

Space Debris – Emerging Challenge, Common Concern and Shared Responsibility: Legal Considerations and Directions towards a Secure and Sustainable Space Environment

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Space Debris is one of the topics that over many consecutive years have been raised within the UN COPUOS. In addition to that, the environmental concerns have been reflected in the very first international space law documents what is not the case with many other space-related implications. Relevant to space debris problems have been further elaborated in separate documents being shaped mostly as recommendations rather than binding rules. A variety of international / regional organisations and national space agencies undertook efforts in designing more or less adequate legal regime for space debris regulation however none of them has been internationally recognized as a reference. Despite numerous efforts in setting respective regime we do observe the lack of secured space environment among other due to the absence of a comprehensive space debris mitigation policy and mandatory rules to be respected by all operators. The latter causes uncertainty, danger and risk as to the physical integrity of the space object, continuity of services it provides, economic benefits expected from those services, secure life of human in space as well as to the guarantee of sustainability in the outer space along with keeping its initial environmental qualities for future space activities. Thus, this paper will investigate existing commitments, if any, of space actors with regard to space debris removal and imposed level of liability / responsibility in case of default. The intercompatibility and complementarity of the legal documents pertinent to space debris will be examined. Additionally it will draw the distinction between non-operational space objects that however could continue their useful exploitation if getting on-orbit servicing and those uncontrolled fragments that could not constitute any utility. The perspectives for bringing space debris issue to the level of international common concern making it consequently the shared responsibility of all stakeholders will be determined.

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Introduction

Environmental law is quite new however its applicability to the outer space and space activities is even more recent. The understanding of its extension also to the space environment was not immediate. It took a delay from the beginning of the space era when the doctrine started to consider this point referring to the provision, incorporated in the international space law documents, stipulating that the international law as such extends also to the activities occurring in space. The main areas for environmental protection from the negative impact of the anthropogenic space activities are: 1) the space environment and its natural space objects (the Moon and other celestial bodies); 2) life, health and secure stay of human in space; 3) the Earth and near-Earth environment. As regards the space environment per se the emphasis should be done both on its pollution and contamination. For these purposes the criteria of the due quality of the environment, guaranteed by states and secured by different legal instruments should be set.

Over the last decades the potential of space activities progressively increased. In the meantime, there are more and more challenges that emerge in their context. One of the most important is space debris.

Rationale

Even though there is no legally enshrined definition of what stands for space debris, the space community still considers this category of objects as those that are not operational any longer in a way they have been initially programmed thus contradicting their primary mission. If at the very beginning under the space debris have been implied mostly fragments of space objects, non-operational objects etc., nowadays there is a view that small nano- and microsattelites should be also treated as space debris since posing a threat to the big spacecrafts that ensure the provision of vital space services. Another aspect that should be mentioned is the anthropogenic nature of those elements. Despite the fact that currently in space there is a variety of objects constituting threat to space activities, mitigation of the man-made space debris could be controlled already at the initial pre-launch stage when being designed and manufactured. As an emerging concern could be seen the absence of a legally binding obligation imposed on operators to remediate the space object in a safe manner. Currently under the existing space law the one-sided relationship is established – the states are given the right of a free access to space but not an obligation to take their object back. Despite the fact that states keep the jurisdiction and control over their objects, still we do observe the disbalance in their rights and obligations with regard to space environment and interests of future generations when undertaking space activities. This attitude creates the situation where space environment could be compared to a basket to which numerous balls are thrown by different players in an uncoordinated way. Every player, in our case the space actor, is playing its own game according to private interests. At a certain point the basket will be full and therefore unable to store further

balls. Same as a limited in size basket, the economically viable, in terms of space services, orbital capacities and slots are also rare and limited. In the context of space activities the success is primarily associated with a successful launch and not with a removal of space debris. Moreover the satellite's launch is mostly one-way action, from Earth into space. There is no standard for a responsible launch service provider, therefore putting the satellites into orbit the space operators have an option to act responsibly or not. In this context appears another lacuna - the lack of imposed on space actors obligation to coordinate their activities on a strategic level. The removal of the non-functional space objects is the prerogative of only launching states that keep jurisdiction over them. Deriving from this, the question is in which way the states can influence the behavior of other states?

To present there is no joint funding mechanism for executing the cleaning function of space environment. As a step forward could be seen the approach when all launching states will establish the fund for securing space environment including the financing of technologies development for debris remediation. Here it is also worth mentioning that not all countries sending space objects into space possess technologies / expertise / willingness / budget to peacefully remove space debris from orbit. Thus the states that are not in a capacity by their own means to safely remove belonging to them space debris or if it is not feasible to identify the liaison of the object with a certain state then the operators of this fund thanks to the efforts of states that possess such the capacities will assist them.

For the time being the regulation of space debris is non-comprehensive and as have already been mentioned is mostly voluntary. The international space law treaties as required by their legal nature constitute a general framework for space activities. However specific regulation of space debris is found only in the documents of a non-binding nature or in the on-going legal initiatives. In this context two major blocks are observed: the mitigation guidelines and the code of conducts. To them in particular refer the following:

1. IADC Space Debris Mitigation Guidelines;
2. COPUOS Space Debris Mitigation Guidelines;
3. Draft European Code of Conduct for Outer Space Activities (replaced by the International Code of Conduct);
4. Draft International Code of Conduct for Outer Space Activities.

There is also a set of documents that are indirectly relevant to space debris issue, namely the working documents of the Group of Governmental Experts on Outer Space Transparency and Confidence-Building Measures and of the UN Long-Term Sustainability of Outer Space Activities Working Group.

Space debris is a global concern that requires an international cooperative action. As a response to this emerging concern there are certain categories of ideas put forward:

1. Situational Space Awareness (that includes monitoring of space environment, control over space object and exchange of data on space debris);
2. Space Traffic Management (coordination of space activities, notification and warning for purposes of collision avoidance);
3. Active Debris Removal.

These actions are undertaken by different actors depending on their inherent interest:

- Risk of bearing responsibility / liability;
- Economic interest;
- Scientific interest.

Legal scope does not reflect all technical developments that focus on space debris removal. In addition to that, there is a strong legal relationship between the space object (also the non-operational) and the launching state (that keeps jurisdiction, control, ownership). Under the existing legal provisions we are allowed to monitor and track space debris, to attempt avoiding the collisions and to remove only those debris that belong to us. However we are not entitled to remove space debris which parts permit (through registration and designation) to identify the affiliation of the object. When considering space debris issue from the legal perspective there are many questions that remain open and on our view require further analysis:

- How could the free access to space of present and future generations be secured taking into account the increasing space debris concern?
- How do we bring all states to a certain level of responsibility?
- Whether the coordinating mechanism of launches is needed? (pre-launch and not a post-launch notification, international scheduling of launches and authorisation provision)?
- Prior authorisation is needed for most of the high-risk activities, including transport activities. Do we need to establish the same with regard to space activities?
- How to impose on states the obligation to remove their space debris if the voluntary rules fail to be efficient?
- How do we bring the legal efforts in line with technical developments?
- Do we need to establish a cooperative effort (technology/expertise/budget) for space debris removal?

Conclusions

1. We should move towards the elaboration and adoption of a legally binding document that for mid-run could be a thematic treaty (or part of the treaty focused on the secure space environment) and for a long-run – the constituent part of the comprehensive outer space convention;
2. The existing international law allows only the launching state or operator to touch the objects placed in orbit, therefore most of the space programmes on the active space debris removal are for the time being illegal;
3. Space debris mitigation is a common concern and therefore a shared responsibility of all States; it is not feasible to address this issue with efforts of only few space-faring countries;
4. Solving this problem now is also a part of commitment with regard to the inherent rights and interests of future generations to access and use the outer space;

5. The supervisory / coordinating authority might be needed to authorise the activities, coordinate the traffic in space and removal of space debris. This authority will require a mandate from states as well as conferred to it competencies.