

REGULATION OF SPACE DEBRIS: ON THE WAY TOWARDS INTERNATIONAL CUSTOMARY LAW?

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Abstract

Space debris has become one of the most discussed issues during the past decades. The framework of the existing space treaties is considered too general to regulate space debris. After many years of work, the Space Debris Mitigation Guidelines was adopted by UN General Assembly. While the legal effect of the UN resolution is open to discuss, a number of states have implemented the guidelines through national mechanism, which is possible to form international customary law.

1. Introduction

During the last decades, space debris has become one of the most discussed issues of the present and future development of space activities. Awareness of an emerging space debris problem dates back to early 1960s. Since then, the understanding of space debris has significantly improved.

Currently, approximately 19,000 objects larger than 10 cm are known to exist. The estimated population of particles between 1 and 10 cm in diameter is approximately 500,000. The number of particles smaller than 1 cm probably exceeds tens of millions.¹ Primary source of space debris include accidental and intentional break-ups or debris released intentionally during the operation of launch vehicle states and spacecraft.² Satellite collision also contributes to space debris, as in the case of the collision between Iridium-33 and Cosmos-2251. It is estimated that the debris population will steadily increase, which is an obvious threat to the security of outer space.

2. Obstacles of Regulating Space Debris within the Framework of International Space Treaties

The principal source of international space law is space treaties. When the issue of space debris comes out, people turn to space treaties to find legal basis of regulating space debris. However, none of the existing space treaties has specific provision of space debris. Moreover, there is little possibility that an international treaty dealing with space debris will be concluded in the near future. This could be attributed to the following three obstacles.

The first obstacle is the definition issue. None of the Outer Space Treaty, the Liability Convention, the Registration Convention, or any other international treaties gives the definition of space debris. The only relevant definition is "space object" in the Liability Convention,³ but it does not mention the term "space debris", and it is always controversial whether space debris falls

within the scope of space object. A technical definition appeared in the Technical Report of Space Debris in the Science and Technical Subcommittee (STSC) of the United Nations Committee On the Peaceful Uses of Outer Space (UNCOPUOS).⁴ For the purpose of a common understanding, the definition of space debris was proposed as “all manmade objects, including their fragments and parts, whether their owners can be identified or not, in Earth orbit or re-entering the dense layers of the atmosphere that are non-functional with no reasonable expectation of their being able to assume or resume their intended functions or any other functions for which they are or can be authorized”.⁵ However, there is no consensus in the UN on this matter.⁶ Before the definition issue is settled, it is difficult to apply existing space treaties to space debris.

The second obstacle to regulate space debris under an international treaty is the lack of provision in the existing treaties. Since the problem of space debris has occurred only in the last two decades of the twentieth century, it was beyond the consideration of the drafters of the treaties in the mid-twentieth century. When it comes to space debris, people generally refer to articles in Outer Space Treaty concerning obligation to carry on activities in accordance with international law,⁷ and state responsibility and liability,⁸ and the due regard to the corresponding interest of other state parties to the treaty.⁹ From the discussion in the past years, it is generally accepted that although the existing rules in space treaties provide general principles and form basis of

regulation of space debris, they seem to be too general to effectively deal with this issue.¹⁰

Another obstacle is the difficulty to reach agreement to develop an international treaty on space debris. Although an international treaty, which is legally binding, is considered to be the best form for a satisfactory solution,¹¹ and proposals to codify the debris mitigation practice are already being made, this is not supported by all space faring nations. At various times, some space faring nations asserted that the regulation of space debris is premature and could be counterproductive.¹² The reluctance to supporting initiatives for a new treaty on space debris is based on two reasons. First, states tend to be cautious in agreeing to international regulation when there is not a full understanding of the costs and effectiveness of particular measures.¹³ Secondly, as the technical matters, such as spacecraft design and operational criteria, will update from time to time, it is not the best solution to regulate these matters under an international treaty which is less flexible.

3. Other International Instruments Regulating Space Debris and Their Legal Effect

Despite the lack of treaty-like instrument, there have been some other international instruments regulating the issue of space debris. The elaboration of the Buenos Aires International Instrument on the Protection of the Environment from Damage Caused by Space Debris,¹⁴ submitted to the 66th Conference International Law Association in 1994, seems to be the

first draft international instrument specifically regulating the risks and consequences of space debris, and to constitute a useful starting point for further regulatory activities.

In the same year, the Inter-Agency Space Debris Coordination Committee (IADC) was established. It is an international governmental forum, the primary purposes of which are to exchange information on space debris research activities between member space agencies, to facilitate opportunities for cooperation in space debris research, to review the progress of ongoing cooperative activities and to identify debris mitigation options.¹⁵ The International Standard Organisation (ISO) also contributes to standards of space debris mitigation.

The STSC agreed to include the item of space debris in its agenda.¹⁶ In 1994, the STSC adopted a multi-year plan and established a special Working Group.¹⁷ After years of work, with the assistance of the IADC, the COPUOS Space Debris Mitigation Guidelines were adopted in 2007 and was endorsed by the UN General Assembly,¹⁸ which is “a key step in providing space faring nations with guidance on how to mitigate the problem of space debris”.¹⁹ The Guidelines are based on the technical content and basic definitions of the IADC Space Debris Mitigation Guidelines, taking into consideration the United Nations treaties and principles on outer space. It consists of seven guidelines which should be considered for the mission planning, design, manufacture and operational phases of spacecraft and launch vehicle orbital stages.²⁰ The space debris mitigation measure in the guidelines can be divided

into two broad categories: those that curtail the generation of potentially harmful space debris in the near term; and those that limit their generation over the long term.²¹

Obviously, guidelines are not binding as treaties and states have no legal obligation to follow the guidelines. But things are different when guidelines are adopted as UN resolution. The legal status of a UN resolution is open to discuss. Some member states of UNCOPUOS explicitly refer to a resolution as mere recommendation.²² Some other states treat a resolution as binding, because it was adopted unanimously and they consider the resolution to be declaratory of international customary law.²³ Although the Guideline adopted by the UN resolution cannot be made binding upon the Member States in the sense of a treaty, it reflects “a strong expectation that Members of the international community will abide by it”.²⁴ Consequently, “in so far as the expectation is gradually justified by states practice, a declaration may by custom become recognized as laying down rules binding upon states.”²⁵

Under the provision in ICJ Status, “international custom as evidence of a general practice accepted as law” forms source of international law.²⁶ Custom inevitably implies a certain period of time, but as regards the time factor, scholars such as Judge Lachs believe that a short period of time is not in itself a bar to the formation of a new rule of customary law.²⁷ Consequently, international customary law has in reality only one constitutive element, namely the *opinion juris* of States.²⁸

4. National Mechanism: from Guideline to Implementation

The Legal Subcommittee (LSC) of UNCOUOS included the item “General exchange of information on national mechanism relating to space debris mitigation measures” in its agenda this year. During the session, delegations of Canada, China, France, India, Italy, Japan, Russian Federation and United States presented information on their national mechanisms governing space debris mitigation and the ways in which they were implementing the Space Debris Mitigation Guidelines of the IADC and the Space Debris Mitigation Guidelines of the COPUOS.²⁹

The United States adopted NASA Technical Standard: Process for Limiting Orbital Debris in 2007³⁰ and published NASA Procedural Requirement for Limiting Space Debris³¹ and NASA Handbook for Limiting Orbital Debris in 2008.³² Space Agencies in Europe have developed technically oriented guidelines as a “European Code of Conduct” since the mid-1990. ESA developed its own “Requirements on Space Debris Mitigation for Agency Projects”,³³ which came into force on 1 April 2008.³⁴ They applicable to all future procurements of space systems and will be part of the “contractual baseline” in the invitation to tender and request for quotation of a space project.³⁵ Russian Federation developed its national standards on space debris mitigation entitled “National Standard of the Russian Federation: General Requirements to Spacecraft and Orbital Stages on Space Debris Mitigation”.³⁶ In Japan, JAXA Debris Mitigation

Standard consists of management requirements and technical measures which follows COPUOS Space Debris Mitigation Guidelines, IADC Space Debris Mitigation Guidelines and ISO Space Debris Related Standards.³⁷ China National Space Agency has put the issue on its agenda and is working on the development of the Space Debris Mitigation Design Standards.³⁸

These national guidelines are harmonised with the COPUOS and IADC guidelines, and consistent with the framework of international space treaties. Furthermore, national standards are better cope with domestic situation, thus more effective in terms of implementation.

5. Conclusion

The lack of provision on space debris in international space treaties and the obstacles to form a new treaty on space debris does not prohibit the development of regulation. While technical guidelines are developed by international organisations, these guidelines are to be implemented through national mechanism. While national standards of individual state follow the international guidelines of standard, they will absolutely improve the update of international guidelines. The measures on which states can reach agreement are possible to form international customs.

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<http://www.orbitaldebris.jsc.nasa.gov/faqs.htm>

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² Space Debris Mitigation Guidelines of the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space,

³ Article I (d) Liability Convention: “The term ‘space object’ includes component parts of a space object as well as its launch vehicle and parts thereof.”

⁴ Technical Report on Space Debris adopted by the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, 1999, A/AC.105/720, para. 6.

⁵ *Ibid.*

⁶ Niklas Hedman, COPUOS and Space Debris, presentation at the International Interdisciplinary Congress on Space Debris, 7-9 May 2009, Montreal, Canada.

⁷ Article III Outer Space Treaty.

⁸ Article VI Outer Space Treaty.

⁹ Article IX Outer Space Treaty.

¹⁰ See e.g., Mahulena Hošková, ‘Outer Space Treaty as a Framework for the Regulation of Space Debris’, (1997) *Proceedings of the Fortieth Colloquium on the Law of Outer Space*; Edward A. Frankle, ‘International Regulation of Orbital Debris’, (2000) *Proceedings of the Forty-Third Colloquium on the Law of Outer Space*; Vladimír Kopal, ‘Present International Principles Applicable to Space Debris and the Need for Their Supplement’, (1997) *Second European Conference on Space Debris*.

¹¹ See e.g., Kopal, *ibid.*, at 743.

¹² See e.g. Report of the Science and Technical Subcommittee on the Work of Its Thirty-third Session, 1996, A/AC.105/637, para. 141 and 142.

¹³ Steven A. Mirmina, ‘The Regulation of Orbital Debris through National Measures’, (2004) vol.XXIX *Air and Space Law*, 137 at 143.

¹⁴ See the ILA International Instrument on the Protection of the Environment from Damage Caused by Space Debris, published in Report of the Sixty-sixth Conference of the ILA, Buenos Aires 1994.

¹⁵ See <http://www.iadc-online.org/index.cgi>

¹⁶ See Report of the Scientific and Technical Subcommittee on the Work of Its Thirty-first Session, 1994, A/AC.105/571, para. 121.

¹⁷ See Report of the Scientific and Technical Subcommittee on the Work of Its Thirty-second Session, 1995, A/AC.105/605, para. 75-96.

¹⁸ A/RES/62/217.

¹⁹ Report of the Legal Subcommittee on Its Forty-eighth Session, 2009, A/AC.105/935, para.151.

²⁰ *Supra* note 2.

²¹ *Ibid.*

²² Bin Cheng, ‘United Nations Resolution on Outer Space: Instant International Customary Law?’ in *Studies in International Space Law* (1997), at 127.

²³ *Ibid.*

²⁴ *Ibid.* at 133.

²⁵ *Ibid.*

²⁶ Article 38, Statute of the International Court of Justice.

²⁷ I.H.Ph.Diederiks-Verschoor, *An Introduction to Space Law* (third edition 2008), at 11

²⁸ Cheng, *supra* note 22, at 138.

²⁹ Report of the Legal Subcommittee on Its Forty-eighth Session, 2009, A/AC.105/935, para.152.

³⁰ NASA-STD-8719.14 (With Change 4, approved 2007-08-28, with change of 2009-09-14).

³¹ NPR 8715.6A (effective since February 19 2008).

³² NASA-HANDBOOK 8719.14 (approved 2008-07-30).

³³ ESA/ADMIN/IPOL(2008)2, Annex 1.

³⁴

http://www.esa.int/esaMI/Space_Debris/SEM_QHL05VQF_0.html

³⁵ Heiner Klinkrad and Ulrike M. Bohlmann, Requirements on Space Debris Mitigation for ESA Projects, presentation to the 48th session of the Legal Subcommittee of the UNCOUOS.

³⁶

<http://ifvn.astronomer.ru/report/0000048/010/index.htm>.

³⁷ Space Debris Mitigation Mechanism in Japan, presentation to the 48th session of the Legal Subcommittee of the UNCOUOS.

³⁸

<http://www.cnsa.gov.cn/n615708/n676979/n676983/n886611/66292.html>.