



# General Assembly

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**Committee on the Peaceful  
Uses of Outer Space**  
**Scientific and Technical Subcommittee**  
**Forty-eighth session**  
Vienna, 7-18 February 2011

## Draft report

### Addendum

## V. Space debris

1. In accordance with General Assembly resolution 65/97, the Subcommittee considered agenda item 7, “Space debris”.
2. The representatives of China, France, India, Indonesia, Japan, the Russian Federation, Ukraine, the United States and Venezuela (Bolivarian Republic of) made statements under agenda item 7. The representatives of Argentina and Italy made a joint statement. During the general exchange of views, statements relating to the item were also made by representatives of other member States and by the representative of Colombia on behalf of the Group of Latin American and Caribbean States.
3. The Subcommittee heard the following scientific and technical presentations:
  - (a) “Analysis of modes and estimation of costs to decrease the level of space contamination during the realization of space missions”, by the representative of the Russian Federation;
  - (b) “USA space debris environment, operations and policy updates”, by the representative of the United States;
  - (c) “Overview of 2010 space debris activities in France”, by the representative of France;
  - (d) “Activity of the Russian Federation on the space debris problem”, by the representative of the Russian Federation;



- (e) "Detection and warning automated system of hazardous situations in near-Earth space (NES): state and perspective of development", by the representative of the Russian Federation;
- (f) "Space debris mitigation activities at ESA", by the observer for ESA;
- (g) "Towards long-term sustainability of space activities: overcoming the challenges of space debris", by the observer for IAASS;
- (h) "Two space debris issues: long-term cost of satellite operations and refining re-entry disposal hazards", by the observer for IAASS.

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.105/978 and Add.1);
- (b) Report of the International Interdisciplinary Congress on Space Debris entitled "Towards long-term sustainability of space activities: overcoming the challenges of space debris", contained in conference room paper A/AC.105/C.1/2011/CRP.14.

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

6. The Subcommittee requested IADC to inform it of any revisions made to the IADC Space Debris Mitigation Guidelines in the light of evolving technologies and debris mitigation practices.

7. 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 re-orbiting of satellites, passivation, end-of-life operations and the development of specific software and models for space debris mitigation. The Subcommittee also noted that research was being conducted in the areas of technology for space debris observation and continuous monitoring, space debris environmental modelling and technologies to protect space systems from space debris and to limit the creation of additional space debris.

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

9. The Subcommittee noted technical collaboration of member States in the area of space debris monitoring and mitigation, including training and the joint use of observatory facilities for sharing monitoring data.

10. The view was expressed that since the future of space exploration would depend largely on the effectiveness of space debris mitigation practices, all States, and in particular spacefaring nations, should pay attention to the issue.

11. The view was expressed that the cost of space debris mitigation measures should be shared by all space users equally and that sharing that cost would keep the business environment for space activities fair and competitive.

12. The view was expressed that States without the capability and expertise to fully implement the Space Debris Mitigation Guidelines of the Committee should benefit from the best practices of and training provided by States with relevant experience.

13. The Subcommittee agreed that States, in particular spacefaring nations, should pay greater attention to the problem of collisions of space objects, including those with nuclear power sources on board, with space debris and to other aspects of space debris, including its re-entry into the atmosphere. It noted that the General Assembly, in its resolution 65/97, had called for the continuation of national research on that question, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris and had agreed that international cooperation was needed to expand appropriate and affordable strategies to minimize the impact of space debris on future space missions. The Subcommittee agreed that research on space debris should continue and that Member States should make available to all interested parties the results of that research, including information on practices that had proved effective in minimizing the creation of space debris.

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

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

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

17. The view was expressed that, in connection with the problem of space debris, States should take into account that the Earth's space environment was a limited resource.

18. The view was expressed that space debris in the geostationary orbit had a unique character, such as periodical angle and inclination along the equatorial lines, and that therefore the increasing amount of space debris in that orbit was a matter of great concern.

19. The view was expressed that more transparency in the information on space debris, as well as on space activities of States, particularly activities that presented a risk of doing harm, was important for States and that it would enhance the awareness and capability of States in space debris monitoring.

20. The view was expressed that the Space Debris Mitigation Guidelines of the Committee should be further developed and that the Scientific and Technical Subcommittee and the Legal Subcommittee of the Committee should cooperate with the aim of developing legally binding rules relating to space debris.

21. The view was expressed that legally binding space debris mitigation measures were not necessary and that States should seek an acknowledgement, by the broadest possible community of nations, that space debris could be controlled and that national implementation of space debris mitigation practices was consistent with mission objectives and principles of cost-effectiveness.

## **IX. Near-Earth objects**

22. In accordance with General Assembly resolution 65/97, the Scientific and Technical Subcommittee considered agenda item 11, “Near-Earth objects”.

23. The representatives of Japan, Slovakia, the Russian Federation and the United States made statements under agenda item 11. During the general exchange of views, statements relating to this item were also made by representatives of other member States, the representative of Colombia on behalf of the Group of Latin American and Caribbean States, and by the observers for APSCO and IAU.

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

(a) “The first scientific light of the GMT millimetric telescope”, by the representative of Mexico;

(b) “NASA’s near-Earth objects program (Spaceguard)”, by the representative of the United States;

(c) “Towards a national NEO program”, by the representative of the Russian Federation;

(d) “Dawn of the age of solar system exploration: Hayabusa, Ikaros and the future”, by the representative of Japan;

(e) “Results from the NEO Mission Planning and Operations Group workshop”, by the observer for the Association of Space Explorers;

(f) “The Washington Summit of the Heads of Space Agencies in November 2010” and “Planetary defence conferences: sharing information on near-Earth objects threats and mitigation”, by the observer for the International Academy of Astronautics.

25. The Subcommittee had before it the following:

(a) Interim report of the Action Team on Near-Earth Objects (2010-2011) (A/AC.105/C.1/L.308);

(b) Note by the Secretariat on information on research in the field of near-Earth objects carried out by Member States, international organizations and other entities (A/AC.105/976);

(c) Note by the Secretariat on information on research in the field of near-Earth objects carried out by Member States, international organizations and other entities (A/AC.105/C.1/2011/CRP.12).

26. The Subcommittee noted that near-Earth objects were asteroids and comets with orbits that could cross the orbit of the Earth. The Subcommittee also noted that interest in asteroids was largely due to their scientific value as remnant debris from the process of the formation of the inner solar system, the potentially devastating consequences of such objects colliding with the Earth and the wide range of natural resources that they contained.

27. The Subcommittee noted the increased awareness of the global threat posed by the near-Earth objects and that early detection and precision tracking were the most effective tools for the management of threats posed by near-Earth objects. The Subcommittee also noted that any measures to mitigate such threats would require coordinated international efforts.

28. The Subcommittee welcomed the efforts made with respect to comprehensive national plans as well as the broadened international cooperation related to early detection, precision tracking, characterization and dissemination of data for the purpose of NEO threat detection, and agreed that efforts should be continued and expanded at the national and international levels.

29. The Subcommittee noted with appreciation the international projects undertaken by Member States to detect and characterize near-Earth objects, such as the Arecibo and Goldstone radio telescope facilities; the Panoramic Survey Telescope and Rapid Response System (Pan-STARRS); the Skalnaté Pleso Observatory; and the Asia-Pacific Ground-based Optical Satellite Observation System, which was expected to be completed by the end of 2012.

30. The Subcommittee noted with satisfaction the role of the Minor Planet Center, operated by the Smithsonian Astrophysical Observatory, in coordination with the International Astronomical Union, as a gateway and clearing house for collecting, validating and distributing all positional measurements of asteroids made worldwide and related comments. The Subcommittee also noted that since March 2010, the International Astronomical Union had maintained a web page presenting a chronology of milestones of near-Earth asteroid observations and research ([www.iau.org/public/neas/](http://www.iau.org/public/neas/)).

31. The Subcommittee welcomed past and upcoming missions investigating near-Earth objects, including the Dawn, Deep Impact, Stardust and the Wide-field Infrared Survey Explorer (WISE) spacecraft missions of the United States and the Near-Earth Object Surveillance Satellite mission of Canada.

32. The Subcommittee noted with satisfaction the successful return of the first sample return mission of the asteroid explorer Hayabusa of Japan on 13 June 2010.

33. The Subcommittee noted with satisfaction the holding, in Darmstadt, Germany, of the workshop on NEO mission planning and operations, organized by ASE and SWF and hosted by ESA, and noted that the results of the workshop had been provided to the Action Team on Near-Earth Objects for consideration in its future work.

34. The Subcommittee noted the success of an ongoing NEO search programme by the United States to detect at least 90 per cent of all near-Earth objects larger than 1 kilometre in diameter, as well as the objective of the recent NEO search programme of the United States to detect, track, catalogue and characterize NEOs with a diameter larger than 140 metres and achieve the detection of 90 per cent of such objects by 2020.

35. Pursuant to General Assembly resolution 65/97, the Working Group on Near-Earth Objects was reconvened, under the chairmanship of Sergio Camacho (Mexico). The Working Group on Near-Earth Objects held [...] meetings.

36. At its [...] meeting, on [...] February, the Subcommittee endorsed the report of the Working Group on Near-Earth Objects, including the agreement of the Working Group to continue its multi-year workplan in 2012 and 2013. The report of the Working Group is contained in annex III to the present report.

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

37. In accordance with General Assembly resolution 65/97, 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 at its fifty-second session.<sup>1</sup>

38. The representatives of Canada, Chile, China, France, Germany, Italy, Japan, the Russian Federation, South Africa, Switzerland and the United States 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 and by the representative of Colombia on behalf of the Group of Latin American and Caribbean States.

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

(a) “The role of TÜBITAK in recent developments in the field of space in Turkey”, by the representative of Turkey;

(b) “Procedure for risk assessment and identification of best practices to support the Working Group for Sustainability”, by the representative of Japan;

(c) “Space Situational Awareness update”, by the representative of the United States of America;

(d) “German national space situational awareness centre”, by the representative of Germany;

(e) “The Inter-Agency Space Debris Coordination Committee: an overview of the IADC scope and its activities”, by the representative of Germany in his capacity as member of the Inter-Agency Space Debris Coordination Committee;

(f) “A summary of the Galaxy 15 situation and its impact on space sustainability”, by the observer for the Secure World Foundation.

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

40. The Subcommittee had before it the following:

(a) Working paper submitted by the Chair of the Working Group on the terms of reference and methods of work of the Working Group on the Long-term Sustainability of Outer Space Activities of the Scientific and Technical Subcommittee (A/AC.105/C.1/L.307);

(b) Conference room papers containing comments on the long-term sustainability of outer space activities received from member States and permanent observers of the Committee (A/AC.105/C.1/2011/CRP.9, A/AC.105/C.1/2011/CRP.17 and A/AC.105/C.1/2011/CRP.20);

(c) Conference room papers containing a list of points of contact communicated to the Secretariat pursuant to the note verbale dated 11 October 2010 (A/AC.105/C.1/2011/CRP.10 and Add.1).

41. In accordance with General Assembly resolution 65/97, the Working Group was reconvened under the chairmanship of Peter Martinez (South Africa). The Working Group held [...] meetings.

42. Some delegations expressed the view that the Working Group would promote mutually beneficial international cooperation and dialogue on the sustainability, safety and security of space activities.

43. The view was expressed that the work of the Working Group was important for improving the international standards to be implemented by each spacefaring nation and each spacecraft and launch operator.

44. The view was expressed that the Working Group should operate in a well-balanced, pragmatic, efficient and open manner.

45. The view was expressed that the work of the Working Group should be guided by the principles of relevance and efficiency.

46. Some delegations expressed the view that the scope of work of the Working Group should neither duplicate nor overlap with existing mandates or ongoing operations of other subsidiary bodies of the Subcommittee.

47. The view was expressed that the Working Group should consider, among other things, future objectives and priorities of international space activities, and identify ways and means to make outer space activities sustainable in the long term.

48. At its [...] meeting, on [...] February 2011, the Subcommittee endorsed the report of the Working Group, contained in annex [...] to the present report and the terms of reference of the Working Group contained in the appendix to annex [...].

49. The Subcommittee agreed that any guidelines that might be developed should be implemented on a voluntary basis and be focused on practical and prudent short- and medium-term measures that could be implemented in a timely manner.

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

51. Some delegations stressed the need to take into consideration the contribution of space-based systems to sustainable development and avoid any measures that would limit access to space by States with emerging space capabilities. It was further stressed that full consideration should be given to the key concerns of developing countries and that setting overly high standards or thresholds for space activities in a way that might hinder the enhancement of capacity-building should be avoided.

52. Some delegations expressed the view that actions were necessary to reduce the risk to space activities of all space actors and ensure equitable access by all countries to the limited natural resources of outer space.

53. Some delegations emphasized the need for capacity-building to ensure that the required technical expertise was made available to Member States, in particular developing countries.

54. Some delegations expressed the view that the viewpoints of interested private sector entities involved in space activities should be taken into account when considering the long-term sustainability of outer space activities, and called upon wider international and industrial cooperation in that regard.

55. The view was expressed that the draft European code of conduct for outer space activities was a complementary initiative aimed at promoting, through voluntary measures of trust and transparency, the security of space activities.

56. The view was expressed that it was necessary to clearly define the purpose and range of the work to be conducted under the present agenda item and the expected outcomes, including the item's relationship to the draft European code of conduct for outer space activities, to the concepts "space traffic management" and "transparency and confidence-building measures" and to the Space Debris Mitigation Guidelines of the Committee on the Peaceful Uses of Outer Space.

57. The view was expressed that threats posed by the possible development of military capabilities in outer space could undermine efforts towards the sustainability of space activities in the future.

58. The view was expressed that it was important to have constructive dialogue and synergy between the Conference on Disarmament and the Committee on the Peaceful Uses of Outer Space.

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