Active Debris Removal: Potential Legal Barriers and Possible Ways Forward

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The space environment is unique. Natural decay of debris therein is much slower than pollutants in other environments, so that removal is difficult and expensive. Despite the voluntary implementation of mitigation guidelines, the amount of debris has surged in the last two decades due to increase and diversification of space actors, and the continuing militarization of space. Active Debris Removal has thus become a promising responsive scenario. This article examines key legal barriers to the implementation of removal, such as the lack of legal definition of space debris, ambiguities surrounding the jurisdiction and control over space debris, liability for possible damages caused in removal, and implications for space arms control. It further proposes that more comprehensive registration of space objects, an international catalogue of space debris and an international fund for removal should be promoted. Also, international cooperation should be enhanced to cope with space debris, while space arms control should be strengthened.

Keywords
Active Debris Removal, Debris Mitigation, Registration, Dual-Use

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I. Introduction: The Need for Active Debris Removal

Human exploration and use of outer space has not only made enormous contributions to the welfare of society, but has also resulted in a large number of debris in orbit. The US Space Surveillance Network (“SSN”) currently tracks around 23,000 objects that are larger than 10cm in diameter. Most of these tracked objects are debris residing in the busy Low Earth Orbits (“LEO”), i.e. orbits within 2,000 km of the Earth’s surface. Their high travel speed makes space debris a threat to active spacecraft and human space missions. Their ‘natural decay’ relies on the atmospheric drag, and ranges from years to centuries depending on the altitude they orbit at.

Space debris were not a major environmental concern in the early stage of space exploration and use. The treaties concluded then thus did not prescribe substantial obligations of environmental protection upon States. The most relevant limitations in this regard are perhaps the requirements of paying ‘due regard,’ avoiding ‘harmful contamination,’ and conducting ‘consultations’ as found in Article IX of the Outer Space Treaty. In the subsequent practice of States Parties, however, the creation of space debris has been seldom regarded as a violation of the ‘due regard’ principle. This practice, albeit tacit, has the effect of establishing an agreement of the parties on a strict interpretation of the principle. Although space debris were arguably a new form of such ‘harmful contamination’ of outer space, States Parties were only obliged to ‘avoid’ it and adopt ‘appropriate’ measures ‘where necessary.’ These vague and subjective terms make it difficult to assess whether there is a violation. Provisions relating to consultations had never been directly used and invoked.

3 Id.
5 Outer Space Treaty art. IX.
6 On China’s fragmentation of its FY-1C in 2007, e.g., protests by other States were more concerned with the lack of consultations. For details, see infra note 11.
8 S. Marchisio, Article IX, in COLOGNE COMMENTARY ON SPACE LAW (vol.1) 177 (S. Hobe et al. eds., 2009).
9 Outer Space Treaty art. IX.
10 L. Viikari, The environmental element in space law: assessing the present and charting the future 61 (2008).
11 R. Jakhu, Legal Issues of Satellite Telecommunications, the Geostationary Orbit, and Space Debris, 5 INT’L J. SPACE