further solidified and better integrated with the international emergency management community**. At the direction of the FEMA Administrator, FEMA's daily situation reports now

track space weather events (including geomagnetic storms, solar radiation storms, radio blackouts, the impact on high frequency communications, and sunspot activity). Situation Reports from the European Union Monitoring and Information Center (EU MIC) and NATO's Euro-Atlantic Disaster Response Coordination Centre are shared with FEMA, and FEMA's Daily Situation Reports are shared with European partners through EU MIC. More could however be done in terms of strengthening and connecting the early warning networks at a national, regional and international level.

3. There is a need for a **space weather scenario bank at EU and international level** to draw upon for training and planning.
4. The relationships between space weather scientists, bodies in charge of operational space weather prediction and the emergency management community could be further improved (knowledge building and awareness raising) by developing **systems for liaison and expert exchanges**.

Recommendations for Policy:

1. There is a need for continued efforts to develop **standards and harmonized definitions for international data exchange** (to improve forecasting and modeling).
2. The **"human infrastructure"** needs to be made more robust and prepared for managing extreme space weather events by greater investments in (scenario based) training. More focus should be placed on **introducing extreme space weather within existing training programs and contingency plans** at different levels.
3. The possibility of arranging a **US National Level Exercise on extreme space weather** should be considered. Europe could follow suit by organizing a **pan-European exercise** on the same topic (c.f. previous ones on cyber and on pandemics).
4. There is also a need to **support technological developments** in relation to **GALILEO and GMES with related education and training activities**.

5. Investments in training and exercises should be combined with a greater focus on **identifying and sharing lessons learned**, in an international perspective. Within the US, the summary report developed after the 2010 Boulder workshop continues to raise awareness, particularly within the emergency management community.
6. An increasing number of countries are developing national processes **for risk assessment** covering also the risks from extreme space weather. This is an important development. Within the EU, the European Commission is well positioned to provide support to individual member states with data, methodology and the sharing of risk scenarios.
7. There are also good reasons for developing **Euro-Atlantic cooperation in relation to risk assessments on extreme space weather** (possibilities are provided by the current Administrative Arrangement between FEMA and DG ECHO and the cooperation agreement between JRC and NOAA).

**Selected key points from
the different sessions
and panels**

4. Selected key points from the different sessions and panels

Session I: Early warning

Chair: *Alois Sieber*
Senior Adviser,
Besozzo, Italy

Contributions by: *William Murtagh*
Program Coordinator,
Space Weather Prediction Center, US/NOAA

Juha-Pekka Luntama
Head of SSA-SWE Segment,
European Space Agency (ESA)

Peter Löfwenberg
POC Climatology and Space Weather,
Swedish Armed Forces

- NOAA SWPC introduced the session by defining the key mission of early-warning: *“Provide the right information .. in the right format .. at the right time ... to the right people .. to make the right decision”*.
- On July 23, 2012, there was a solar storm (**the “Far side event”**) that probably could have reach the same magnitdue as the Carrington event in 1859 (G5/Kp9) if it was directed at Earth (G5/Kp9). Luckily the magnetic orientation pointed away from Earth (!!) – if not, the consequences could have been disastrous.
- Despite best efforts the international space weather **forecasting capability remains limited**.
- Examples of **challenges** mentioned:
 - There are currently no solar flare warning capabilities. Some positive research results but a long way to go before the space weather community can produce imminent flare warnings.
 - Limited forecast/warning capability for solar radiation storms.

- Good/reasonable forecast capabilities for geomagnetic storms but not possible to determine the magnetic direction of a storm.
- No possibilities to forecast a major solar event weeks, months or years in advance – except statistically.
- Examples of **achievements** so far:
 - We can detect conditions that are favourable for solar events.
 - We can detect solar events when they take place.
 - We can improve and confirm the predictions as the event progresses (especially CMEs).
- There was agreement in the panel that ways of maintaining and improving the international space weather prediction capability would be to:
 - Secure future resilience in solar monitoring capabilities such as coronagraphs.
 - Develop more advanced forecasting models.
 - Improve international exchange of data based on common standards.
 - Find ways of translating forecasts and alerts into a language better understood by end-users.
 - Increase our understanding of the vulnerability and impact of different space weather events on vital societal functions at home and in the context of international missions.

Session II: Assessing risks and managing vulnerabilities

First part of Session II

Chair: *Alois Sieber*
Senior Adviser,
Besozzo, Italy

Contributions by: *Reto Schneider*
Head of Emerging Risk Management,
Swiss Re

Robert Malmgren
Consultant specialized in SCADA security,
Romab

Fredrik Marsten Eklöf
Senior analyst specialized in GNSS vulnerability,
Swedish Defence Research Agency

- A prolonged power blackout is one of the more challenging potential impacts of an extreme space weather event. The impact may be felt across regions and last for days to months. **The impact of such an event goes beyond the scope of insurance and requires collaboration across governments, businesses and society as a whole.**
- **An Insurers' Working Group on Solar Storm Risk has been established** to consider the possible contribution of the insurance sector in managing the consequences of space weather events and to help raise awareness (Swiss Re, Allianz, Lloyds, Munich re, Zurich).
- According to estimates (Swiss Re), a worst case scenario of economic loss from a severe solar storm ("Carrington-type event") – including GIC damage to 10% of transformers in a specific region, total blackout during 3 weeks - amounts to 132 395 mUSD for Europe (163 866 mUSD for US and Canada).
- Loss prevention and emergency measures by governments and the electric power industry (such as shut down/circuit break) are being discussed – but not everywhere and not enough.

- Some of the biggest hurdles to be overcome are:
 - Short term cost/benefit thinking in businesses
 - Current vulnerabilities are not yet sufficiently stress tested by historical events. Mind-set of denial in the face of major events. Perceptions that “**our power grid is too big to fail**” – at least from a political perspective.....
 -and the financial crisis goes on, government debt is still on the rise and not enough money is invested in infrastructure...
- There is still a considerable lack of awareness in society and among operators in charge of vital societal functions of what the space weather impact may be on systems dependent on GNSS.
- SCADA systems dependent on GNSS are particularly vulnerable to so called “**spoofing attacks**” where fake GNSS senders are being used to manipulate/distort time.
- **Standards for testing GNSS receivers** need to be developed. Such standards will increase our understanding of the performance of GNSS receivers and help reduce the vulnerability of vital systems to the impact from extreme space weather. The standard may include models for several different categories of space weather from normal to extreme.

Impact on Air Transportation

Contributions by: *Emilien Robert*

Navigation and Space Weather Expert,
Eurocontrol

Thomas Allard
Director General,
LFV

- There has been a 45% increase in the number of passengers over the last decade (a doubling since mid 80’s) and air transport will continue to grow.
- **Technological development** in the air transport sector, necessary to reduce costs (air traffic management costs over coming years will be reduced by 50%) means **more automation and more reliance on satellites** (for communication, navigation and surveillance), **leading to a sharp increase in vulnerability against the consequences from extreme space weather.**

- Just like in other sectors, there are many interdependencies between technical systems resulting in a **wide range of expected and unexpected knock-on effects from space weather disruptions**.
- There is still a great **lack of awareness and understanding of the risks of extreme space weather among key industrial stakeholders**.
- There has not been enough consideration of possible “**double failure scenarios**” such as an ash cloud situation combined with a solar storm.
- There is currently an initiative by the United Nations organization for civil aviation, ICAO, to set up a **worldwide system for navigation warnings to airlines and pilots**. This system will use current networks to get information about solar activities.
- The European Organization for the Safety of Air Navigation (EUROCONTROL) has established a **web-based information system (SKYBRARY) on the impact of space weather on aviation**: www.skybrary.aero/index.php/Impact_of_space_weather_on_aviation

Impact on Electricity Supply

Contributions by: *Mikael Odenberg*
 Director General,
 Svenska Kraftnät (Swedish national grid)

Magnus Ek
 Chief Security Officer,
 Vattenfall AB

- We have a lot of knowledge about the space weather phenomenon as such but less knowledge about the impact this may have on our developing technical infrastructure. It seems clear that a development of **smart grids will increase our vulnerability to GNSS disruptions**.
- So far the impacts from occurred space weather events on the grid have been manageable – **the concern is for the really big one**. If we end up in a situation where 5-10 transformers fail we are facing serious problems (in Sweden). Some transformers may take 1-2 years to replace!

- What actions are we prepared to take the day we get an alert for a really extreme event? Shall we close down the grid for preventive purposes? How will that decision be made?
- As long as shut-downs are planned and coordinated the process is manageable but uncontrolled developments would provide a major challenge. **It is not only the process of shutting down the grid – the start-up after a long shut-down is another area of concern.**
- More back-up equipment is needed and higher demands should be placed on new equipment (e.g. robustness against GIC)
- The challenges of extreme space weather are not yet on the political agenda in many countries, Sweden is an example. **It is only when it becomes a priority at the political level that operators in various sectors will start dealing with these difficult questions.**

Impact on Telecommunications and the Internet

Contributions by: *Per-Olof Hedekvist*

SP Technical Research Institute of Sweden
Measurement Technology

Ove Landberg

Head of Section,
the Swedish Post and Telecom Authority (PTS)

Patrik Fältström

Head of Research and Development,
Netnod

- **Most of the possible effects of extreme space weather events on telecommunications are indirect and related to power supply disruptions and GNSS disruptions.**
- Power supply disruptions will impact access networks within hours, not days. National GSM networks can typically tolerate power supply failures of around 2-3 hours (fixed networks 6-8 hours). Limiting factors from a preparedness perspective are a lack of mobile power generators and transportation and fuel. **It is necessary that telecom operators make sure they have adequate service level agreements with power suppliers.**

- In terms of **internet vulnerability** the current development towards **higher speed transmission** and **more players involved**, places greater demands on **synchronized (GNSS dependent) timestamps**.
- In Sweden there is ongoing work to establish a **GNSS independent source for time and information synchronization in communication networks** (based on atomic clocks). The research and development is carried out by SP Technical Research Institute of Sweden. There are plans to develop the system in a Nordic context and there is increasing interest from European countries.

Second part of Session II

Chair: *Alois Sieber*
Senior Adviser
Besozzo, Italy

Contributions by: *Ian Clarke*
Head of Unit,
DG ECHO, European Commission

Maaïke van Tuyl
Deputy programme manager Threats and
Capabilities, National Security Directorate,
Ministry of Security and Justice, the Netherlands

Kristina Westerdahl
Principal Analyst
MSB

- **Data and information on the risks from extreme space weather is fragmented across governments and the private sector and still largely unavailable to decision-makers and at-risk populations.**
- **A positive trend is that the risks from extreme space weather are increasingly included in national risk assessments.** National processes for risk assessment provide important vehicles for coherence and cross-sectoral coordination. In the UK the risk from space weather was added to the National Risk Register in 2011 and Norway included space weather in its *Nasjonal sårbarhets og beredskapsrapport* (NSBR) earlier this year.



In the **Netherlands** the impact of space weather is considered as part of the work underpinning the National Safety and Security Strategy. **Sweden** is currently dealing with a risk scenario involving GNSS disruptions as part of its national risk assessment and will develop further work on scenarios based on space weather impacts.

- The **Global Risks Report 2012** presented by the **World Economic Forum** identified vulnerability to geomagnetic storms as one of 50 key risks.
- At the EU-level, the Commission (DG ECHO) has developed **guidelines for national risk assessment** and is also working to finalise an overview of the major risks the Union is facing (to be ready in 2013) – including the risk from extreme space weather. The EU risk overview has a number of purposes:
 - identify areas where European cooperation may prove more effective than individual member states acting alone and inform policy makers of risks where further action is needed.
 - provide information on longer-term EU strategies and policies such as the 2013 EU climate adaptation strategy, Security Health Initiative, EU Internal security strategy etc, to help orient EU financial instruments.
 - provide generic information to inform the development of contingency planning at EU and national level within the framework of the EU Civil Protection Mechanism;
 - initiate the process towards developing a comprehensive risk/threat assessment envisaged as part of the implementation of the Solidarity Clause (article 222 TFEU) and contributing to a coherent risk management policy.

Session III: Knowledge gaps, research, technology and innovations

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- There are **still many unknowns in solar physics** (e.g. still not enough knowledge of when active regions may flare or how big the flare may be). Critical **space borne observations have to be ensured** (e.g. CMEs, solar wind). There is also a need to improve data availability through enhanced international ground based observation networks and the development of standards for data exchange.
- However, the **need for more/new knowledge is possibly even more urgent when it comes to understanding the impact of space weather on vital societal functions – at home - and in international missions**. There is a strong demand for **scientifically validated worst-case scenarios** providing decision-makers with a better understanding of the fundamental question: “How big is big?”

- Consideration should be made of the establishment of a **thematic work area within the European Reference Network for CIP (ERN-CIP) focusing on GNSS and extreme space weather**. ERN-CIP, which is managed by the European Commission's Joint Research Center, links together test facilities, laboratories and research institutes across Europe in different areas.
- The future European Framework Research Program, **Horizon 2020**, can be a **significant driver for innovation** but it is essential that a **solid link is created between programs focused on space research and those on security research, notably in the area of critical infrastructure protection**.
- The research program **"Space Situational Awareness" (SSA)**, run by the European Space Agency (ESA) is an important vehicle for future European research on extreme space weather. Sweden (c.f. MSB and the Swedish Armed Forces) should consider a contribution within the SSA program. The SSA program will inter alia contain the development of a **coronagraph**. The Swedish National Space Board can help coordinate Swedish participation in SSA.
- A catalogue of **"space weather assets" in Europe has been established by the European Space Agency (ESA)** (e.g. sensors on ground and on spacecraft; web portals; capacity for alert/report/forecast; data archive; networks etc.) – over 400 space weather assets have so far been identified and the catalogue is still not complete.
- **Swedish industry should be able to benefit from an increased attention to space weather issues** as a result of its skills' profile (e.g. well renowned communication technology research and atmospheric science research) and good reputation.

Next steps

5. Next Steps

This Stockholm round-table has identified a wide range of knowledge gaps but has also found agreement on a number of recommendations, providing a common agenda for action and a way ahead. Through joint international efforts in science and policy, we can develop new knowledge, new methods, models and instruments that will help us reduce existing vulnerabilities and stand more ready to cope with the potentially devastating impacts of extreme space weather. Any national measures that are taken over the coming years will need to consider the wider context of European and Euro-Atlantic cooperation.

It was suggested by several speakers that this round table should be followed in due time by a “review” conference, where an inventory of accomplishments could be made. Often the implementation of well understood and agreed upon solutions to security and safety matters is postponed or dismissed as other urgent policy matters appear. To avoid falling into this trap of neglect, we urge a systematic review within two years of the recommendations from this event. The work has just begun.

Annexes

6. Annexes

References

This Annex lists some important web pages.

FEMA – Space Weather

<http://www.ready.gov/space-weather>

NOAA – Space Weather Prediction Center

<http://www.swpc.noaa.gov>

European Commission JRC – Space Weather Awareness Dialogue

<http://ipsc.jrc.ec.europa.eu/index.php/Space-Weather-Awareness-Dialogue/710/0/>

ESA – Space Weather Web Server

<http://www.esa-spaceweather.net>

NATO – Space Weather

<http://ftp.rta.nato.int/public//PubFullText/RTO/TR/RTO-TR-IST-051//TR-IST-051-05.pdf>

SwissRe – Space Weather

http://www.swissre.com/corporate_solutions/satellite_hull_insurance.html

FOI Swedish Defence Research Agency

<http://www.foi.se/en/>

EUROCONTROL

<http://www.eurocontrol.int>

<http://www.eurocontrol.int/search/google-appliance/space%20weather>

LFV

<http://www.lfv.se/en/>

Svenska Kraftnät (Swedish national grid)

<http://www.svk.se/Start/English/About-us/>

VATTENFALL AB

<http://www.vattenfall.com/en/index.htm>

SP Technical Research Institute of Sweden Measurement Technology

<http://www.linkedin.com/groups/SP-Technical-Research-Institute-Sweden-3178080/about>

NETNOD

<http://www.netnod.se>

European Commission DG ECHO – Risk Reduction

http://ec.europa.eu/echo/policies/prevention_preparedness/dipecho_en.htm

UK National Risk Assessment

http://ec.europa.eu/echo/policies/prevention_preparedness/dipecho_en.htm

The Netherlands National Risk Assessment

<http://www.springerlink.com/content/l60t423960560140/>

Sweden National Risk Assessment

<https://www.msb.se/en/Products--services/Publications/Publications-from-the-MSB/A-first-step-towards-a-national-risk-assessment---Summary/>

European Commission DG ENTR – Space Research

http://ec.europa.eu/enterprise/policies/space/index_en.htm

European Commission – HORIZON 2020

http://ec.europa.eu/research/horizon2020/index_en.cfm

European Commission – ERNCIP

<https://erncip.jrc.ec.europa.eu>

European GNSS Agency

<http://www.gsa.europa.eu>

European Commission JRC – Impact Study on Unintentional Inteferece on GNSS Receiver

<http://publications.jrc.ec.europa.eu/repository/handle/111111111/15940>

European Cybersecurity Exercise

http://europa.eu/rapid/press-release_IP-12-1062_en.htm?locale=en

