

China and Space Environment Protection: An Evaluation from an International Legal Perspective

*Xiaodan Wu**

Abstract

The outer space environment is significantly deteriorating due to the increasing amount of space debris. China now ranks among the world's most advanced countries in some important fields of space technologies and the impact of its space activities on space environment has logically been a concern. The Chinese government is becoming more and more aware of the importance of the safe and sustainable access to and use of outer space, and emphasizes that the issue of space debris is a big challenge to further expansion of space activities. During recent years, China has accelerated the process of translating the related international guidelines into domestic policy and law, mainly by the national action plans on space debris initiated in 2000, the 2005 Requirements of Space Debris Mitigation and the Provisional Regulation on Mitigation and Management of Space Debris, which entered into force in 2010. This article aims at evaluating whether China has fulfilled its international obligations in space environment protection based on an analysis of China's related attitude, national regimes and activities.

The issue of protection and preservation of the outer space environment has been widely recognized as a significant threat to the on-going expansion of human activities in outer space, especially the potential and actual risk caused by space debris.¹ Space debris poses a growing, indiscriminate and increasing risk to the secure access to space and all space assets. Furthermore, the problems

* Law School, Central University of Finance and Economics, Beijing, China: unimixiaodanwu@gmail.com.

1 Space debris is defined by the UN Committee on the Peaceful Uses of Outer Space (COPUOS) as all man-made 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 and 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. Report of the Scientific and Technical Subcommittee of COPUOS on the Work of Its Thirty-fourth Session, UN Doc. A/AC.105/672, 10 March 1997.

associated with space debris are a threat to Earth as a whole and have the potential to affect every country. Consequently, it is in the interests of the entire global community to establish and conform to international legal mechanisms to regulate and control activities contributing to the proliferation of space debris and mitigate the universally adverse effects that such debris might cause. Over the last half-century, China has made great strides in the exploration and utilization of outer space and now ranks among the world's most advanced countries in some important fields of space technologies. Logically, the impact of its space activities on space environment has become a concern. This article aims at performing a comprehensive evaluation of China's policy, regulations, standards and activities regarding space debris from an international legal perspective.

A. The International Rules for Space Environmental Protection

The existing five United Nations space treaties, establishing the basic principles for space exploration and utilization, do not directly deal with the issue of space environment protection. These space treaties provide a loose regime for space debris regulation absence of clear-cut and implementable legal rules, though some of their provisions could be utilized to regulate space debris to some extent. For instance, the Outer Space Treaty (OST) does not specifically address the issue of space debris. Article IX provides that States shall conduct all their activities in outer space with due regard to the corresponding interest of all other States Parties and shall adopt appropriate measures to avoid harmful contamination; and establishes consultation procedures where an activity or experiment planned by a State or its nationals would cause potentially harmful interference with the activities of another State. Obviously, environmental issues and the risks that might arise from the generation of space debris did not receive priority attention within the context of the development of international space law.

The developments during the last two decades show that there is a universal consensus among space operators that the creation of space debris and other irresponsible behavior in space can have negative implications for all space users. The growing awareness of the impact of space debris on the security of space asset has encouraged spacefaring state and other space actors to take steps to develop soft law regarding preventing and mitigation the production of new debris. In 1993, the Inter-Agency Space Debris Coordination Committee (IADC), as an international governmental forum composed of 11 space agencies, was founded in order to exchange information on space debris research activities between member space agencies, to facilitate opportunities for related research and to identify debris mitigation options.² The Scientific and Technical Subcommittee of the COPUOS began discussion of space debris issue in February 1994. In 2001, the COPUOS asked the IADC to develop a set of

² See <www.iadc-online.org>, last accessed on 21 August 2013.

international debris mitigation guidelines, which were proposed in October 2002, reflecting the existing practice as developed by a number of national and international organizations.³ The Guidelines require that members limit debris released during normal operations; minimize the potential for on-orbit break-ups; and dispose satellites after mission ends.

In 2007, a set of Space Debris Mitigation Guidelines based on the IADC work, but less technical and higher level, were adopted by the COPUOS and endorsed by the UN General Assembly. The COPUOS Guidelines is a set of voluntary guidelines outlining space debris mitigation measures for the planning, design, manufacture, and operational phases of spacecraft and launch vehicle and promoting international consensus on acceptable spacecraft operations so that outer space may be used in a sustainable way.⁴ The Guidelines call upon the States to limit debris released during normal operations; minimize the potential for breakups during operational phases; limit the probability of accidental collision in orbit; avoid intentional destruction and other harmful activities; minimize potential for post-mission breakups; limit the long-term presence of spacecraft and launch vehicle orbital stages in the low-Earth orbit region after the end of their mission; limit the long-term interference of spacecraft and launch vehicle orbital stages with the geosynchronous Earth orbit region after the end of their mission.

B. China's Attitude towards Space Environmental Protection

China's attitude towards space debris primarily embodies in its national policies and relevant activities in international forum.

Generally speaking, China's government is aware of the importance of the safe and sustainable access to and use of outer space, particularly near-earth orbits, and space debris would create a threat or danger to human activities in outer space. In accordance with the 2000 White Paper on Space Activities, one of the five basic principles for international cooperation is that necessary measures should be adopted to protect the space environment, particularly to mitigate space debris.⁵ The 2006 White Paper explicitly declared that one of the aims and principles of development is maintaining comprehensive, coordinated and sustainable development.⁶ This stand is further strengthened in its 2011 White

3 IADC Space Debris Mitigation Guidelines, IADC-02-01, 15 October 2002, p. iv.

4 UN Res. 62/217, 22 December 2007, see <www.unoosa.org/pdf/bst/COPUOS_SPACE_DEBRIS_MITIGATION_GUIDELINES.pdf>, last accessed on 21 August 2013.

5 See the section of International Cooperation of China's 2000 White Paper on Space Activities, available at <www.cnsa.gov.cn/n615709/n620681/n771967/69198.html>, last accessed on 16 August 2013.

6 See the section of international space exchange and cooperation of China's 2006 White Paper on Space Activities. Available at <www.cnsa.gov.cn/n615709/n620681/n771967/79970_1.html>, last visited on 16 August 2013.

Paper by highlighting orbital debris mitigation as a key priority for its space activities over the past five years and in the future.

At the international level, the China National Space Administration joined the IADC in 1995 and took an active part in discussion on the Space Debris Mitigation Guidelines. The Chinese government also supported the working methods defined by the COPUOS Space Debris Working Group and actively participated in the discussion on space debris mitigation guidelines in the COPUOS. Since 2008, Chinese government has advocated the idea of a harmonious outer space, stressing the need to harmonize the exploration and use of outer space with space environment with an eye toward the sustainable development of outer space.

In response to several debris-generating events during recent years, it is argued that there is an urgent need to strengthen international law regarding the sustainability of the space environment, particularly in respect of banning the use of weapons of force in outer space and the need for effective measure to curb the creation of space debris, mainly because voluntary guidelines are not universally or regularly followed and have proved to be insufficient when advanced technological proliferation and the expansion of space activities is accelerating; the potential risk of space weaponization and the on-going diversity of space actors is proceeding rapidly.⁷

China's standing about how to develop international rule in this regard are different in the two dimensions of space security: environmental and military, though they overlap to certain extent.

Firstly, the Chinese government advocates the common and differentiated responsibility of protecting space environment. It is of the view that the IADC and UN guidelines be implemented on voluntary basis due to the perceived cost and technological requirements. "Since space debris mitigation requires necessary technology and financial support, whereas space-faring countries are different in their levels of development, IADC guidelines is a document of a guiding nature which is to be followed by all space agencies in a voluntary manner".⁸ In other words, some countries, particularly developing countries, are not technically or financially capable of carrying out space debris mitigation work. The implicit logic is that the generation of debris attributes to the careless action of the United States and Russia in the early days of their space programs; and binding international law could be a way to limit the future capabilities of emerging powers in outer space.

Secondly, multilateral measures to prevent the weaponization of outer space have long been a cornerstone of China's official diplomatic space policy. Beijing believes that the most effective way to secure space assets would be an agree-

7 Space Security Index: 2012, p. 11, <www.spacesecurity.org>, last accessed on 15 August 2013.

8 Statement of China's Delegation to 526th Meeting of Committee on the Peaceful Uses of Outer Space, 8 June 2004, unedited transcript, COPUOS/T. 526.

ment of an international ban on weapons in space.⁹ China has actively argued for a treaty prohibiting the deployment of weapons in outer space since the 1980s at the Conference on Disarmament (CD). In February 2008, China and Russia formally submitted the draft “Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force against Outer Space Objects” (PPWT) to the CD.¹⁰ It proposed three obligations: not to place or deploy any weapons in orbit or on celestial bodies near the Earth; not to use or threaten to use force against space objects; and not to assist and not encourage other States or international organizations to participate in such activities. The PPWT proposal was objected by some states and non-governmental groups whose primary concern is protecting the space environment because it does not explicitly ban the testing or possession of debris-generating anti-satellites weapons based in any environment besides space. As a response, China recognized a provision banning anti-satellites tests as a possible amendment to the text of the PPWT and is open to proposals establishing worldwide ban on anti-satellites weapons.¹¹ This further verified China’s intention in the negotiation of an international treaty on prevention of an arms race in outer space (PAROS). Thirdly, the possibility of China’s signing the EU Code of Conduct for Outer Space appears slim, despite of its soft law nature. The Council of the European Union endorsed the draft Code of Conduct in 2008 and revised in 2010 and 2012, as a means to achieve enhanced safety and security in outer space through the development and implementation of transparency and confidence-building measures (TCBMs).¹² The Chinese government believes that TCBMs are important efforts to prevent an arms race in outer space,¹³ but questioned the appropriateness, legitimacy and necessity of doing so in the EU framework.

9 Closing Statement by H. E. Ambassador Hu Xiaodi at the International Conference on “Safeguarding Space Security: Prevention of an Arms Race in Outer Space”, 21-22 March 2005, Palais des Nations, Geneva.

10 See Letter from Permanent Representative of the Russian Federation and the Permanent Representative of China Addressed to the Secretary – General of the Conference on Disarmament, See CD/1839, 29 February 2008.

11 Letter from the Permanent Representative of the Russian Federation and the Permanent Representative of China to the Conference on Disarmament, CD/1818, 7 March 2007, p. 23, para. 158. Zero-weapons Outer Space: Foundation for a Safer Space Environment, presentation by Chinese Delegation at the UNIDIR Conference on Space Security 2009, available at <www.mfa.gov.cn/eng/wjbj/zjjg/jks/kjfywj/t575050.htm>, last accessed on 2 August 2012.

12 For the text of the original and the revised versions of the EU Draft Code of Conduct for Outer Space, <<http://register.consilium.europa.eu/pdf/en/08/st17/st17175.en08.pdf>>, <www.consilium.europa.eu/uedocs/cmsUpload/st14455.en10.pdf>, and <www.consilium.europa.eu/media/1696642/12_06_05_coc_space_eu_revised_draft_working_document.pdf>, last accessed on 22 August 2013.

13 Statement by h. E. Mr. Wang Qun, Ambassador for Disarmament Affair of China at the general debate of the first committee of the 66th session of UNGA, <www.fmprc.gov.cn/eng/wjbj/zjjg/jks/jkxw/t865572.htm>, last accessed on 22 August 2013.

During the multilateral negotiation in Kiev on 16th and 17th May 2013, together with Russia, Chinese delegation insisted that the topic of this document overlapped with the official ones in the COPUOS and the CD. Moreover, the countries besides the EU Member States, including China, have not been insufficiently consulted in the drafting process of the instrument. China insisted that a legally binding treaty, as the PPWT, outlawing the weaponization of space would be more suitable since this is primary threat to space security instead of space debris or collision.¹⁴

C. China's National Mechanism for Debris Mitigation

China has established a national mechanism governing space debris mitigation through the nomination of government supervisory authority, the involvement of academia and industry and the development of new legislative norms, instructions, standards and frameworks. The Commission of Science, Technology and Industry of National Defense (COSTIND), the State Administration of Science, Technology and Industry for National Defense of Ministry of Industry and Information Technology (AOSTIND-MIIT) since 2008, is in charge of administering mitigation of space debris, relevant capacity building and coordinating fulfillment of requirements by the UN and IADC Guidelines.

In accordance with article 6(b) and (d) of 2002 Interim Provisions on Licenses for Civil Space Launching Projects, the applicants should provide documents proving the related activities conform to national laws and regulations on environmental protection; and the safety design report should contain the information on how to avoid pollution and space debris. So, there exists the supervisory mechanism for the mitigation of and protection against space debris during development and operation of spacecraft and launching vehicles as well as post-mission disposal.

The COSTIND issued Requirements of Space Debris Mitigation (QJ3221-2005) on 11 April 2005, which entered into force on 1 July 2005.¹⁵ This document set down standards for space industry in limiting the production of debris for spacecraft and the mitigation measures for the planning, design, launch, operational and post-mission disposal phases of spacecraft and launch vehicles that will be injected in Earth orbit. Accordingly, each space program should have a debris mitigation plan and a supervisor. The basic requirements include avoiding intentional production of debris during normal operation; avoiding break-ups in orbit; remove the spacecraft out of protection zone in disposal phase; and implementing debris mitigation action plan. These requirements conform to the UN COPUOS and IADC guidelines. In addition, the drafting of this document indicated that China has established a systematic standardiza-

14 Zhenjun Zhang, Multilateral Negotiation on the EU Code of Conduct for Space Activities, in 31 Newsletter of Space Law, China Institute of Space Law, 2013, p. 50.

15 See <www.cnsa.gov.cn/n615708/n676979/n676983/n893604/appendix/2008529151748.pdf>, last accessed on 16 August 2013.

tion structure of space debris, which involves space industry (China Aerospace Science and Technology Corporation), research institutions (China Academy of Aerospace Standardization and Product Assurance and National Space Science Center of China Academy of Science) and governmental organs (China Space Agency and COSTIND).

AOSTIND issued a Provisional Regulation on Mitigation and Management of Space Debris, which was officially put into practice on 1st January 2010.¹⁶ This Provisional Regulation conforms to the requirements of the international guidelines and was viewed as a commitment to the international community as a responsible space-faring nation.¹⁷ The purpose is to effectively control the generation of space debris and prevent the damaged caused thereby and fulfill China's international obligations. It establishes the coordination, emergency management, and surveillance mechanisms. It provides for the general requirements, responsibilities and liabilities of space actors.

D. China's Related Activities

The Chinese government is making effort to mitigate the production of new debris through compliance with international guidelines. Its research into space environment monitoring and forecasting can be traced back to the 1980s and has steadily pushed forward its work on space debris mitigation. Now it has established three system handling the issue of space debris: surveillance and alarming; spacecraft protection and space environmental protection.¹⁸ China initiated its first Space Debris Action Plan in 2001 for the 10th Five-Year Plan period (2001-2005), which called for establishing an initial observing capacity; developing a database on space debris environment and dynamics; developing and putting into service an international level risk assessment and emergency avoidance expert system; mitigating space debris generation; and draw up de-orbit post mission disposal for GEO and LEO satellites.¹⁹ The 11th Five-year Plan for Space Development, issued in 2007, set down the goals of implementing space debris prediction project; further research on prediction, collision avoidance and mitigation and developing shielding and survivability measures for spacecraft.

16 See the information center of State Administration of Science, Technology and Industry for National Defense, <www.cic.gov.cn>, last accessed on 16 November 2011.

17 See interview of the Vice President of China Academy of Space Technology, <http://news.xinhuanet.com/society/2010-11/30/c_12832590.htm>, last accessed on 16 November 2011.

18 See <www.gov.cn/jrzq/2010-11/30/content_1756576.htm>, last accessed on 21 August 2013.

19 China Science and Technology Newsletter, No. 340, the Ministry of Science and Technology, <www.most.gov.cn/eng/newsletters/2003/200411/t20041130_17740.htm>, last accessed on 22 August 2013.

Specifically, China attached increasing importance to space surveillance and has grasped the rudimentary technologies of warning debris collision so as to evaluate the orbital risks of spacecraft and established a debris “alarm system” to warn of potential collisions to secure the safety of manned spaceflight and launch of satellite. The failure of the Long-March 4 Rocket caused two significant debris generation events in 1999 and 2000 and created more than 300 trackable debris pieces. Developing the new generation of nontoxic and pollution-free carrier rockets was once been set as a major task.²⁰ Chinese Academy of Science established a Space Object and Debris Monitoring and Research to developing a debris warning system for China’s space assets in Nanjing in 2005. China developed “technologies for monitoring space debris and pre-warning of collision, and begin monitoring space debris and small near-Earth celestial bodies and collision pre-warning work.”²¹ Several hypervelocity impact labs devoted to space debris have been established in research institutions, such as Harbin Institute of Technology, the Fifth Academy of the National Defense Ministry. To support its space program, China has upgraded its Xi’an Satellite Monitoring Center, the primary control center for China’s network of 20 ground monitoring stations and six satellite tracking ships, to increase orbit determination and capabilities to track domestic and foreign satellites. On 3 October 2009, the China Aerospace Science and Technology Corporation announced that it had conducted a collision avoidance maneuver for a high-value Chinese spacecraft. This was reportedly the first time such a maneuver had been conducted by a Chinese satellite. In recent years, removing orbital debris is regarded as a new phase of space environment protection and China seemed to making scientific and technological advance by moving a few aging GEO satellites out of orbit.²²

The test of launching a ballistic missile to destroy the non-functional weather satellite Fengyun-1 in 2007 made China the focus among the international space community. Undoubtedly, this test ran against the OST provisions and posed serious danger to space assets and undermine the good reputation that the Chinese leadership had been steadily during the last decades. This test violated Article IX of the Outer Space Treaty, in which signatory nation are obliged not to interfere with the space operations of others and to consult when national action might lead to such interference. This reckless action raised serious questions about Beijing’s credibility as a responsible space actor and its longstanding efforts to push forward a treaty on PAROS.²³ A probably fair

20 The section of Development Targets and Major Tasks for the Next Five Years. of China’s 2006 White Paper on Space Activities. Available at <www.cnsa.gov.cn/n615709/n620681/n771967/79970_1.html>, last visited on 16 August 2013.

21 Ibid.

22 China’s Space Activities in 2011, Xinhua, 29 December 2011, at 6. Available at <http://news.xinhuanet.com/english/china/2011-12/29/c_131333479.htm>, last accessed on 15 August 2013.

23 T. Hitchens, “U.S. – Sino Relations in Space: From “War of Words” to Cold War in Space?”, in 3 *China Security*, 2007, pp. 13-14. T. Hitches, “Saving Space: Threat

explanation is that China's leaders might have underestimated the intensity of international reaction and miscalculated the potential impacts of so much debris on all nations' satellites,²⁴ and that the lawyers were not incorporated into the decision-making process to take into consideration of China's international obligations.

E. Concluding Remarks

Though actively advocating an international treaty on PAROS, an international agreement changing the ad hoc and non-binding nature of current guidelines for managing the mitigation of debris seems unacceptable for China based on the argument of differential sharing of responsibility for space environment. But it is not fair to declare China is taking advantage of its status as a developing country since it is trying to be a responsible spacefaring state by making effort to mitigate debris in recent years. The preference for the non-binding force of the international guidelines can be deemed as a pragmatic way to protect the interests of developing countries in space based on their financial and technological capability.

Moreover, awareness of the space debris problem has grown considerably and efforts to mitigate the production of new debris through compliance with international guidelines have been regarded as more important. China has accelerated the process of translating international agreements into domestic policy and law and is gradually establishing space debris regulation mechanism, including the standards for mitigation, spacecraft protection, surveillance and warning. The bottom line is that China continues to conceive of its interest in space and wants to be seen as a responsible member of the family of spacefaring nations.

However, China should be more active and responsible in the prevention, mitigation and removal of debris and take an international lead in developing the consensus for adopting mitigation measures to protect uses of the space environment, since its space programs are expected to grow steadily in coming years and China is gradually taking a leading role in the international community. At the national level, the transparency of China's debris regulations and standards need to be improved.

Proliferation and Mitigation", available at <http://icnnd.org/Documents/Hitchens_Saving_Space.pdf>, last accessed on 13 December 2012.

24 Statement of Mr. William B. Scott, Former Bureau Chief, Aviation Week & Space Technology, in *China's Proliferation Practices, and the Development of Its Cyber and Space Warfare Capabilities*, U.S. – China Economic and Security Review Commission, 20 May 2008, p. 23.