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Draft report

Addendum

II. United Nations Programme on Space Applications

1. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 5, "United Nations Programme on Space Applications".

2. At the 806th meeting, the Expert on Space Applications made a statement outlining the activities carried out and planned under the United Nations Programme on Space Applications.

3. 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 5. A statement was also 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.

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

(a) "Education programmes for the new Asia-Pacific Centre in China", by the representative of China;

(b) "DropTES: a new fellowship programme of the Office for Outer Space Affairs at the Bremen Drop Tower", by the representative of Germany;

(c) "JAXA human spaceflight activities, contributions and Asian collaboration through the International Space Station/Kibo", by the representative of Japan;

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(d) “Opportunities for partnerships with the Office for Outer Space Affairs”, by the Office for Outer Space Affairs.

A. Activities of the United Nations Programme on Space Applications

5. 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.105/1062, paras. 2-10). The Subcommittee noted that the Programme for 2013 had been carried out satisfactorily and commended the work accomplished by the Office under the Programme.

6. The Subcommittee noted with appreciation the voluntary contributions (cash and in-kind) provided by various Member States and organizations for 2013 (see A/AC.105/1062, paras. 50-51).

7. The Subcommittee noted that the priority areas of the Programme were environmental monitoring, natural resource management, satellite communications for tele-education and telemedicine applications, disaster risk reduction, the use of global navigation satellite systems, the Basic Space Science Initiative, space law, climate change, the Basic Space Technology Initiative and the Human Space Technology Initiative.

1. Year 2013

Meetings, seminars, symposiums, training courses and workshops

8. With regard to the activities of the United Nations Programme on Space Applications carried out in 2013, the Subcommittee expressed its appreciation to the following Governments and entities for co-sponsoring the various workshops, symposiums and training courses held within the framework of the Programme, as referred to in the report of the Expert on Space Applications (A/AC.105/1062, para. 47 and annex I):

(a) The Governments of Austria, Belarus, China, Croatia, Indonesia, Pakistan, the United Arab Emirates and the United States;

(b) Belarusian State University; China Manned Space Agency; Chinese Society of Astronautics; Emirates Institution for Advanced Science and Technology; Faculty of Maritime Studies of the University of Rijeka, Croatia; Institute for Space Research of the Austrian Academy of Sciences; National Institute of Aeronautics and Space of Indonesia; and Space and Upper Atmosphere Research Commission of Pakistan;

(c) Inter-Islamic Network on Space Sciences and Technology (ISNET), International Committee on Global Navigation Satellite Systems (ICG), ESA and International Astronautical Federation.

Long-term fellowships for in-depth training

9. 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 five 12-month fellowships for postgraduate studies in global navigation satellite systems (GNSS) and related applications.

10. 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 annually accepted up to four doctoral students and two Master's degree students for postgraduate study.

11. The Subcommittee expressed its appreciation to the Government of Germany, which, in collaboration with the Centre of Applied Space Technology and Microgravity and the German Aerospace Center (DLR), introduced a new fellowship programme that provided a research team with the opportunity to conduct its own microgravity experiments at the Bremen Drop Tower in Germany.

12. The Subcommittee noted with appreciation the successful launch of the Zero-Gravity Instrument Project as part of the Human Space Technology Initiative of the Programme. The Project contributed to capacity-building in education and research on microgravity, in particular in developing countries.

Technical advisory services

13. 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.105/1062, paras. 38-46).

2. Year 2014

Meetings, seminars, symposiums, training courses and workshops

14. The Subcommittee recommended the approval of the following programme of meetings, seminars, symposiums, training courses and workshops for 2014:

(a) United Nations Expert Meeting on the International Space Station Benefits for Health, to be held in Vienna on19 and 20 February;

(b) United Nations/Morocco International Conference on the Use of Space Technology for Water Management, to be held in Rabat from 1 to 4 April;

(c) United Nations/Russian Federation Workshop on the Application of Global Navigation Satellite Systems, to be held in Krasnoyarsk, Russian Federation, from 26-30 May;

(d) United Nations/Austria Symposium on Space Science, to be held in Graz, Austria, in September;

(e) United Nations/International Astronautical Federation Workshop on Space Technology for Socioeconomic Benefits, to be held in Toronto, Canada, from 26 to 28 September;

(f) United Nations/Ecuador Workshop on Space Technology for Sustainable Development in Mountain Regions of the Andean Countries, to be held in Quito from 13 to 17 October;

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

(h) United Nations/China Workshop on Space Law, co-organized with APSCO, to be held in Beijing in November;

(i) United Nations/Abdus Salam International Centre for Theoretical Physics Workshop on the Use of Global Navigation Satellite Systems for Scientific Applications, to be held in Trieste, Italy, from 1 to 5 December.

B. Regional and interregional cooperation

15. The Subcommittee noted that the schedule of nine-month postgraduate courses for the period 2012-2014 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.105/1062, annex III).

16. The Subcommittee recalled that the General Assembly, in its resolution 68/75, had noted with satisfaction the progress on the establishment of a new regional centre for space science and technology education in Asia and the Pacific located at Beihang University in Beijing, as proposed by the Government of China, in particular the positive conclusion of an evaluation mission to Beihang University facilitated by the Office for Outer Space Affairs in September 2013.

17. The Subcommittee noted that the evaluation mission had resulted in the recommendation to accept the offer of the Government of China to establish a regional centre hosted at Beihang University.

18. The Subcommittee recalled that the General Assembly, in its resolution 68/75, had emphasized the importance of regional and interregional cooperation in the field of space activities to assist States in the development of their space capabilities and contribute to the achievement of the goals of the United Nations Millennium Declaration, and had noted in that regard the importance of the equal participation of women in all fields of science and technology.

19. The Subcommittee noted that the twentieth session of the Asia-Pacific Regional Space Agency Forum (APRSAF) had been held in Hanoi from 3 to 6 December 2013, with the theme “Values from space: 20 years of Asia-Pacific experiences”. The twenty-first session of APRSAF would be held in Tokyo in 2014.

20. The Subcommittee also noted that the African Leadership Conference on Space Science and Technology for Sustainable Development took place in Accra from 3 to 5 December 2013, with a focus on capacity-building, knowledge-sharing and the joint participation of African countries in mutually beneficial projects in the area of space science and technology for sustainable development, including the promotion of adherence to the outer space treaties by spacefaring and non-spacefaring countries.

21. The Subcommittee further noted that the seventh meeting of the Council of APSCO had been held in Beijing on 5 July 2013, at which it reviewed the progress on APSCO projects.

22. The Subcommittee noted that the pro tempore secretariat of the Sixth Space Conference of the Americas was continuing the implementation of the Pachuca Declaration, adopted at the Sixth Conference, held in Pachuca, Mexico, from 15 to 19 November 2010.

VI. Space-system-based disaster management support

23. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 9, "Space-system-based disaster management support".

24. The representatives of Chile, China, Egypt, Germany, India, Indonesia, Japan, Mexico, Pakistan and the United States made statements under agenda item 9. A statement was made under the item by the representative of Chile on behalf of the Group of Latin American and Caribbean States. A representative of the Office for Outer Space Affairs made a statement on the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (UN-SPIDER). During the general exchange of views, statements relating to the item were also made by representatives of other member States.

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

(a) "Space information technology application for disaster reduction", by the representative of China;

(b) "Use of space inputs in recent major disasters in India", by the representative of India;

(c) "Disaster management", by the observer for the International Society for Photogrammetry and Remote Sensing;

(d) "United Nations Platform for Space-based Information for Disaster Management and Emergency Response knowledge portal: gateway to space-based information for disaster risk management and emergency response", by a representative of the Office for Outer Space Affairs.

26. The Subcommittee had before it the following:

(a) Report on the United Nations/Germany Expert Meeting on the Use of Space-based Information in Early Warning Systems (Bonn, Germany, 25-26 June 2013) (A/AC.105/1047);

(b) Report of the Secretariat on technical advisory support activities carried out in 2013 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1056);

(c) Report on activities carried out in 2013 in the framework of the United Nations Platform for Space-based Information for Disaster Management and Emergency Response (A/AC.105/1057);

(d) Report on the United Nations International Conference on Space-based Technologies for Disaster Management: Disaster Risk Identification, Assessment and Monitoring (Beijing, 23-25 October 2013) (A/AC.105/1061).

27. The Subcommittee expressed its appreciation for the efforts of the Office for Outer Space Affairs to bring the reports on the activities of UN-SPIDER in 2013 to

its attention, and noted with satisfaction the progress made with regard to all activities planned in the framework of the programme, including the continuing support provided through the programme for emergency response efforts in connection with typhoon Bopha in Palau and the Philippines, typhoon Haiyan in the Philippines and the floods in northern Iraq and Baghdad.

28. The Subcommittee noted that in 2013, UN-SPIDER, with support from its network of partners, had carried out missions for advisory support in Ghana, Indonesia, Malawi and Viet Nam. Delegates noted with gratitude the training sessions held in Bangladesh, the Dominican Republic, Mozambique and the Sudan, organized as follow-up to the UN-SPIDER technical advisory missions carried out in previous years.

29. Some delegations acknowledged with appreciation the new developments with respect to the UN-SPIDER knowledge portal (www.un-spider.org), in particular the new interface in Spanish.

30. The Subcommittee took note of the technical advisory missions to be undertaken by UN-SPIDER in 2014 in Bhutan, El Salvador, Kenya and Mongolia, and noted the synergies and cross-border actions facilitated by the UN-SPIDER programme, for example, a regional workshop on early warning and monitoring of droughts in Central America, to be held in April 2014.

31. The Subcommittee welcomed planned outreach activities of UN-SPIDER to promote the use of space-based tools and information for global and regional initiatives such as the International Strategy for Disaster Reduction and the post-2015 development agenda.

32. 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 were supporting the UN-SPIDER programme, including the following activities: 18 activations of Sentinel Asia for floods, earthquakes, landslides and forest fires in Asia; the launch of the high-definition television camera system on the International Space Station, Kibo HDTV-EF, for emergency observation in the framework of 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); the completion by the DLR Center for Satellite-based Crisis Information (ZKI) of several operational mapping and analysis tasks for disaster events in Germany and worldwide; the promotion, through the Charter on Space and Major Disasters, of the Universal Access initiative; the progress of the Regional Visualization and Monitoring System (SERVIR) programmes in the Himalayas and Africa; and many further examples of products defined for specific and sectoral end-users at the national level.

33. Some delegations expressed the view that partnerships, international agreements and full and open data-sharing arrangements were becoming increasingly important to ensure the effective distribution of space-based data and their use by emergency managers and other responsible authorities worldwide. Various services provided by space agencies in the form of current satellite imagery or information ready for use in geographic information systems (GIS), in particular services used in flood and earthquake events, were noted.

34. The view was expressed that changes to the hydrological regime of the Nile river system could have important environmental impacts and were a matter of concern and that space-based information could be useful in evaluating and preparing for those impacts.

35. The Subcommittee took note of the expert contributions made by Member States and regional support offices in 2013 to all UN-SPIDER technical advisory missions, as well as their sharing of experiences with other interested countries.

36. The Subcommittee noted the broad interest and expert participation in the United Nations/Germany Expert Meeting on the Use of Space-based Information in Early Warning Systems, held in Bonn, Germany, on 25 and 26 June 2013, and the United Nations International Conference on Space-based Technologies for Disaster Management: Disaster Risk Identification, Assessment and Monitoring, held in Beijing on 23-25 October 2013.

37. The Subcommittee noted that the Office for Outer Space Affairs had hosted the fifth annual meeting of the regional support offices of UN-SPIDER in Vienna on 13 and 14 February 2014 to review the joint activities implemented in 2013 and to develop a joint workplan for 2014 and for the biennium 2014-2015. Meeting participants agreed to work through an online collaborative platform on issues such as monitoring the impacts of advisory services and to identify and prepare joint project proposals and prepare and develop recommended practices for disaster risk reduction and emergency response.

38. Some delegations expressed the view that the Office for Outer Space Affairs should explore establishing 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, particularly in developing countries.

39. The Subcommittee noted with satisfaction the signing, at the fifty-sixth session of the Committee on the Peaceful Uses of Outer Space, of an agreement between the Office for Outer Space Affairs and the Ministry for Civil Defence, Emergencies and the Elimination of Consequences of Natural Disasters of the Russian Federation, for the creation of a regional support office of UN-SPIDER.

40. The Subcommittee welcomed the fact that the 16 regional support offices of UN-SPIDER continued to successfully contribute to the activities of UN-SPIDER (see www.un-spider.org/network/regional-support-offices).

41. 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.

42. The Subcommittee noted that the Government of Mexico had initiated a review of the General Law on Civil Protection in order to address disasters that could occur due to outer space phenomena and that, once adopted, the text of the law would be shared with the Subcommittee.

43. The Subcommittee noted that the International Charter on Space and Major Disasters had been activated 38 times in 2013, including 30 activations involving

the Pléiades satellite constellation, and had already been activated 11 times in 2014. The Subcommittee noted in that regard that 50 per cent of activations in 2013 were for flood events.

VII. Recent developments in global navigation satellite systems

44. In accordance with General Assembly resolution 68/75, the Subcommittee considered agenda item 10, "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 global navigation satellite systems (GNSS) and new GNSS applications.

45. The representatives of China, Canada, Egypt, India, Italy, Japan, Mexico, the United Arab Emirates and the United States made statements under agenda item 10. During the general exchange of views, statements relating to the item were also made by representatives of other member States.

46. The Subcommittee had before it the following documents:

(a) Report on the United Nations/Croatia Workshop on the Applications of Global Navigation Satellite Systems (A/AC.105/1055);

(b) Note by the Secretariat on the Eighth Meeting of the International Committee on Global Navigation Satellite Systems (A/AC.105/1059);

(c) Report of the Secretariat on activities carried out in 2013 in the framework of the workplan of the International Committee on Global Navigation Satellite Systems (A/AC.105/1060).

47. The Subcommittee heard a scientific and technical presentation on "Use of global navigation satellite systems for space weather: the Italian case", by the representative of Italy.

48. The Subcommittee noted with appreciation the organization of a symposium on the theme "Commercial applications of global navigation satellite systems", which focused on important current topics for GNSS data providers and users.

49. The Subcommittee was informed that the Office for Outer Space Affairs, as the executive secretariat of ICG, was responsible for the coordination of the meetings of ICG and its Providers' Forum, which were held in conjunction with sessions of the Committee and its subsidiary bodies. It was noted that the executive secretariat also maintained a comprehensive information portal for ICG and users of GNSS services.

50. The Subcommittee noted that, with education and capacity-building forming the core of the ICG programme on GNSS applications, and pursuant to the ICG workplan, the Office for Outer Space Affairs organized regional workshops, training courses and technical seminars and supported their follow-up projects in the use of GNSS-related technologies in various fields of science and industry, including space weather effects on GNSS.

51. The Subcommittee also noted that the regional centres for space science and technology education, affiliated to the United Nations, had started to use the education curriculum on global navigation satellite systems (ST/SPACE/59). The

regional centres, which also served as information centres for ICG and its Providers' Forum, aimed to contribute to the creation of a knowledgeable workforce, which was necessary for the advancement of GNSS and its applications in the regions, particularly in developing countries.

52. The Subcommittee noted that the United Nations/Croatia Workshop on Applications of Global Navigation Satellite Systems had been held in Baška, Krk island, Croatia, from 21 to 25 April 2013. The Workshop was co-sponsored by the United States, through ICG. The Faculty of Maritime Studies of the University of Rijeka hosted the Workshop on behalf of the Government of Croatia. The Workshop was to develop a regional plan of action that would contribute to the wider use of GNSS technology and its applications, including the establishment of specific pilot projects in which interested institutions could work together at the national and/or regional level.

53. The Subcommittee noted with satisfaction that the eighth meeting of ICG and the eleventh meeting of the Providers' Forum, organized by the government of Dubai and hosted by the Emirates Institution for Advanced Science and Technology, had been held in Dubai, United Arab Emirates, from 9 to 14 November 2013. It was noted that the ninth meeting of ICG would be organized by the European Union and hosted by the European GNSS Agency in Prague, from 10 to 14 November 2014. The Subcommittee also noted the expression of interest by the United States in hosting the tenth meeting of ICG, in 2015.

54. 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 that the working groups had made substantive progress in furthering the workplans of ICG and its Providers' Forum, in particular with regard to the detection and mitigation of interference.

55. The Subcommittee noted that ICG had established the International GNSS Monitoring and Assessment Task Force in order to focus on identifying service parameters that should be monitored and to define the level of monitoring and methods for carrying it out. Consensus was also reached on the fact that achieving a fully interoperable GNSS space service volume would provide significant performance benefits that no single system could provide on its own.

56. The Subcommittee commended the Office for Outer Space Affairs on 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 through its programme on GNSS applications.

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

58. The Subcommittee noted that the Global Positioning System (GPS) of the United States continued to set a high standard of reliability, accuracy and service to the international community. It was noted that GPS had 31 operational satellites in orbit to ensure a baseline constellation of 24 plus 3 satellites to provide better coverage and availability around the world. It was also noted that seven of the

Block IIR-M satellites and four Block IIF satellites were broadcasting a second civil-use signal called "L2C". The IIF satellites were also broadcasting a civil-use signal on the L5 frequency, which would be used for safety-of-life applications.

59. The Subcommittee noted that the improved accuracy of the Wide Area Augmentation System enabled the United States Federal Aviation Administration to develop the localizer performance with vertical guidance (LPV) approach. It was noted that more than 60,000 aircraft and their operators were benefiting from the increased safety and capacity provided through the implementation by the United States of the satellite-based augmentation systems.

60. The Subcommittee noted the intention of the United States to continue improving the accuracy and availability of GPS through improved satellite and clock performance and modernized satellites, and to broadcast GPS signals free of direct user charges. It was noted that the United States was committed to keeping 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.

61. The Subcommittee noted that the Russian Federation's Global Navigation Satellite System (GLONASS) constellation currently consisted of 29 satellites in orbit. The Subcommittee also noted that infrastructure, built within the scope of the Emergency Road Assistance based on Global Navigation Satellite Systems project (ERA-GLONASS), would serve as the foundation for the development of navigation information systems, services, and equipment based on GLONASS technology in the Russian Federation, with benefits for all categories of users. The Subcommittee noted a series of successful launches as part of China's Beidou satellite navigation system and that the system had started providing initial positioning, navigation and timing services in the Asia-Pacific region. It was also noted that the Beidou ground-based enhancement system would help to improve Beidou's position accuracy and the reliability and integrity of its services, in order to meet the demands of civil aviation and other users.

62. The Subcommittee noted that India was currently implementing two paths in its satellite navigation programme: the GPS-aided GEO-augmented Navigation System (GAGAN), a satellite-based augmentation system; and the Indian Regional Navigation Satellite System (IRNSS), an independent regional system. It was noted that GAGAN had been established to provide increased position accuracy for civil aviation applications and better air traffic management, and that the availability of GAGAN signal-in-space would bridge the gap between the coverage areas of the European Geostationary Navigation Overlay Service (EGNOS) and Japan's Multi-functional Transport Satellite (MTSAT) Satellite-based Augmentation System (MSAS), thereby offering seamless navigation coverage to the aviation industry.

63. The Subcommittee also noted that IRNSS, to consist of a constellation of seven satellites, three of which are to be placed in geostationary Earth orbit and four in geosynchronous orbit, was in the implementation phase. The first IRNSS satellite was launched on 1 July 2013, and the full constellation was expected to be completed in 2015.

64. The Subcommittee noted that the formal operation of the Quasi-Zenith Satellite System (QZSS) of Japan was planned to begin in 2018, and that a constellation of seven satellites would be completed to improve positioning in the Asia-Pacific region, including the improvement of the capacity to respond to natural disasters. It was also noted that eight multi-GNSS application experiments, aimed at improving the position accuracy of multi-GNSS and QZSS, had been carried out in the region.

65. The Subcommittee noted that the Government of Canada had created the Federal Global Navigation Satellite Systems Coordination Board, with a three-year mandate, with the objective of fostering collaboration among the various departments of the Government and addressing issues related to the protection of the GNSS spectrum, in particular the detection and mitigation of local interference in Canada.

66. The Subcommittee noted with appreciation that Egypt and Mexico had reported on their projects and activities focused on helping to bring GNSS technology to the widest user community possible, as well as their participation in the programmes conducted by international partners.