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IS THE PRESENT INTERNATIONAL SPACE LAW SUFFICIENTLY ARMED FOR THE PROTECTION OF ASTRONAUTS, FUNCTIONAL SPACE OBJECTS AND SPACE ENVIRONMENT AGAINST SPACE DEBRIS, OR SHOULD A LEGAL REGULATORY SYSTEM RELATING TO THIS ISSUE BE ESTABLISHED SOON ?

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Introduction

During the last decades, man-made orbital space debris has become one of the most discussed issues of the present and future development of space activities. From a growing number of papers published in recent years and discussions held at national and international levels, it is evident that an effective protection of astronauts, functional space objects and the space environment itself against the generation and proliferation of space debris has become one of the recognized objectives of the present space community.

I. United Nations and the issue of space debris

/a/ Consideration in the COPUOS Scientific and technical Subcommittee

For this reason, the United Nations Committee on the Peaceful Uses of Outer Space /COPUOS/, which has been serving as a focal point for international cooperation in the peaceful exploration and use of outer space, [2] included the item on space debris on the agenda of its Scientific and Technical Subcommittee /STSC/ already at its thirty-first session, in February 1994. [3] For a detailed consideration of space debris, the Subcommittee adopted a multiyear plan for the period 1996-1998 and established a special Working Group. It focused its attention on measurements of space debris, understanding of data and effects of that environment on space systems; furthemore, the Subcommittee drew its attention on the modelling of the space debris environment and risk assesment; and finally, the attention concentrated on space debris mitigation measures. As the result of that work, a Technical Report on Space Debris [4] emerged, which was assessed by the COPUOS as "an important achievement". This UN body also agreed that, "owing to the complexity of the space debris issue, discussions should continue in order to ensure further progress in developing an understanding of the issue." [5]

A new elementwas also introduced in further proceedings on space debris, when it was recomended that the Inter-Agency Space Debris Coordination Committee /IADC/, an international forum of governmental bodies for the coordination of activities related to the issues of man-made and natural debris in space, should be involved in these discussions. And at its 2001 session, the STSC "strongly endorsed the action undertaken by IADC to reach consensus on debris mitiga-

tion measures". The Subcommittee encouraged IADC to treat the topic with due priority, with a view to completing the task during 2002 so that the results could be reported to the Subcommittee at its fortieth session, in 2003. [6] At the same time, the Subcommittee, acting on the initiative of eight space-faring nations, [7] agreed that starting from 2002, it should consider space debris according to another multiyear work plan. The IADC proposals on debris mitigation would become a centre-piece of that exercise and the Subcommittee would endorse the utilization of these proposals "as guidelines to be implemented on a voluntary basis through national mechanisms." [8]

The IADC fulfilled its task still before the end of 2002 and presented its proposals on debris mitigation guidelines based on consensus among the IADC members. [9] The STSC then began its review of these proposals, which should still continue in 2004, and discussed the means of endorsing their utilization. All member States of the COPUOS have been encouraged to study the IADC proposals and provide their comments before the 2004 session of the STSC.

Simultaneously with the discussions within the United Nations on space debris, or even before them, efforts tending to establish national policies on space debris and introduce debris mitigation standards, have been developed by the most active space-faring nations. For example, the United Sates of America, which started such efforts already in 1987, adopted in December 2000 the United States Government Orbital Debris Mitigation Standard Practices, which are implemented by each government agency according to its own set of policies and procedures.[10] In some other nations, too, /Germany, France, Japan, Russia/ or international organizations /ESA/, such standard making processes have or are being effected.[11] Of course, these initiatives and their results are unilateral. However, they help to create a basis for negotiations on standards and practices at international levels, particularly in the United Nations.

/b/ Initiatives to consider the legal aspects of space debris

The protection of space environment against pollution by space debris has also become a subject of concern of the world space law community. A number of monographs were published, many papers were presented and discussions on the issue of space debris were held at the meetings of international non-governmental organizations, such as the International Law Association /ILA/ and the International Institute of Space Law /IISL/ of the International Astronautical Federation. The legal experts participating in these discussions have mostly held the view that hand-by-hand with the consideration of the debris issue in the scientific and technical area, it is also necessary to ponder the availability and possible development of adequate legal measures for the protection against space debris.

A number of delegations to the COPUOS have been also well aware of this need and suggested two items relating to space debris for possible inclusion in the agenda of the Legal Subcommittee /LSC/ at its future sessions. The first one was entitled "Reviw of existing norms of international law applicable to space debris", the other was conceived wider and called simply "Legal aspects of space debris". [12] These items were also suggested during the informal consultations on future agenda at the following sessions of the LSC.

When the Technical Report on Space Debris was finalized at the

Scientific and Technical Subcommittee and adopted at the 1999 session of the COPUOS, a number of delegations expressed the view that there should be follow-up activity by the Legal Subcommittee on that report. A group of 13 countries led by France proposed to distribute the Technical Report widely and to request the COPUOS to instruct the LSC, inter alia, to review the applicability of the space treaties to space debris issues in the light of the report adopted by the STSC in 1999 and to assess whether the Subcommittee should consider additional matters with regard to its work. [13] On the other hand, some other delegations expressed the view "that it was still premature for the Legal Subcommittee to discuss the issue of space debris, and that the discussion of the issue by the Legal Subcommittee should be postponed at least until the technical report had been thoroughly analysed by member States and relevant space related organizations and industry." [14]

Since then, this division of opinions on legal aspects of space debris has remained in principle unchanged. It wasretained also during the discussions at the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space /UNISPACE III/ held in 1999 [15] and the following sessions of the COPUOS, STSC and LSC.

A new impetus to discussing legal aspects of space debris in the LSC was given during the consideration of item"Information on the activities of international organizations relating to space law" at the forty-first session of the LSC in 2002 when the observer for the European Space Agency /ESA/,acting on behalf of member States of that organization and States cooperating with it, presented an analysis carried out by ESA on the legal aspects of space debris. [16] And some delegations from this group of States expressed the view that "while the work currently being carried out by the Scientific and Technical Subcommittee and the Inter-Agency Space Debris Coordination Committee /IADC/ should be fully supported, it would also be highly desirable for a declaration of principles relating to the prevention of space debris to be drafted and adopted as soon as possible." In some more specific terms, it was then proposed by this group of States to follow the example of the 1992 Principles Relevant to the Use of Nuclear Power Sources in Outer space /NPS/. Such a text "could proclaim and define as a matter of principle the obligation to limit the production of space debris. The text could also incorporate the rules endorsed by the COPUOS on the basis of proposals made by IADC." [17]

On the other hand, an opposing view also sounded during that session of the LSC, according to which "the scientific and technical aspects of space debris still required further examination and study". That delegation also expressed the view that the development of principles on space debris would require the consideration of numerous aspects of the existing United Nations treaties on outer space, as well as the Principles Relevant to the Use of NPS in Outer Space. Therefore, that delegation recommended to consider the development of such principles within the context of a universal comprehensive convention on outer space. [18]

The most recent initiative has been undertaken by the group of ESA member and cooperating States, led by France, at the last session of the LSC in 2003. Based on the assumption that the IADC guidelines presented to the foregoing session of the STSC would be adopted by the COPUOS in 2004, these States stressed

the need for universal and prompt application of the guidelines. To this end the LSC should study all the legal implications of these guidelines /e.g. universal application, responsibility and control/. For this reason,a 4-year work plan was outlined, the essence of which would be the review of the existing legal regime applicable to space debris and of legal matters arising from the IADC mitigation guidelines. Its outcome should be inserted in a report setting out legal issues identified so that a legal instrument could be prepared for adoption by the COPUOS and the General Assembly. [19]

However, this initiative was again rejected by another group of delegations which continued to hold that "it was premature for the Legal Subcommittee to consider legal aspects of space debris in view of the multi-year work plan on space debris mitigation guidelines being carried out in the Scientific and Technical Subcommittee." [20]

II. The question of applicability of the existing UN Space Treaties and Principles to space debris

The author of this report does not deny that he belongs to those proposing a close cooperation of scientists, engineers and lawyers in the elaboration of adequate legal tools for maintaining outer space clean and safe. [21] In this endeavour, the study of international law aspects of the space debris issue must be initiated, which should start by the question: Is the present international legal regime of outer space, which has been established during the last four decades by the United Nations, sufficiently armed to meet the needs of a satisfactory protection of astronauts, functional space objects and space environment against the generation and proliferation of space debris ?

The fundamental legal instrument of the international space law, the 1967 Outer Space Treaty /OST/, enshrined a number of general principles which as such are also relevant to the issue of space debris. According to its Article I, the exploration and use of outer space shall be the province of all mankind. In its Article VI, the principle of international responsibility for all national activities, be they carried by governmental agencies or non-governmental entities, i. e. by private persons, physical or juridical, and the groups thereof, has been declared. Moreover, in Article IX of the OST, which established the principle of cooperation and mutual assistance of the States Parties to the Treaty, a general principle of protection of the space environment was inserted: The States Parties to 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 extraterrestrial matter and, where necessary, shall adopt appropriate measures for this purpose." But can it be deduced that this language also covers the harmful effects caused by space debris ?

In its Article VII, the 1967 OST includes, as one of its essential principles, the international liability for damage caused by space objects or their component parts on the Earth, in air space or in outer space. This principle of the OST created the basis for the 1972 Convention on International Liability for Damage Caused by Space Objects. In Article I of this Convention, it is spelled out that the term "space object" includes "component parts of a space object as well as its launch vehicles and parts thereof." However, is it possible to qualify as com-

ponent parts of a space object or parts of its launch vehicle the fragments of such objects which could threaten the life of astronauts during their extra-vehicular activities, damage a spacecraft and injure its crew, but which would be difficult to monitor and identify ?

The Liability Convention deals with two categories of damage, one caused by space objects on the surface of the Earth or to aircraft in flight, the other caused elsewhere than on the surface of the Earth to a space object of the launching State or to persons or property on board such a space object by a space object of another launching State. While in the first category of damage absolute liability is provided, the second one shall only be applied if the damage is due to the fault of the launching State or the fault of persons for whom it is responsible. However, the term "fault" has not been specified in the 1972 Convention. May it be assumed that not only "intent" but also "negligence" are to be considered as a basis of fault ? [22]

Furthermore, it should be observed that the term "damage", as defined in the 1972 Liability Convention, means only "loss of life, personal injury or other impairment of health; or loss of or damage to property of States and persons, natural or juridical, or property of international intergovernmental organizations". Therefore, it must be deduced from this definition that the Liability Convention does not cover a damage caused by space activities to the Earth or space environments.

Some provisions, which might be considered as applicable to space debris, can be found also in the 1975 Registration Convention, which established the duty of the launching State to register space objects both nationally and internationally /i.e. with the United Nations/. According to this Convention, each State of registry shall inter alia notify the UN Secretary-General "to the greatest extent feasible and as soon as practicable, of space objects concerning which it has previously transmitted information, and which have been but no longer are in Earth orbit." It is to be recalled that in the Registration Convention, the term "space object" is specified in the same way as in the Liability Convention, i.e. that it includes component parts of a space object as well as its launch vehicle and parts thereof.

Some attention should be also drawn to the 1979 Moon Agreement which, however, has collected only a limited number of adhesions thus far. It is worthwhile to observe that the States Parties to this Agreement, in exploring and using the Moon, are obliged to take measures to prevent the disruption of the existing balance of its environment, by its harmful contamination through the introduction of extraenvironmental matter or otherwise. This provision may also include the pollution of the Moon environment or the areas of the Moon by space debris, if it should be as big as to lead to a disruption of the balance of the Moon environment.

A certain step forward has been done only in the specific field of the Use of Nuclear Power Sources /NPS/ in Outer Space. The 1992 Principles implemented, inter alia, the idea of storing the nuclear reactors and radioisotope generators in a disposal orbit after the conclusion of the operational part of their missions. They also brought a certain specification of the general principle of liability for damage as far as the determination of compensation for damage is concerned. The relatively successful outcome of the efforts for the regulation of the use of NPS in outer space, effected by a set of principles

adopted by the UN General Assembly on the basis of consensus reached in both Subcommittees of the COPUOS, offers an example for a similar approach to the solution of the problems of protection of the space environment against space debris.

III. Desirability of elaboration of a special legal regulation of space debris

As evident from the above-mentioned examples, which might be completed by additional questions, the up-to-date international space legislation has been built on the concept "space object". This term has been used as a fundamental element for establishing the principles and rules governing space activities and has also become one of the basic notions in the space law doctrine. Accoding to Article VIII of the OST, a State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object and over any personnel thereof, while in outer space or on a celestial body. Ownership of space objects, 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. And they shall be returned to the State Party which furnished identifying data prior to their return.

In recent years, however, the growing number of remains of these objects, which, having ended their missions, became useless "space debris", raised completely new problems. They deserve a specific approach and require a sharp differentiation between the existing rules governing "space objects" and an appropriate regulation of "space debris". For this reason, the consideration of legal aspects of space debris is necessary and the elaboration of a special legal document on this subject in the United Nations is highly desirable. Inter alia, such legal document should clearly establish from which moment a space object or its parts become non-functional, useless and even harmful, and should be treated as space debris.

Such approach was also adopted by the Space Law Committee of the International Law Association /ILA/ when this non-governmental organization, which has been initiating the progressive development of international law and its codification, was preparing a Draft International Instrument on the Protection of the Environment from Damage Caused by Space Debris. This unofficial document, as adopted by ILA at its 66th Conference held in Buenos Aires, in August 1994, offers a model of a special document on space debris, which might be used as a basis for negotiations on the legal regulation of this issue in the United Nations.

When reading the ILA Draft Instrument, it is possible to ascertain that its legal definition of "space debris", which means "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", is in harmony with the results of scientific and technological consideration of the issue. [24] Furthermore, the terms "environment" and "damage" are well defined. It is significant that the latter term means not only loss of life, impairment of health, and material damage, but also any adverse modification of the environment of areas within or beyond national jurisdiction or control, i.e. including the space environment.

The formulation of substantive principles of the ILA Draft instrument can also be used for consideration of the building blocks for the future official document to be negotiated. In particular, the principles of responsi-

bility and liability for damage caused by space debris should be clearly stated in the official document. Finally, the dispute settlement system concerning the interpretation or application of such document should be also established. It is noteworthy that the ILA Instrument has remained flexible in this respect, trying to combine the method of amicable settlement with the compulsory methods of arbitration and adjudication. [25]

The progress reached in the studies of space debris and its results, particularly reflected in the 1999 Technical Report on Space Debris and the 2002 IADC space debris mitigation guidelines, enable to transform the main conclusions of these documents into condensed principles by which the Draft Instrument worked out in the ILA could be completed and innovated. The main duties concerning measures to be taken in the construction and operation phases of space objects might be included. The different methods of mitigation measures, such as limiting debris released during normal operations, minimizing the potential for on-orbit, post mission break-ups resulting from stored energy and break-ups during operational phases, could be transformed into legal principles and rules. Furthermore, the post mission disposal of space objects that have terminated their mission, particularly those in the geosynchronous region, should be made compulsory. And measures for prevention of on-orbit collisions should be also inacted.

Moreover, it could be also pondered whether the right of any State or international space organization to intervene larger pieces of space debris, particularly at the most exposed parts of space, should not be explicitly recognized. Of course, thisright would be applied rather exceptionally and should be subject to special conditions and procedures. In this respect, the space legislation might build on the experience from the field of the law of the sea, namely from the International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualities, which was concluded at Brussels on 29 November 1969. [26]

Another example from the area of the law of the sea,which might be used mutatis mutandis for establishing similar measures against space debris, is offered by the 1982 United Nations Convention on the Law of the Sea, which entered into force in 1994. Dealing with artificial islands, installations and structures in the exclusive economic zones /Article 60/ and also with those on the continental shelf /Article 80/, the 1982 Convention provides:"Any installations or structures which are abandoned or disused shall be removed to ensure safety of navigation, taking into account any generally accepted international standards established in this regard by the competent international organization." [27]

Conclusions

When dealing with the regulation of space debris, a close cooperation between experts studying scientific and technological aspects of this topic and those taking care of its legal problems is indispensable. Simultaneous considerations by both these communities and mutual exchange of information on the progress and results in both these areas are essential, well coordinated investigation programmes and joint discussions are desirable.

Without doubt, space debris is a very complex issue which requires pondering of different,

some times even opposing, needs. The resolution of all problems involved cannot be expected to be fast. For this reason, and also due to the need for maintaining a continuity in the progressive development of space law, it is advisable to start with an analyses of the existing tools of international law that might be relevant to this issue and with the ascertainment of gaps in the up-to-date legal regime of outer space.

The main objective of the consideration of legal aspects of space debris should be the elaboration and adoption of a special legal document that would include principles relevant to all essential aspects of this issue. Such an instrument should clarify the interpretation of the relevant space agreements in force with regard to their possible application to space debris. Moreover, it should regulate those aspects of the issue, which are not yet governed by the present international space law.

As to the form of such instrument, an international convention, i.e. a legally binding treaty, would be the most exact solution. However, in the light of actual practice of the United Nations, a set of principles developed in the COPUOS with the participation of both its Subcommitteesand approved by a UN General Assembly resolution, would become the satisfactory form of an international regulatory instrument on space debris for the time being. In such principles, endorsed by the world organization, an agreement among its member States would be reflected and, at the same time, a certain degree of the rule of law would be ensured. A set of UN principles would establish a basis for a legally binding convention on the same subject to be concluded some time in the future. The compliance of States and international organizations with these principles, and the supervision of the activities of non-governmental entities by appropriate States, would lead to a unified practice in this field and to the creation of a conviction of all legal persons concerned on the desirability of such principles.

Simple guidelines for practice and policies, which should be implemented only on a voluntary basis through national mechanisms, though capable to improve to a certain extent the present practice, would not lead to internationally harmonized actions. Moreover, they would not give rise to the feeling of duty to comply with them, if the decision on their application should lie only with the addressee of the guidelines. And there would not be any international responsibility and sanctions applicable in cases of non-compliance with these guidelines. Such measures would not only lack any compulsory force, but also a sufficient recommendatory weight, thus remaining only a kind of advisory proposals for unilateral actions.

Conversely, the work on a set of UN principles relevant to space debris would have a potential to strengthen "broad international cooperation in the scientific as well as the legal aspects of the exploration and use of outer space for peaceful purposes", as aimed by the 1967 Outer Space Treaty, in this particular field. [28]

References

1. Chairman, UN COPUOS Legal Subcommittee; IAF General Counsel; IISL Vice-President. The views expressed in this paper are those of the author and do not necessarily reflect the positions of any of these organizations.

2. See the Report of UNISPACE III, Vienna, 19-30 July 1999, UN doc. A/CONF.184/6, para.15 at p.21.

3. This was done in accordance with the decision of the UN General Assembly inserted in its resolution 48/39 of 10 December 1993.

4. The so called Rex Report.See UN doc. A/AC.105/720, 1999.

5. See the Report of the COPUOS, GA Official Records, Fifty-fourth Session, Supplement No. 20/A/54/20, para.43 at p.6.

6. See Report of the STSC on its thirty-eighth session, UN doc. A/AC.105/761, para.128 at p.21.

7. Canada, China, France, Germany, India, Russia, United Kingdom and United States. See UN doc. A/AC.105/C.1/L.251/Rev.2.

8. See UN doc. A/AC.105/761, paras.129-130, at pp.21-22.

9. See UN doc. A/AC.105/C.1/L.260.

10. See National research on space debris, safety of space objects with nuclear power sources on board and problems relating to their collision with space debris, UN doc. A/AC.105/789/Add.1, p.8 et seq.

11. See e.g. the report of Germany on its coherent project entitled "Space debris end-to-end service" in the UN doc. A/AC.105/789/Add.1, p. 2 et seq.

12. See Report of the LSC on its thirty-fifth session, 1996, UN doc. A/AC.105/639, paras 54-56 at pp. 11 and 12. In an unofficial background note submitted by the delegation of the Czech Republic, which sponsored the first of these proposals, it was recommended to examine particularly the following questions: Does the definition of "space object" as contained in the 1972 Liability Convention and the 1975 Registration Convention cover space debris ? Do provisions of the 1967 Outer Space Treaty 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 of 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 ?

In this proposal, it was emphasized that "these and other questions are of a legal nature and should be analysed and answered by legal experts" and that "the consideration of these questions would not amount to the drafting of new provisions but should serve to clarify the issues involved and help to improve the interpretation and application of the existing norms of international space law. See ibidem, Annexes, III/E, p.38.

13. See the Report of the COPUOS, GA Official Records, Fifty-fourth session, Supplement No. 20/A/54/20, Annex II at pp.18-19.

14. See the Report of the STSC on the work of its thirty-sixth sesseon, UN doc. A/AC.105/719, para. 40 at p.5.

15. Resolution 1 of the UNISPACE III, entitled "The Space Millenium: Vienna Declaration on Space and Human Development", mentioned in rather general terms "advancing scientific knowledge of space andprotecting the space environment" in "the nucleus of a strategy to address global challenges in the future". And among the actionsto be taken the action "To improve the protection of the near-Earth space and outer space environments through further research in and implementation of mitiga-

tion measures for space debris was listed.

16. See UN doc. A/AC.105/C.2/2002/CRP.5.

17. See the Report of the LSC on its forty-first session, 2002, UN doc. A/AC.105/787, paras 49-50 at p. 9.

18. See ibidem, para. 51 at p.9.

19. See Workplan on space debris, UN doc. A/AC.105/C.2/L.246 dated 1 April 2003.

20. See the Report of the LSC on its forty-second session, 2003, UN doc. A/AC.105/805, paras 147-149 at p. 23.

21. See e.g. V. Kopal,"Issues involved in defining outer space, space object and space debris" in Proceedings of the Thirty-fourth Colloquium on the Law of Outer Space, IISL, October 5-11, 1991, Montreal, Canada, AIAA, p. 38 et seq.; "Space debris: a review of the current regulatory structure" in Proceedings of the Thirty-ninth Colloquium on the Law of Outer Space, IISL, October 7-11, 1996, Beijing, China, AIAA, p.343 et seq.; "Present international law principles applicable to space debris and the need for their supplement" in Proceedings of the Second European Conference on Space Debris, ESOC, Darmstadt, Germany, 17-19 March 1997, p. 739 et seq..

22. In order to resolve this question, Professor Bing Cheng suggested to establish absolute liability or presumed fault for damage caused by undisowned space debris. See his article ""Space Objects", "Astronauts" and related expressions" in Proceedings of the Thirty-fourth Colloquium on the Law of Outer Space, IISL, October 5-11, 1991, Montreal, Canada, AIAA, p.25.

23. See K.-H. Böckstiegel, The Draft of the International Law Association for a Convention on Space Debris,"/including the text of Resolution Nr.5 on Space Law of the 1994 ILA Conference and the final text of the adopted Instrument/. For substantive and procedural aspects of the discussions on this document, see M. Williams,"The ILA finalizes its international instrument on Space Debris in Buenos Aires, August 1994", in Journal of Space Law, 1995, p.47 et seq..

24. See the UN Technical Report on Space Debris, 1999, UN doc. A/AC.105/720, p.2; IAA Position Paper on Orbital Debris, Edition 2001, p.3; Inter-Agency Space Debris Coordination Committee space debris mitigation guidelines, UN doc. A/AC.105/C.1/L.260, p.5 and other documents.

25. For this purpose, the ILA Draft Convention on the Settlement of Space Law Disputes, as elaborated in 1984 and revised at the 68th ILA Conference in Taipei, 1998, shall be applied unless a Party to the Instrument on Space Debris has excluded such application. The text of the ILA Draft Convention on the Settlement of Disputes /as amended in 1998/ see in the Report of the Sixty-eighth ILA Conference, 1998, p.249 et seq..

26. See its text in United Nations Legislation Series, National Legislation and Treaties Relating to the Law of the Sea, UN doc. ST/LEG/SER.B/16, New York, 1974, p.439 et seq..

27. See The Law of the Sea, United Nations Convention on the Law of the Sea with Index and Final Act of the Third United Nations Conference on the Law of the Sea, United Nations, New York, 1983, pp.19-20 and 29.

28. See the preambular para. 4 of the 1967 Outer Space Treaty.