

OUTER SPACE TREATY AS A FRAMEWORK FOR THE REGULATION OF SPACE DEBRIS

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The problem of reducing space debris with the help of legal instruments belongs to the most discussed issues since the end of the 80ties. These discussions led to the elaboration of the Draft of the International Law Association for a Convention on Space Debris submitted to the 66 Conference of the ILA in Buenos Aires in August 1994, the provisions of which seem to constitute a useful starting point for further regulatory activities. The basis of this document are the pertinent provisions of the Outer Space Treaty together with the principles of the 1972 Liability Convention.

This paper deals with the question whether and under which conditions the international instruments already in force, primarily the Outer Space Treaty itself, have the capacity to

influence the behavior of the space providers in respect to the space debris or whether a supplementary set of rules is necessary. The analysis of this question leads to the conclusion that, with regard to the specific character of space debris, the already valid rules seem to be too general to be able to cope effectively with this phenomenon.

I. Introduction

Celebrating the Thirtieth Anniversary of the Outer Space Treaty of 1967 (OST) the UN Committee on Peaceful Uses of Outer Space (COPUOS) reviewed the scientific and technical as well as the legal aspects of the exploration and the peaceful uses of outer space, space debris being among the highlighted topics.

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One of the questions connected with this phenomenon was, to what extent the OST can cover very specialised items not envisaged in the years of its elaboration and how intensive is the necessity of its amendment, in order to cope with the new conditions: the growing quantity of debris on one side and the improving technical possibilities of tracking and managing space debris on the other side.

The Czech delegation to the Legal Sub-Committee of the COPUOS put on its 1996 session as an unofficial background note a set of questions, the answer to which could help to catalogue the main groups of legal problems connected with space debris.¹ The following problems have been defined:

- Does the definition of „space object“ as contained in instruments of space law cover space debris?
- Do provisions of the 1967 OST concerning the avoidance of harmful contamination of outer space and adverse changes in the environment of the Earth apply to the problem of space debris?
- Should the protection of ownership of space objects, and their component parts, also be extended to space debris?
- Should liability for damage caused to a space object and/or its crew by space debris depend on the proof of fault as in the case of a collision of two space objects?²

Notwithstanding the changing political and technological approaches and constellations, the respective conclusions could help to measure the extent of flexibility of the OST for this particular area of environmental protection and to signalise the urgency of a legislative action. As a model of an already formulated solution of the problem of space debris, the 1984 International Law Association Draft „Buenos Aires International Instrument on the Protection of the Environment from Damage Caused by Space Debris“ may be mentioned³.

II. The term „space debris“

De lege lata, the question whether the definition of „space object“, as contained in the valid instruments of space law, covers space debris, does not depend merely on the fact what should be - in the scientific aspects - understood under the terms „debris“. It depends in the same way on the interpretation of the category of „space object“ under the international law in force. Because of the fact that the OST was a „pragmatic“ instrument corresponding to the political and technological conditions of the period in which it has been drafted, there was no necessity to elaborate such definition. In order to determine precisely the scope of liability for damage to another State Party or to its natural or juridical persons, the term „object“ has been included

into Art. VII OST, differentiating between „objects launched into outer space“ and „component parts“ of these object.

The provision of Art. 1 of the 1972 Convention on International Liability for Damage Caused by Space Objects describes a „space object“ as including „component parts of these object as well as its launch vehicle and parts thereof.“ *Mutatis mutandis*, the 1975 Convention on Registration of Objects Launched into Outer Space stipulates in Art. 1b that the term „space object“ includes component parts of a space object as well as its launch vehicle and parts thereof.

The partial „in circle“ definition of space objects together with many unsolved problems concerning the regime of aero-space objects did not bring any precise line between the category of space objects and another objects which exist in outer space. It is is e.g. unclear whether a permanent installation affixed to a celestial body constitutes a space object. Another open question is whether an object must be launched into outer space to be considered a space object within the terms of the OST or whether it is sufficient that it can be assembled in outer space? Or: Is the space shuttle a space object?⁴ However, the repeatedly underlined fact that the term „space objects“ include in the valid international space instruments its component parts, should permit to

include the „space debris“ in the category of the „space objects“ and their - however often unclear - regime under present international law.

De lege ferenda, in the course of many years in which the legal aspects of space debris have been under discussion, many scientific definitions have been elaborated.

The 1984 Buenos Aires Document defined „space debris“ as man made objects in outer space, other than active or otherwise useful satellites, when no change can reasonably be expected in these conditions in the foreseeable future (Art. 1 c). Based upon the same approach that space debris fall under the notion of „space objects“ and notwithstanding that the 1984 definition contains terms which could theoretically lead to certain misinterpretations, the intent of the drafters of the document is clear.

The same can be said about the definition prepared by the Scientific and Technical Sub-Committee of the COPUOS in 1996, which stipulates that space debris are all man made objects, including their fragments and parts, whether their owners can be identified or not, in Earth orbit or after re-entering the dense layers of the atmosphere that are non-functional with no reasonable expectation of their being able to assume their intended functions or any other functions for which they are or can be authorised. However, the uncertainty

concerning the „reasonable expectation“ and the institution which should define such a constellation persists.

It is well known, however, that the success of a legal definition does not depend only on the scientific accuracy of the described phenomenon; it should primarily serve as an expression of the consensus of the future parties to the legal document as to the scope of the regulation in question. If there exists a strong controversy among the authors of the document in preparation about the width or depth of the proposed regulation, even the best scientific definition cannot bring any realistic results.

III. Harmful Contamination

De lege lata, one of the approaches to solve pending legal problems connected with space debris was to introduce their regime under the provisions of OST concerning the harmful contamination and adverse changes in the environment of the Earth⁵. The particular provision of the Art. IX OST reads as follows: „States Parties of the Treaty shall pursue studies of outer space, including the Moon and other celestial bodies, and conduct exploration of them so as to avoid their harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of the extra-terrestrial matter and, when necessary, shall adopt

appropriate measures for this purpose.“

It is obvious that this provision of Art. IX OST connects the legal consequences in case of harmful contamination with their source such as „studies of outer space“ or its „exploration“, excluding its exploitation e.g. in the form of telecommunication satellites. However, the sphere of space telecommunications is one of the most important fields in which the non-functioning space objects can pose serious problems. Because of the pending re-structuralisation of the ITU - notification procedures concerning the use of the slots on the geostationary orbit, the question even arises at present whether there is a possibility of a co-ordinated approach of both regulatory systems, thus avoiding overlapping activities and the misspenditure of scarce resources.

As far as „adverse changes in the environment“ are concerned, the application of Art. IX OST depends on the introduction of the „extra-terrestrial matter“ in the Earth environment. The problem can be, therefore, reduced to the question whether space debris can be included into the category of „extraterrestrial matter“.

Theoretically, both possibilities exist. In practice, however, the real effect of inserting space debris into the category of „extra-terrestrial matter“ should be analysed carefully. In the affirmative case, Art. IX

stipulates the following consequences: The State pursuing studies and exploration of outer space is obliged to do so in a manner avoiding such negative effects; if necessary, it shall take „appropriate measures“ for this purpose. Thus, it seems so that the positive effect of including space debris into the category of „extraterrestrial matter“ is not very considerable.

The second provision of Art. IX OST concerning harmful effects of space activities deals with „harmful interference with activities of other States Parties in the peaceful exploration and use of outer space“. Without any doubt, space debris are in a position to cause such a „harmful interference“. The consequence of this fact would be the duty of a State Party „which has a reason to believe that an activity or experiment planned by it or by its nationals in outer space would cause potentially harmful interference with activities of other State Parties in the peaceful exploration and use of outer space“ to undertake consultations before proceeding with any such activity or experiment. The problem of the applicability of this provision is, however, that the existence of space debris can hardly be described as a part of a „planned“ activity or experiment. The practical impact of this provision on the legal regime of space debris seems to be, therefore, quite limited indeed.

The effect of the third „harmful contamination“ provision of the OST has already been diminished in the period of elaboration of the OST: Under this part of Art. IX OST, „a State Party to the Treaty which has a reason to believe that an activity or experiment planned by another State Party in Outer Space“ ...„would cause potentially harmful interference with activities in peaceful exploration and use of outer space“...„may request consultation concerning the activity or experiment.“ The hypothesis of this provision seems to be applicable to the problem of space debris, because it includes not only exploration, but also exploitation of Outer Space. On the other side, as in the previous case, it concerns only the activities which are only „planned“ by the States Parties and, therefore, does not solve the question of already existing forms of exploitation. The effect of this rule is, however, reduced since it does not provide for an obligation of the other State Party to enter into the consultation.

The most important rule of Art. IX which is applicable to various aspects of the space debris problems, is the general provision under which „in the exploration and use of Outer Space...States Parties...shall conduct all their activities in outer space...with due regard to the corresponding interests of all other States Parties to the Treaty“. This rule fully justifies the demand of

other States parties to the OST to keep outer space free of space debris for further „exploration and use of outer space“.

De lege ferenda, the proposed concepts offer to fill the existing gaps of Art. IX by formulating more precise rules concerning especially the duty to cooperate to protect the environment and the obligation to enter into consultation in case of danger caused by space debris: Art. 3 of the 1994 Buenos Aires document stipulates a general obligation of states to cooperate to protect the environment and to take appropriate measures to prevent, reduce, and control any damage or significant risk arising from activities under their jurisdiction which are likely to produce space debris. In Art. 4 of this draft, the obligation of States and international organisations to hold consultations in case of risk to the environment from space debris is further expressed, together with the right of these parties to request consultations in case of such a risk. The refusal to hold consultations, or their breaking up without justification, shall be interpreted as bad faith. If Art. IX should be taken as a basis for the regulation of the consequences of space debris, this methodological approach is surely appropriate.

IV. Should the protection of ownership of space objects, and their component parts, also be extended to space debris?

De lege lata, in te Art. VIII OST the principle was laid down according to which „a State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such an object...while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the earth.“

The interpretation of „space debris“ as an sub-category of space objects or as their component parts does not seem to allow any other conclusion than that the principle of permanent ownership of space objects extends also to space debris. This approach, emphasizing the link between the launching State or State of registry and the not-functioning space object, seems to be strenghtened by the following part of article VIII OST⁶: Even „such (space, MH.) objects or their component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.“

The practical consequence of this conclusion is that even the space object that has not been functioning for a long time cannot be removed from

orbit without the consent of the state of registry.

This approach of the OST matches, however, to the relatively large objects, the state of registry of which can be easily identified⁷. In despite of the scientific progress, it seems to be unsuitable for the regime of relatively small particles the trajectory of which can be observed, but the „owner“ of which is hardly to be identified.

De lege ferenda, a new regulation must draw the line between the objects the regime of which respects the provisions of Art. VIII OST and those, which should be - by agreement - be excluded from the protection of ownership and can be removed from the orbits without consent of the „owner“. The Buenos Aires International Instrument does not approach this dilemma; its „centre of gravity“ lays in its catalogue of co-operation provisions and its solution of international liability issues.

V. Should liability for damage caused to a space object and/or its crew by space debris depend on the proof of fault as in the case of a collision of two space objects?

Art. VII OST reads as follows: „Each State Party to the Treaty that launches or procures the launching of an object into outer space, ...and each State from whose territory or facility an object is launched, is

internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the earth, in air or in outer space...“. This provision has been extended by the relevant provisions of the Convention on International Liability for Damage Caused by Space Objects of 1972 (Liability Convention)⁸.

The *de lege lata* liability regime established by the Liability Convention may be divided into four distinct classifications: absolute liability, fault liability, joint and several liability, and exoneration from liability. In case space debris causes damage „...on the surface of the earth or to aircraft in flight“, an absolute liability of the launching State occurs, without necessity to prove fault or negligence (art. II of the Liability Convention).

This regime is limited, however, to land, water and air space. In the event of damage being caused elsewhere than on the surface of the earth to a space object of another launching State or to persons or property on board such a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of the persons for whom it is responsible (Art. III of the Liability Convention). The central term of this provision is the notion of „fault“, the attributes of which being not defined in the Convention. Traditio-

nally, fault liability comes into effect when there is „a failure to exercise the degree of prudence considered reasonable under the circumstances.⁹“ One of the problems connected with the application of this rule is to determine when a negligence occurs. The decision how to determine the fault will have to be settled either through negotiations or by a decision of a claims commission¹⁰.

This regime applies, however, only to the cases in which the liable State is known. Concerning space debris, this situation does not occur so often: more frequently the damage will be caused by particles the owner of which remains unidentifiable. For such a case, the construction of art. III of the Liability Convention does not suit.

For both reasons, the lack of precise criteria enabling to determine the fault of the launching State, as well as the specificity of many space debris, the concept of liability based on „fault“ does not seem appropriate for regulating space debris.

De lege ferenda, the Buenos Aires International Instrument provides in its article 8 that „each State or international organisation ...that launches or procures the launching of a space object is internationally liable for damage arising therefrom to another State, persons or objects, or international organisation party to this instrument as a consequence of space debris produced by such any object“.

This approach enables to compensate damages caused by space debris of known launching States. In order not to deprive a damaged State from any compensation in case the launching State is unknown, the idea of a special fund arose¹¹ which would compensate victims of such damage, each launching State contributing proportionally according to the number of launches it provides. This idea seems to be an appropriate measure to cope with this problem and its future formulation in precise legal terms would be a constructive approach how to regulate the legal consequences of the damages occurred.

VI. Conclusion

The crucial issue of the foregoing analysis was the question to which extent the OST is able to regulate the specific issue of the legal regime of space debris.

The response is twofold: It is, but only to some extent. No doubt concerning the applicability of its provisions arises in the case of damage caused by relatively large objects the launching State of which is identifiable, although the principle of fault liability could be discussed. The rule of Art. IX OST under which the States Parties shall conduct their activities in outer space with due regard to the corresponding interests of all other States Parties is a very important

element of this legal framework.

The phenomenon of the damage caused by particles the provider of which remains unknown does not seem to be specifically regulated. In order not to deprive a damaged State from any compensation, the idea of a special fund compensating victims of such damage appears as an appropriate measure to cope with this problem; its formulation in precise legal terms would represent a constructive approach how to contribute to the progress in this field.

Proceedings of the XI. Colloquium on the Law of Outer Space, (1968), p.236 et seq.

¹⁰ See Dimitri Maniatis, *supra* note 4, p. 33 et seq.

¹¹ H.A. Baker, *Liability for Damage Caused in Outer Space by Space Refuse*, *Annals of Air and Space Law* (1988), pp. 183-192.

¹ A/AC.105/639, 11 April 1996, Annex E.

² See Lubos Perek, *Space debris: Discussion in the United Nations in 1996*, IISL-96-IISL-4.08.

³ See: Karl-Heinz-Böckstiegel, *The Draft of the International Law Association for a Convention on Space Debris*, IISL-95-IISL.2.0.3.; *Id.* *ILA Draft Convention on Space Debris*, *ZLW* 1 (1995), pp. 29-34.

⁴ See: Dimitri Maniatis, *The Law governing Liability for Damage Caused by Space Objects: From State Responsibility to Private Liability*. In: *Annals of Air and Space Law* (1997), p.380.

⁵ Cf. Manfred Hintz, *Weltraumrechtlicher Umweltschutz im völkerrechtlichen Regelungszusammenhang* (1995), p. 33 et seq.

⁶ This approach was precised in the *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968*.

⁷ To the question of the identification of space debris cf. Carl Q. Christol, *Space Law: Past, Present and Future* (1991), p.250 et seq.

⁸ See e.g. George T. Hackett, *Space Debris and the Corpus Iuris Spatialis* (1994), p.153 et seq.

⁹ S. e.g. P.B. Dembling, *„International Liability for Damages Caused by the Launching of Objects into Outer Space*, in: