

Space debris, remarks on current legal issues

Armel Kerrest

*Institut de Droit des Espaces internationaux et des Télécommunications
Université de Bretagne Occidentale
B.P.816 - F 29285 Brest cedex France
Armel.Kerrest@univ-brest.fr*

RESUME

A legal definition of space debris must take into consideration its consequences on the legal status of the object. For the purpose of mitigation of space debris at the time of the launch, any object launched in outer space will turn sooner or later into a space debris. For liability purposes, a definition of a "space object" is more useful than the notion of "space debris". It must be sure that every space debris is considered as a space object according to the liability convention. At the end and certainly a more difficult issue is the qualification of a space object as a space debris when it will be technically feasible to remove it. The question of the property of the debris or object should be important.

States are responsible and liable for space debris. According to article VI and VII of the Outer Space Treaty, they must authorise and control any national space activity and make sure these activities will not be conducted against the law. In the case of an accident and excepting the use of nuclear power sources, the main problem lies on damage in outer space to other spacecrafts. In that case, the victim must prove a fault. According with the lack of precise rules it should be difficult.

It should be necessary to precise the law applicable to space debris. At the domestic level, rules must be taken to prevent space debris through an assessment of risk within the licensing process. At the international level, the principle of an obligation to mitigate debris should be clearly accepted. Some general rules should be useful to avoid breach of competition between commercial actors. The adoption of a clear and precise code of conduct should be of great help because it would determine the *good launching States'* behaviour and greatly helps the judge appreciating the proof of a fault in case of an accident.

[This presentation was made possible thanks to the financial contribution of the Centre National d'Études Spatiales (CNES)]

Introduction

1 A LEGAL DEFINITION FOR SPACE DEBRIS.

For a lawyer, a definition is always something very important. We have not only to consider the nature of space debris, we also have to take into consideration the consequences of such a definition: the legal qualification of the object, i.e. the legal status of it. Most of the time these consequences stay *sous-entendus* but they are the real points of interest.

As far as space debris are concerned, it is possible to examine a definition with respect to three moments: The qualification of a space debris for the purpose of mitigation, the qualification of a space debris for responsibility and liability and the qualification of space debris for property purposes and removing.

For the purpose of mitigation, it may be useful to make a distinction between space objects according to their utility in outer space. But we must keep in mind that any space object is going to become a space debris when out of use. The point here is not mostly utility but potential dangerousity of the object to launch.

For responsibility-liability qualification the word used by the treaties is not "space debris" but more generally "space object". The problem is here to be sure that there is not a restrictive interpretation of the notion of space object. Some authors question the fact that every space debris is a space object for the purpose of the liability convention. This discussion is based on a misinterpretation of the very large meaning of the notion of "object" perhaps mistaken with spacecraft or vehicle.¹ If every space object is not a space debris, every space debris is a space object.

For property or removal, the definition issue is more useful but it is also more likely to become controversial. If the definition of space debris is done with this issue in mind it will be useful to consider the potential value of the object or debris and not only its dangerousity. Under the current rules, the object or debris stays under the property of its owner.²

Taking into consideration the fact that meteorites are not debris, and that some natural objects may be space debris when launched by man in outer space, it may be possible to define a space debris as : "a useless man-launched object in outer space".

2 RESPONSIBILITY AND LIABILITY FOR SPACE DEBRIS

In the French text of the treaties there is only one word "responsabilité" which means responsibility and liability as well. Even if both texts are equally valuable, as I am speaking in English, I will argue using the English text, and make a distinction between responsibility and liability.

2.1 Responsibility and control.

According to the Outer space treaty, "States are internationally responsible for national activities in outer space"³. That means that these States must assure that these activities are carried out in conformity with international law. If some international regulations intervene in respect with space debris, States must apply these rules and make sure that their nationals do so. If international law makes obligation to States to limit the creation of space debris, they must implement them to their own activities but also to any "national activity" as set in article VI of the Outer Space treaty. They cannot argue that they are not able to control a private entity's activity, as the State is directly responsible for it. Moreover, when conducted by a "non governmental entity", -wording used in article VI- this activity must be authorised and controlled. Thus, when private activities are conducted, a licensing process is required.

This obligation of control, and the jurisdiction associate to it, is indefinite and applies until the return of the space object. It is not directly connected with registration, it applies whether the object is registered or not, whatever its size or nature may be, as far as it is the consequence of a "national activity in outer space".

2.2 Liability.

As we saw earlier, if a space object is not necessarily a space debris, space debris are always space objects. According to article VII of the Outer space treaty and to article II of the Liability Convention, the Launching State of a space object is liable for damage it may cause.

This liability poses some questions when space debris are concerned.

The determination of the liable Launching State.

The first question is of course that the only condition for a launching State to be liable for a damage caused by a space object is that it should be proven to be the Launching State of this object. This is of course the main difficulty, as space debris are not always known by their father's or mother's name. In that respect three remarks may be done:

- According to article VI of the registration convention⁴, the States having capabilities must help the State of the victim to identify a space object which has caused damage. This obligation is limited by the necessity of co-operation between both States, but there is no reason to think that such a help would not be granted.
- As far as damage are caused on earth, it may be presumed that the space debris should be rather large and heavy to endure entering the Earth atmosphere, in that case it is very likely to be known.
- Moreover, there is a real problem for damage caused in outer space when it is not possible to know the origin of the debris. It should perhaps be possible to create an international fund to pay for damage caused by unknown debris. If the contribution to this fund is made according to the creation of debris it may be a good incentive to mitigate their creation.

Damage on the Earth or damage in Outer Space to an other spacecraft ?

The liability convention makes a fundamental distinction according to the location of the damage.

If the **damage is caused on earth**, the launching State is absolutely liable without any ceiling. This is a very interesting situation for the victim, much better than for any other international damage. Much better for instance that for sea pollution. For the time being the risk is much lower than the risk of damage in outer space.

In the case of a Nuclear Power Source, the damage on earth may be huge. The launching State, which takes this risk, knows it.

However, this situation may also put at risk other launching States. If a debris hits a spacecraft with a NPS on board and if this accident causes a damage on earth, according to the liability convention at its article IV, both States are jointly and severally liable. The victim may ask compensation for the whole to any of these launching States. The final burden of compensation must be shared according to the fault of each State. If the author of the debris is at fault he will pay for the whole, even if its own object was nearly harmless. If no fault can be

proven, the compensation should be shared equally. In that case, the damage on earth may be huge and the liability as such. It should be useful to precise the legal obligation of the NPS users in that respect and at least to put on him a presumption.

Most of the time space debris will cause **damage in outer space**.

In that respect the liability convention is far less efficient,

- It only states for fault liability.
- The liability is no more global, only the launching State at fault is liable, not every one like it is in the case of objective liability
- The liability is no more joint and several, only the State at fault may be sued
- Somebody else and not the launching State may have done the fault, then no liability is provided for under the liability convention.

Thus it should be useful to improve the rules related to this important issue of liability for damage in outer space. For the time being every one intervenes at his own risk. This risk is accepted as a consequence of space activity. As far as few activities were taking place, and as far as only States agencies were acting, this situation was accepted. With the increase of the risk, with the increase of private activities, this situation cannot be sustainable. Insurers will not pay for space debris related risk without having a real possibility to get their money back in case of an accident caused by a debris.

The US Commercial Space Launch Act partially answers the question⁵; the US government takes the risk when it exceeds the Probable Maximum Lost or/and the insurance duration obligation. It is not the case for activities under other law -or in absence of domestic space law-; it is also not the case when the activity at fault is not conducted under a US licence.

International regulations address mainly the issue of damage to third parties on earth (people not taking part in the space activity) it should be improved for damage in outer space.

It is also necessary to harmonise domestic laws and settlement of dispute mechanisms because fair competition may be at risk.

3 REGULATION FOR SPACE DEBRIS MITIGATION.

If we concentrate on the main issue: damage in outer space, we have seen that a fault must be proven in order to get compensation. The implementation of the liability convention is an international law issue. In international

intergovernmental law a fault is an illegal action. Therefore it is necessary to have a precise international law in order to define illegality. As far as space debris are concerned, have we got a precise rule ? The answer is clearly : no.

It is possible, for instance on the basis of article IX of the Outer Space treaty, to find a general principle of law making outer space pollution illegal. Is it sufficient to make space debris illegal ? If we look at the current general practice, which is the reflect of international law in that respect, we cannot really maintain that space debris are illegal. Any space object is due to become sooner or later a space debris; thus, any space activity creates space debris, as not every space activities are illegal, creating space debris is not *per se* illegal.

We have to try to precise what is illegal. In the current state of space law, is or may be consider as illegal and put the launching State at fault: the creation of **too many space debris**. The fault is not the debris by itself; the fault is in the behaviour, the conduct of the actor when creating the debris. But then the question is: what means "*too many*" ? It is very difficult to answer this question. Where are the rules ? They may be find in different directions: at the domestic law level or at the international law level.

3.1 Domestic law.

Given the difficulty to create international law and to control its implementation, it is very often easier to address the question at the domestic level where a powerful legislative power may decide a law and where a powerful administrative power may implement it under the control of the judiciary.

Article VI of the Outer space treaty makes obligation to States to control their national activities in outer space whether they are conducted by them or by any of their related non-governmental entities. The State must authorise and control any of these activities. Thus the domestic level seems to be the appropriate level to control the creation of space debris and to decide what is "*too many*" for that purpose.

The problem is that, by nature, outer space activities are international, they take place in an international space, involve international consortia, may be located in international domain (etc.). Moreover, mitigating space debris creation is very expensive, when private activities are concerned, there is good reasons to think that, given the competition, some entrepreneurs will try to avoid those measures by conducting their activities under a more favourable law. Doing so, they will get a great competitive advantage. It is already the case

for sea activity why should it be different in outer space ? The main rules should be applicable to every competitor, only international law can do that.

3.2 International law:

International law, when accepted as such, is in theory the best solution to make a rule applicable to everybody. For the time being international space law is generally proposed by the COPUOS and accepted by the UN General Assembly as a resolution, when accepted by consensus it may become a customary law and thus, be compulsory to every one. It may also follow the same path and become an international treaty through ratification by States. The compulsory nature is less disputable but the treaty is only compulsory for the States having accepted it. They may very well refuse to do so.⁶

This system was used in the sixties and seventies and was reasonably successful. It enabled the acceptance of the Space treaties and of the UN General Assembly resolutions on space activities.

As far as space debris are concerned this procedure may be rather difficult to use for at least two reasons:

Rules mitigating space debris are **technical rules** they must be rather precise. When we see the difficulties to accept a decision by consensus within the UN Copuos, it should be impossible to address those technical issues and adopt by consensus such technical rules. Some member States of the Copuos do not conduct any space activities they would not appreciate the technical feasibility like space countries would.

Rules mitigating space debris should also be able to change in order to **follow the evolution** of space techniques. Some obligations, which may be considered now as impossible to accept, may be considered as possible and even necessary when space activities will increase. International law through consensus within the UN Copuos cannot be sufficiently flexible to fit this challenge.

3.3 The codes of conduct.

Neither domestic law nor international law, the codes of conduct elaborated by the major space agencies may give us an acceptable solution to improve space debris mitigation.

Considered on a legal basis, **the codes of conduct have a weak direct legal effect.**

For the time being, the codes of conduct are not compulsory even for the space agency which elaborated it. They are only guidelines to take into consideration.

They have even less legal strength against domestic third party (private actor).

Moreover, the codes of conduct have, of course, no legal effect to activities conducted by foreign companies or agencies under foreign jurisdiction.

They of course can be used by the authority in charge of licensing for appreciating the risk of private activities wanting to get a licence. This benefit does not apply if space activities are conducted under the "control" of a State having no real licensing process. But the code of conduct may have another legal effect.

The codes of conduct may have a useful indirect legal effect;

As we saw before, space debris damage are more likely to occur in outer space. There, a fault must be proven to get compensation. What is a fault ? We saw that it is not the debris creation in itself, it is the behaviour which conducted to the creation of the debris. The consideration of a behaviour is much more difficult than the proof of a fact.

The old nineteenth's century "code civil" when considering liability, uses the notion of "bon père de famille", "bonus pater familias" or Good family Father". If a damage occurs, the judge will consider the actual behaviour by comparison with the theoretical behaviour of this theoretical model of "bonus pater familias". If a damage occurs in outer space and that a fault must be proven, the judge will have to compare the actual behaviour of the space actor which has caused a damage and a "normal" good behaviour of the "**good launching State**". He needs to know what is the behaviour of a good launching State. To my opinion, the code of conduct may be used for that purpose.

Even if the codes of conduct are not compulsory and that the actor cannot be sued for any violation, if a damage occurs, it may be considered as the standard of the behaviour of the "good launching State" and put at fault the launching State which do not apply it.

There are some conditions for that : it is necessary to convince the judge that the code reflects the "good behaviour" and that no other behaviour was as good. If the code of conduct is too vague, if some other codes do not provide for the same rule,

it may be easy to prove that it is only one way to behave but that others are equally acceptable.

4 CONCLUSION

As a conclusion, I would like to make some practical proposals:

4.1 At the international level

- It should be useful to precise and make clear the principle of an obligation to mitigate space debris.
- It should be useful that the International Community (i.e. the UN GA) asks the space agencies to elaborate a code of conduct reducing space debris. This would give to these codes a useful international legitimisation.
- More practically it should be useful to register every space object, the spacecraft but also every object launched with it. This would bring out the utility of such objects and encourage a reduction of space debris.⁷
- It should also be useful to precise the liability rules when nuclear power sources are used in order to make clear that the damages caused by nuclear pollution should be compensated by the NPS user and not by the launching State of the other spacecraft.

4.2 At the agencies level

- A common code of conduct or at least a co-ordination of the codes is useful. It would make clear the appropriate conduct of space actors with respect to space debris mitigation.
- If it is clear and precise enough, this code could be used by judges to characterise a faulty behaviour for application of the liability convention or any other liability law.

Notes

¹ This misinterpretation comes from a disputable wording of the "component part" of a space object within the liability convention: "*The term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof*". In fact the component part is itself a space object, which have component parts too and so on... This precision in article I was not useful, a "space object" being anything which has been launched in outer space whatever its size. The definition used in the ESA draft of a European Space debris safety and Mitigation Standard is much better: it distinguishes "space vehicle" "space debris" and "space object" thus avoiding this vicious circle.

² Cf. OST article VIII. "*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*"

For that issue it may be useful to compare the status of space debris with maritime wrecks.

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, opened for signature on 27 January 1967, (hereafter: OST) article VI

⁴ Convention on Registration of Objects Launched into Outer Space (the Registration Convention), opened for signature on 14 January 1975, (article VI): Where the application of the provisions of this Convention has not enabled a State Party to identify as space object which has caused damage (...), other States Parties, including in particular States possessing space monitoring and tracking facilities, shall respond to the greatest extent feasible to a request by that State Party, or transmitted through the Secretary-General on its behalf, for assistance under equitable and reasonable conditions in the identification of the object. (...)

⁵ Commercial Space Transportation Competitiveness Act of 2000'. At sec.7 US code title 49 subtitle IX chap 70112

⁶ See the Moon agreement at first accepted by consensus within the COPUOS and UNO General Assembly, and then not ratified as a treaty.

⁷ See for instance the registration on the UN register by the US as "spent boosters, spent manoeuvring stages, shrouds and other non-functional objects" and by France as "Ariane third stage".