

SPACE DEBRIS AND INTERNATIONAL LAW

by

Professor Dr. Sylvia Maureen Williams
Chair of International Law - University of Buenos Aires
Member of IISL, IAA - Rapporteur ILA Space Law Committee

I. The interdisciplinary approach

The title given to Session 2 of the 38th IISL Colloquium is highly illustrative and reflects a trend which was generally followed from the initial stages of the treatment of space debris. Indeed this is an area where, to produce realistic results, the need for lawyers and scientists to work together is clearly manifest. Both the International Institute of Space Law and the Space Law Committee of the International Law Association are clear example of the interdisciplinary approach in this field. The purpose of this paper, therefore, is to identify some legal issues arising from recent technical studies relating to space debris.

The latest developments of science are indicating that, because of the effect of the Earth's gravitational field, it is most economical to deorbit into the Earth's atmosphere below 25,000 Km or to boost to a higher altitude above that orbit (1). The idea is, naturally, to prevent abandoned (or non-operational) space objects or small particles arising, inter alia, from collisions between them, (or fragments of breakups, paint, coating, etc.) colliding with present and future functional systems. This is an environmental risk which demands urgent treatment.

Towards the end of the eighties part of the doctrine was attracted by the idea

that an obligation to remove space objects once their useful life had ended should be imposed upon the launching state or international organisation, as the case may be. In October 1988, on the occasion of the Ibero-American Meeting on Air and Space Law held in Asunción del Paraguay, this idea was voted by the lawyers as one of the conclusions of the Conference. In May of that same year, during an International Colloquium organised by the University of Cologne on Environmental Aspects of Activities in Outer Space -which may well be considered a landmark in the interdisciplinary treatment of the subject-

(2) some of the participants -albeit timidly- had introduced a somewhat similar idea.

However, when the drafting of the ILA International Instrument began and a number of questionnaires circulated among the members of the Space Law Committee, it was soon realised that the main objective was to gain the maximum support from the international community and, therefore, start at a low level of compulsion. Consequently, the "obligation to remove" was not included in that text and, although attractive to the academic world, was left in abeyance for pragmatic reasons.

The scientific data provided today is most alarming. When speaking of the different categories of space debris, the Ad Hoc Expert Group of the IAA explains that only 6% of the catalogued objects are

operational satellites and that about one-sixth of the objects are derelict rocket bodies discarded after their use and over one-fifth are non-operational payloads. The remnants of over one hundred satellites and rocket stages destroyed on orbit account for 40% of the population by number (3). In addition, information concerning military satellites is not, as a rule, readily available.

If we have in mind what was said at the outset in connection with costs of deorbiting and percentages of derelict rocket bodies and non-operational payloads, based on the findings of the IAA Ad Hoc Expert Group in 1995, it would not be unreasonable to start thinking of "commitments to remove" for a not too distant future.

II. Responsibility and Liability

By and large, this is a major question when dealing with risks arising from space debris. Way back in 1982, on the occasion of the 25th IISL Colloquium, Dr. Perek summarised what may be seen as the precautionary principle in the field of man-made space debris and risks of collision between space objects: "prevention is better than cure" (4).

The question of responsibility and liability, inspired in the rules embodied in the 1972 Liability Convention, happened to be one of the main areas of disagreement which confronted lawyers and scientists from the initial stages of the interdisciplinary approach to space debris. It was an issue over which the opinion was openly divided within the ILA Space Law Committee during the drafting of what is now the Buenos Aires International Instrument on the Protection of the Environment from Damage caused by Space Debris. Briefly, arguments are as follows.

The discussion has gone full circle around the problem of identification. This led two of the scientific consultants of the Committee, Professors Rex (Germany) and Ricciardi (Argentina), throughout the various readings of the then draft instrument on space debris, to strongly question the effectiveness of including liability provisions.

The most classical assumption of collision, they contended, happened when a large space object (active or otherwise) is hit by a small object (normally second generation debris) which is frequently non-trackable and may render the large object defunct (4).

In similar manner, it seems hard to determine, in the present state of development of technology, whether the damage was caused by man-made debris or by a natural object. If we think of the large number of space objects to be positioned in low earth orbits in the forthcoming years, the magnitude of the problem of identification may be easily appreciated.

Let us look at a further example provided by Professor Rex (5) concerning the remote possibility of collision between two large identifiable objects. The intricacies of establishing the degree of fault, negligence or recklessness incurred by each is a labyrinth quite familiar to the lawyer. It is true that the 1972 Liability Convention, in Article III, envisages damage caused elsewhere than on the surface of the Earth but, still, in practice this will not be enough to deal with the matter effectively: liability based on fault is applicable on this assumption with the ensuing complications as to the burden of proof.

On these grounds, Professors Rex and Ricciardi are against the inclusion of any rules on international liability. Both experts firmly support the need to put the accent on prevention -as Dr. Perek was saying in 1982- and, at a later stage, with further experience, move on to drafting liability provisions.

This does not seem an easy task. In cases of highly populated orbits, such as GEO, how are we going to establish from which space vehicle the harm-causing debris has originated? And even more difficult, as observed earlier, will be to determine whether the damage is caused by a man-made object or by natural objects. The latter have been left out, by consensus, from the text of the ILA International Instrument (5). Military satellites, as was suggested previously, are equally a matter of concern in the context of space debris: it is unrealistic to expect information from the launching state. Yet, even though the lack of registration may raise a practical problem for identification purposes, it would not affect the responsibility and liability of the launching state in case of damage (6).

When prevention fails, the need will arise for active measures designed to eliminate or, at least, as Professor Christol says, to mitigate and reduce debris-based harms (7).

So we shall now turn to the legal arguments the majority of which reveal a common denominator concerning the need for rules on responsibility and liability. The reasons put forward are weighty enough and resulted in the adoption of the Cairo Resolution (ILA 1992), by consensus -after thorough discussion during the working session-, at the Plenary Meeting of the 65th Conference of the institution (8).

Professor Böckstiegel's view, for example, is down to earth and convincing in the sense that, to be in line with the 1972 Liability Convention, provisions on responsibility and liability for space debris are required. Moreover, as a matter of experienced draftmanship, the chairman of the ILA Space Law Committee points out that, as time goes by, it would be far easier to delete any stale rules on this matter than to find support for an inclusion of the kind.

All in all, the obligations to reduce and control space debris and the responsibility of states and international organisations to respect these commitments -which are embodied in the ILA International Instrument adopted without dissent by the 66th Conference in Buenos Aires - are undoubtedly stronger when coupled with rules on liability.

This line of thought advocated by the Chairman and the Rapporteur of the ILA Space Law Committee, has been widely supported by the doctrine. I shall not pause on the reasons given by the ILA Space Law Committee members - since these may be found in the Conference Report- but just make a brief mention and then move on to explore other sectors.

Professors Christol, Gorove and Malanczuk have repeatedly endorsed this view, the latter with emphasis during the ILA Cairo Conference. Professor Cocca has championed the position - vehemently at times- ever since his days as representative of Argentina to the Legal Sub-Committee of COPUOS. Professors Leanza, Seyersted and Chowdhury fully agreed with the idea from the first steps given in the elaboration of the ILA draft.

From outside the ILA Space Law Committee a number of experts have given their valuable opinions. Dr. Rest (9) favours the combination of the two complementary concepts (responsibility and liability) and refers to the work of Dr. Julio Barboza as Rapporteur of the International Law Commission on the topic of International Liability for Injurious Consequences arising out of Acts Not Prohibited by International Law which, by advancing a considerable deal towards the application of strict liability, is reflecting a recent trend in today's world.

The First European Conference on Space Debris (Darmstadt, April 1993) offers interesting conclusions, including the legal aspects of the problem. Howard A. Baker, in a section of his paper submitted to the Meeting (10) refers to liability for damage caused by space debris where he raises a few debatable points which, in his mind, are unclear under the 1972 Liability Convention. He questions whether the concept of damage included in that text should be extended to the outer space environment. This doubt finds an express answer in the ILA Instrument (Article 1 (d), and Articles 7 and 8) where the term "environment" is meant to include both the earth and outer space environment. Dr. Marietta Benkö, for her part, dealt with the issues of responsibility and liability in her presentation to that Conference and drew an interesting parallel with the UN Principles on Nuclear Power Sources (11).

The Commission on Environmental Law of the World Conservation Union has equally been concerned by the subject. This is reflected in the International Covenant for Environment and Development. Part V, on "Obligations relating to Liability and Compensation (Articles 46-56), contains rules concerning the use of terms, state responsibility, state liability, exemptions, coincidence of

state liability and civil liability, local remedies, immunity from jurisdiction, etc. Article 46 makes a distinction between "harm" and "damage": the former is a factual interference with a legal interest whilst the latter would be the consequence of harm (actual or potential). The scope of this definition is even broader than the one embodied in the Buenos Aires ILA Instrument as it expressly includes any loss or profit and the legal cost of reasonable measures to prevent or minimize harm resulting from the incident.

This Covenant declares, without a shadow of doubt, that a state is responsible under international law both for the breach of obligations under the Covenant and of other rules of international law concerning the environment. States are made liable for significant damage to the environment of other states or of areas beyond national jurisdiction caused by activities under their jurisdiction or control. The terms of this Covenant, and its scope, are a necessary reference when considering the inclusion of responsibility and liability provisions within a legal framework governing space debris.

Of a more recent vintage are the comments made by Professor Malanczuk on the occasion of the Symposium on "Technical and Policy Issues related to the Use of the Space Environment" held on 27 March 1995 in Vienna under the auspices of the UN Committee for the Peaceful Uses of Outer Space and the IISL. I shall pause for a while on a few of this author's useful observations on responsibility and liability some of which are directed to the 1994 ILA Instrument.

In the first place, Malanczuk considers that the 1967 Space treaty only contains a general clause on liability and is based on the traditional fault principle in customary international law, requiring wrongful intent or some form of negligence on the part of the launching state. Conversely, in his view, the 1972 Liability Convention establishes a genuine inter-state principle of absolute liability, regardless of fault, with the exception of damage 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 (14) to which liability based on fault applies.

It should be made clear, however, that the point of departure of the ILA Instrument was the generally accepted view favoured, among others, by Bin Cheng in many of his writings (15), that the Liability Convention was an elaboration of the principle of international liability for damage caused by space objects established in Article VII of the 1967 Treaty. And that the starting point of absolute liability is the 1967 Treaty.

Secondly, Malanczuk points out that the definition of damage contained in the ILA Instrument is broader than the one embodied in the Liability Convention (16). Indeed, twenty-three years have elapsed since the coming into force of this Convention on 1 September 1972. Hence, the 1994 definition is an elaboration of the 1972 one, so as to adapt it to the present situation arisen by the risk of space debris. This situation, in the present writer's view, does not remain uncovered by the definition of damage in the Liability Convention (Article I (a)) although, in practice, it may give rise to some difficulty. Thus the reason for a more specific definition applicable to space debris in the ILA

Instrument (Article 1 (e) which is supplemented by the rules of Article 2).

Thirdly, the reference to the Liability Convention in Article 7 of the ILA Instrument, which reads as follows:

The State or international organisation, party to this Instrument, that launches or procures the launching of a space object shall bear international responsibility for assuring that national activities are carried out in conformity with the provisions of this Instrument, the 1967 Space Treaty and the 1972 Liability Convention

is being questioned (17) by Malanczuk.

On this point may I recall that the spirit and wording of the previous space treaties has been followed by the ILA document. The reference to the Liability Convention is far from superfluous and, it is believed, implies a step forward in the confrontation of the problem. It is true that a few States Parties to the 1967 Treaty have not yet ratified the Liability Convention. Therefore, in theory, they would only be bound by the rules of customary international law enshrined in this Convention. However, the "absolute standard of liability" - in Malanczuk's words- already existed, albeit in more general terms, in article VII of the 1967 Treaty. Consequently, when accepting the ILA Instrument, States would be bound by all the relevant provisions of the Liability Convention, whether customary or otherwise.

The problems involving identification, not only to determine whether damage was caused by artificial (and not natural) space debris but also to prove that the debris in question originated from a space object registered by another

state are clearly perceived by Malanczuk in his paper (19). Naturally, as is pointed out, if space debris hits an active satellite in orbit liability based on fault comes into action, pursuant to the Liability Convention, with the consequent burden of proof on the part of the claimant. The difficulties inherent in such a procedure are well-known: there are scarcely any legal elements involved as it all depends on technical and scientific evidence.

A glaring example of this situation is provided by the recent case "Graham and Graham v. RECHEM" decided on 14 June 1995 by Justice Forbes in the High Courts of London, Queen's Bench Division, the Strand. The case hit the headlines of London's most important newspapers. The trial lasted 14 months and is believed to be the longest trial to date in the UK. The legal costs involved were over US\$ 10 million. The case hinged on whether the plant had released toxic amounts of PCBs and dioxins from its incinerator which had infected the claimant's cattle, or whether the latter had caused the problem by over-feeding the cattle in an effort to improve the yield. The claimants contended they only had to prove that the emissions from the plant were capable of causing the problems experienced by their daily herd. The defendant, for its part, insisted that the claimant had to prove each and every link in the chain of causation.

To that end, a huge amount of technical and scientific literature had to be mastered before any issues of law could be argued. Moreover, science is a constantly evolving area and some of the pertinent issues rapidly changed as new scientific papers were published. At the end of the day it was ruled that the incinerator did not emit PCBs, dioxins and furans "in anything other than negligible quantities throughout its operational life

and certainly not in sufficient amounts to pose any kind of risk to either animal or human health" (19).

This situation, if taken to the field of space debris and the protection of the environment from damage arising thereof, is infinitely more complex. It is almost impossible, at the moment, to think of space activities that do not produce some amount of debris. For these reasons it seems sensible to lay strong emphasis on the precautionary principle, as do the scientists and most lawyers, and as does Peter Malanczuk (20). This principle is embodied in Article 4 (obligation to prevent) of the ILA Instrument.

Finally, the mentioned author asks himself whether a launching state should be held liable for leaving inactive satellites in orbit and readily answers in the negative (21). And even though this conclusion appears, at first sight, impeccable in the light of present international law, on second thoughts it lends itself to some reflection. First, it is to be wondered whether inactive satellites are complying with the requirements of Article I of the 1967 Space Treaty, particularly the "benefit and interest of all countries" and freedom of scientific investigation". It is submitted that, on these grounds, inactive satellites using up orbital positions, particularly in GEO, are open to question. Secondly, and in these circumstances, it is valid to ask whether the international community, or a state in particular would not be entitled to request consultations with the State of registry of the satellite in accordance with Article IX of the 1967 Treaty. If prevention is to be the golden rule this procedure -coupled with an effective mechanism for the settlement of disputes - would appear a valid and reasonable interpretation of the law in force.

III. Notes

1. IAA Position Paper on Orbital Debris, 1995, p.15.

2. K.H. Böckstiegel (ed.), ENVIRONMENTAL ASPECTS OF ACTIVITIES IN OUTER SPACE - STATE OF THE LAW AND MEASURES OF PROTECTION (1990). The idea of the "obligation to remove" was voiced informally and therefore not been recorded as a conclusion to the papers submitted. Shortly afterwards Dr. L. Perek, in one of the first readings of the ILA Draft, suggested the possibility of a "police system" for the removal of space debris in the orbits to be carried out by the countries who had the technology with the consent of the states of registry of the satellites originating debris.

3. Op. cit. in note 1 (suora), p.2.

4. L. Perek, TRAFFIC RULES FOR OUTER SPACE, Proceedings of the 25 Colloquium on the Law of Outer Space (1983), cit. by Carl Q. Christol in SCIENTIFIC AND LEGAL ASPECTS OF SPACE DEBRIS, Proceedings of the 36th Colloquium on the Law of Outer Space (1994).

5. See the Final Text of the REPORT submitted by S.M. Williams (Committee Rapporteur) to the 66th Conference of the ILA, Buenos Aires, 1994.

6. Ibid. Also Carl Q. Christol, op. cit. in note 4 (supra).

7. Ibid. Also text of the ILA Instrument.

8. See REPORT to the 65th Conference of the ILA (Cairo), by S.M. Williams and Resolution adopted at the Plenary Session.

9. A. Rest, NEW LEGAL INSTRUMENTS FOR ENVIRONMENTAL PROTECTION, CONTROL AND RESTORATION IN PUBLIC INTERNATIONAL LAW, Environmental Policy and Law 1993, pp.260-272.

10. H.A. Baker, POLICY CONSIDERATIONS FOR THE REGULATION OF SPACE DEBRIS, chapter entitled LIABILITY FOR DAMAGE CAUSED BY SPACE DEBRIS, Proceedings of the First European Conference on Space Debris, Darmstadt (1993).

11. M. Benkö, SPACE DEBRIS: LEGAL PROBLEMS TO BE SOLVED WITHIN THE UNITED NATIONS, Loc. cit. in note 10 (supra).

12. Working Draft 5 (December 1993).

13. P. Malanczuk, REVIEW OF THE REGULATORY REGIME GOVERNING THE SPACE ENVIRONMENT - THE PROBLEM OF SPACE DEBRIS (1995). Manuscript by courtesy of the author.

14. Ibid., p.18.

15. B. Cheng, INTERNATIONAL RESPONSIBILITY AND LIABILITY OF STATES FOR NATIONAL ACTIVITIES IN OUTER SPACE ESPECIALLY NON-GOVERNMENTAL ENTITIES, Essays in Honour of Wang Tieya (R.St.J. Macdonald ed.), Kluwer (1993). Also, inter alia, LIABILITY FOR SPACECRAFT, Current Legal Problems Vol. 23 (1970), CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS, (Jasentuliyana and Lee, eds.), Manual of Space Law (1979), SPACE ACTIVITIES, RESPONSIBILITY AND LIABILITY FOR, (Bernhardt, ed.),

Encyclopedia of Public International Law,
Instalment 11 (1989).

16. Malanczuk, op.cit. in note 13 (supra),
p.20.

17. Ibid., pp.20-21.

18. Ibid., p.19.

19. The author is grateful to Muna
Dandan from NABARRO NATHANSON
(London), who acted in this case, for the
information provided.

20. Op.cit. in note 13, p.19.

21. Ibid.