



# General Assembly

Distr.: Limited  
28 February 2006

Original: English

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## Committee on the Peaceful

### Uses of Outer Space

Scientific and Technical Subcommittee

Forty-third session

Vienna, 20 February-3 March 2006

## Draft report

### Addendum

## V. Space debris

1. In accordance with General Assembly resolution 60/99, the Scientific and Technical Subcommittee continued its consideration of agenda item 8, "Space debris", in accordance with the workplan adopted by the Subcommittee at its forty-second session (A/AC.105/848, annex II, para. 6).
2. The representatives of Canada, China, France, India, Italy, Japan, the Russian Federation, Ukraine, the United Kingdom and the United States made statements on the item.
3. The Subcommittee heard the following scientific and technical presentations on the subject of space debris:
  - (a) "IADC observation campaigns", by the observer for the European Space Agency (ESA);
  - (b) "United States space debris research", by the representative of the United States;
  - (c) "Recent space debris mitigation activities in France" by the representative of France;
  - (d) "The new space programme of the Russian Federation and space debris problem", by the representative of the Russian Federation.
4. The Subcommittee had before it the following:
  - (a) Note by the Secretariat on national research on space debris, safety of space objects with nuclear power sources on board and problems relating to their



collision with space debris, containing replies received from Member States on the issue (A/AC.105/862);

(b) Progress report of the Chairman of the Working Group on Space Debris (A/AC.105/2006/CRP.19);

(c) Progress report of the Chairman of the Working Group on Space Debris (A/AC.105/C.1/L.284).

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

6. The Subcommittee agreed that Member States, in particular space-faring countries, should pay more attention to the problem of collisions of space objects, including those with NPS on board, with space debris and to other aspects of space debris, as well as its re-entry into the atmosphere. It noted that the General Assembly, in its resolution 60/99, had called for the continuation of national research on the question, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris and had agreed that international cooperation was needed to expand appropriate and affordable strategies to minimize the impact of space debris on future space missions. The Subcommittee agreed that research on space debris should continue and that Member States should make available to all interested parties the results of that research, including information on practices that had proved effective in minimizing the creation of space debris.

7. The Subcommittee noted with appreciation that a number of approaches and concrete actions, covering various aspects of space debris mitigation, had been adopted by some States, such as the re-orbiting of satellites, passivation, end-of-life operations and the development of specific software and models for space debris mitigation, in accordance with the Inter-Agency Space Debris Coordination Committee (IADC) Space Debris Mitigation Guidelines. The Subcommittee also noted that research on space debris observation technology, space debris environmental modelling and technologies to protect space systems from space debris and to limit a new generation of space debris were also being conducted.

8. Pursuant to paragraph 14 of General Assembly resolution 60/99, the Subcommittee, at its 648th meeting, on 27 February, re-established the Working Group on Space Debris, under the chairmanship of Claudio Portelli (Italy), to review the draft space debris mitigation guidelines of the Subcommittee arising from the intersessional and informal meetings of the Working Group.

9. At its [...]th meeting, on [...] March, the Subcommittee endorsed the report of the Working Group (see annex II to the present report).

10. The Scientific and Technical Subcommittee noted with appreciation the progress made by the Working Group on Space Debris on the development of the draft space debris mitigation guidelines of the Subcommittee and that consensus had been reached on the text of draft guidelines, contained in document A/AC.105/C.1/L.284, based on and consistent with the technical content of the IADC Guidelines. The Subcommittee also noted that the IADC Guidelines had been referenced as a document of a technical nature, while the space debris mitigation

guidelines of the Subcommittee would contain general recommendations and would not be more technically stringent than the IADC Guidelines.

11. The Subcommittee agreed that its draft space debris mitigation guidelines would be circulated at the national level to secure consent for approval of the guidelines by the Subcommittee at its forty-fourth session, in 2007.

12. The Subcommittee noted that it should consult IADC periodically regarding future revisions of the IADC Guidelines due to evolving technologies and debris mitigation practices and that the draft space debris mitigation guidelines of the Subcommittee should be amended in accordance with such revisions.

13. The Subcommittee noted that the implementation of space debris mitigation measures was being carried out by States on a voluntary basis through national mechanisms and that the draft space debris mitigation guidelines of the Subcommittee would remain voluntary, carried out through national mechanisms and not legally binding under international law.

14. The Subcommittee noted that some States had implemented, through their national space agencies, space debris mitigation measures consistent with the IADC Guidelines or had developed their own space debris mitigation standards based on the IADC Guidelines. The Subcommittee also noted that other States were using the IADC Guidelines, as well as the European code of conduct for space debris mitigation, as a reference in the regulatory framework established for national space activities.

15. Some delegations expressed the view that, in order for States to continue having unrestricted access to outer space, all space-faring countries should take the lead and implement space debris mitigation practices in their national activities as expeditiously as possible.

16. The view was expressed that States largely responsible for the creation of the present situation and those having the capability to take action on space debris mitigation should contribute to space debris mitigation efforts in a more significant manner than other States.

17. The view was reiterated that the outer space environment should be preserved, and early warning systems should be activated, to enable all States, in particular developing countries, to explore outer space for peaceful purposes and conduct space activities without any constraints.

18. The view was expressed that the issue of space debris should also be considered by the Legal Subcommittee.

19. The view was expressed that space debris mitigation practices were not limited by the licensing of a space system but continued with the treaty-derived need for supervision and control, which was necessary throughout the operational and disposal phases of a space system.

20. The view was reiterated that compliance with all space debris mitigation measures would involve additional costs for all commercial operators, and it would therefore be desirable to explore ways and means of providing technical and economic support.

21. The Subcommittee expressed its appreciation to the Chairman of the Working Group and to the acting Chairman, Detlef Alwes (Germany) for their able leadership and dedication to the work of the Working Group. The Subcommittee also noted with appreciation the commitment of member States of the Committee in striving to develop the draft space debris mitigation guidelines.

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

22. In accordance with General Assembly resolution 60/99, the Scientific and Technical Subcommittee continued its consideration of agenda item 9, "Use of nuclear power sources in outer space", under the multi-year workplan for the period 2003-2007, adopted at its fortieth session (A/AC.105/804, annex III) and amended at its forty-second session (A/AC.105/848, annex III).

23. The representatives of the United Kingdom, the United States and Venezuela (Bolivarian Republic of) made statements under the agenda item.

24. The Subcommittee noted with satisfaction the successful conclusion of work of the workshop on the objectives, scope and general attributes of a potential technical safety framework for nuclear power sources in outer space, which had been organized jointly by the Subcommittee and the International Atomic Energy Agency in Vienna from 20 to 22 February 2006, pursuant to General Assembly resolution 60/99.

25. The members of the Subcommittee expressed their gratitude to the International Atomic Energy Agency for having co-sponsored the workshop. They also thanked the Government of the United States for having sponsored the interpretation services provided for the workshop.

26. The Subcommittee agreed that continued effort towards the establishing of an international technically based framework of goals and recommendations for the safety of planned and currently foreseeable nuclear power source applications in outer space should be encouraged.

27. The view was expressed that Member States had agreed in the Vienna Declaration to advance scientific knowledge of space and protect the near and outer space environments through research on designs, safety measures and procedures associated with the use of nuclear power sources (NPS) in outer space. That delegation was of the view that all users of space should consider the possible consequences of their ongoing or planned NPS activities in space before further irreversible actions were taken that could affect the future utilization of near or outer space.

28. The view was expressed that the NPS applications used in space missions represented a key element that could assist all States in meeting the challenges and objectives of space exploration, taking into consideration that discussions regarding NPS at the national and international levels should have a solid technical foundation.

29. The view was expressed that missions carrying NPS on board should seriously consider the possible impact that such sources could have on human life and the environment. That delegation expressed its concern over the lack of a specific

commitment for establishing a work timeline leading to regulation, by the Committee, of existing or planned missions using NPS on board.

30. The Subcommittee noted the recent successful launch by the United States of the first robotic scientific mission to Pluto, which was made possible by a nuclear power source, providing vital spacecraft power and instrument heating.

31. Pursuant to General Assembly resolution 60/99, the Subcommittee, at its 644th meeting, on 23 February, reconvened its Working Group on the Use of Nuclear Power Sources in Outer Space under the chairmanship of Sam A. Harbison (United Kingdom). The Working Group held [...] meetings.

32. The Subcommittee noted with satisfaction the excellent progress made during the intersessional period by the Working Group, in accordance with the multi-year workplan, on the development of potential implementation options for establishing an international technically based framework of goals and recommendations for the safety of planned and currently foreseeable NPS applications in outer space.

33. The Subcommittee noted that, at its current session, the Working Group had discussed the results of the workshop and developed a preliminary draft report of the workshop (see annex [...], appendix [...], to the present report).

34. At its [...] meeting, on [...], the Subcommittee endorsed the report of the Working Group (see annex [...], appendix [...], to the present report).

35. The Subcommittee endorsed the recommendation of the Working Group that it continue intersessional work on the topics described in the multi-year workplan as endorsed by the Subcommittee at its fortieth session (A/AC.105/804, annex III) and amended at its forty-second session (A/AC.105/848, annex III). The Subcommittee noted that the Working Group had agreed to hold its intersessional meeting in Vienna from 12 to 14 June 2006, during the forty-ninth session of the Committee on the Peaceful Uses of Outer Space.

36. The Subcommittee expressed its appreciation to the Chairman of the Working Group for his leadership in ably guiding the work of the Working Group.

## **VII. Space-system-based telemedicine**

37. In accordance with General Assembly resolution 60/99, the Scientific and Technical Subcommittee considered agenda item 10, "Space-system-based telemedicine", under the three-year work plan adopted at its fortieth session (A/AC.105/[...], annex [...]). Pursuant to the workplan, in 2006, member States of the Committee were invited to make presentations on possible bilateral or multilateral projects that would further develop space-based telemedicine applications through international cooperation.

38. The representatives of Argentina, Canada, Chile, China, France, India, Italy, Nigeria and the United States made statements on the item.

39. The Subcommittee heard the following scientific and technical presentations on the item:

(a) "The international seminar 'Application of space methods for studying the problems of human health, potentially dangerous and catastrophic phenomena

with the use of universal micro-satellite platforms”, by the representative of the Russian Federation;

(b) “Special satellite communication system for the development of telemedicine services in the Russian Federation”, by the representative of the Russian Federation;

(c) “Terrestrial benefits of advanced healthcare technologies developed and used by NASA”, by the representative of the United States.

40. The Subcommittee noted the use of space technology for early warning and monitoring of indicators of dengue, Chagas’ disease, malaria, leishmaniasis, hantavirus, meningitis, pneumopathies, avian flu, haemorrhagic fever, yellow fever and other zoonotic, airborne and waterborne diseases. The Subcommittee noted ongoing bilateral projects for monitoring outbreaks of those diseases, as well as plans for similar multilateral projects.

41. The Subcommittee noted that the capabilities developed for long-duration space flight were applied to provide medical services in disaster-hit areas, in rural and remote locations and on board aeroplanes. The Subcommittee also noted that knowledge of human health in outer space was being successfully used in standard medical practices, in particular in cases involving long periods of bed rest.

42. The Subcommittee noted that telemedicine was becoming an integral component of health care and that it was applied in offsite radiological services, cardiac monitoring, specialist referrals, correctional care and tele-education in medical sciences. The Subcommittee also noted that telemedicine reduced travel time for practitioners and hospitalization periods and that it was being readily accepted by patients. The Subcommittee further noted that recent developments in telecommunications, biomedical technologies and small electronic devices, as well as lower technology costs and the availability of the Internet, had expanded the possibilities for providing telemedicine services globally.

43. The Subcommittee took note of bilateral and multilateral projects that demonstrated and evaluated new medical diagnostic and therapeutic technologies to enhance the delivery of state-of-the-art medical care in remote areas and harsh environments.

44. The Subcommittee noted that space-system-based telemedicine could bridge disparities in the quality of medical services in different parts of a country by providing access to a database of expert knowledge and connectivity for data transfer in areas with underdeveloped infrastructure. In that regard, the Subcommittee also noted the broader use of space-based telemedicine and the operationalization of projects in space-system-based telemedicine at the national level.

45. The Subcommittee noted with appreciation regional capacity-building activities, as well as the establishment of task forces at the national and regional levels to develop project proposals using space technology for health services. The Subcommittee also noted that the Office for Outer Space Affairs and several space agencies had held, in 2005, two regional workshops on the use of space technology for human health for countries in Asia and the Pacific and in Latin America and the Caribbean.

46. The Subcommittee noted that success in the application of space technologies in health care depended on their cost-effectiveness. The Subcommittee also noted with satisfaction that obstacles to the development of telemedicine, such as ethical and regulatory barriers, as well as lack of acceptance of the use of telemedicine by the traditional medical establishment, were being overcome.

47. The Subcommittee noted with satisfaction that a number of planned satellites would be used to provide, among other things, telemedicine services.

48. The Subcommittee urged Member States to continue to initiate bilateral and multilateral cooperative projects in space-system-based telemedicine in developing countries, in order to bring better health-care services to the populations of those countries. The Subcommittee also urged the specialized agencies of the United Nations system involved in health-related areas to explore possibilities of working with Member States in developing and implementing projects in space-system-based telemedicine.