SOME CONSIDERATIONS ON THE LEGAL STATUS OF AEROSPACE SYSTEMS

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In his book "The Law of Outer Space," which was published in 1972, Judge Lachs assessed the development of international law of outer space and his own experience of law-making in this particular field. Moreover, he drew a number of general conclusions relating to the role of law in modern society. He was well aware that some chapters of international law remained unfinished, some required rewriting, while the writing of others has not even begun. He warned that the gap was increasing, adding at the same time:

> Yet international law is not doomed to stay behind. For while it is essential that it should build on the foundations already laid, it may not remain past-oriented, myopic or parochial. It can move in good time, if there is an organized effort on the part of States, commensurate - and integrated - with the progress they have achieved in another sphere: that of science and technology. A continuous dialogue between scientists and jurists would facilitate the reduction of the gap.[1]

The launchings of the first man-made satellites into outer space, which were followed by a growing number of objects, both manned and unmanned, sent into orbit around the Earth, to the Moon and other planets of our solar system, gave birth to principles and norms governing these activities, which established the present legal regime of outer space. The ever continuing progress in space science and technology, accompanied by applications of these results for the benefit of humankind, has led to further elaboration and improvements of the up-to-date space legal order, as evidenced, *e.g.*,by adoption of principles relating to international direct television broadcasting, remote sensing of the Earth from outer space and the use of nuclear power sources in outer space during the last decade. This development is far from being finished, notwithstanding the problems that have arisen in the societal, economic and financial background of further projects in space, and also due to the existing differences in political approaches to the international law-making itself. At the same time, scientific discoveries and technological achievements shed a new light on the legal solutions already adopted and amplify their meaning.

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1 M. LACHS, THE LAW OF OUTER SPACE. AN EXPERIENCE IN CONTEMPORARY LAW MAKING 150 (Sijthoff 1972).

Aerospace Systems - A Possible Subject of Further Development of Space Law

The appearance of new space transportation systems in recent years and the plans for further types of aerospace craft to be built in a foreseeable future offer an example for such impetuses and attract the interest of space lawyers. In connection with the construction of the first multipurpose reusable space vehicles, in the movement of which, essentially based on principles of astronautics, some elements of air flight were also used in the final stage of their missions, and still more after the disclosure of different designs of future systems which might combine to a greater extent elements of aeronautics and astronautics, the compatibility of these new apparatuses with the present legal regimes of airspace and outer space, and the needs for their further development, have become subjects of attention of space lawyers. Professor Gorove, having characterized earlier the space shuttle on the basis of its purpose and functions as an object to which space law should be applied, recommended in his article published in 1988, in which he identified the main issues relating to the aerospace plane for the first time, that "all relevant international agreements should be closely scrutinized to determine in what way or under what circumstances they would or would not apply to the aerospace plane. The same holds equally true for domestic laws and regulations."[2]

In 1991, an International Colloquium on "The Spaceplane and the Law" was organized be the French Society for Air and Space Law (La Société Francaise de Droit Aérien et Spatial) with the help of the European Space Agency (ESA) and the National Centre for Space Studies (CNES) in Paris. The Colloquium was first informed by experts about different projects in this field and then concentrated on two categories of issues: conditions of use of aircraft, and problems of liability including liability of operators and liability of the manufacturer and insurance company. The results of the Colloquium were published in the same year.[3]

Finally, at the intergovernmental level, "Questions concerning the legal regime for aerospace objects" became subject of discussions in the Legal Subcommittee of COPUOS, which started consideration of these issues upon the initiative of the Russian Federation under the scope of agenda item "Matters relating to the definition and delimitation of outer space and to the character and utilization of the geostationary orbit, including consideration of ways and means to ensure the rational and equitable use of the geostationary orbit without prejudice to the role of the International Telecommunication Union."[4] A preliminary exchange of views on this

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2 S. Gorove, *Legal and Policy Issues of the Aerospace Plane,* 16 J. SPACE L. 147, at 155 (1988).

3 180 REVUE FRANCAISE DE DROIT AÉRIEN AT SPATIAL (RFDAS) 427-570 (1991).

4 UN Doc. A/AC.105/C..2/L.189 (30 March 1992).

subject was conducted in the Working Group on delimitation and the geostationary orbit already in 1992 at the Thirty-first session of the Legal Subcommittee[5] and this discussion was further developed in the same body at the Thirty-second session of the Subcommittee in 1993.[6] At the latter session of the Working Group, its Chairman circulated an informal paper entitled "Draft questionnaire concerning aerospace objects"[7] that he prepared as a starting point for the preparation of a questionnaire to be sent to Member States which was then commented upon by a number of delegations.

All these papers and discussions, though still preliminary and general to some degree, offer a sufficient basis for an attempt to offer in this contribution an overview and, at least, a partial analysis of the issues involved with the view of facilitating a further discussion on this interesting subject.

Present and Future Aerospace Systems

The consideration of legal issues of aerospace systems must be preceded by a brief factual summary. Let us be reminded that this notion covers different types of aerospace vehicles, some of which have already been operative, the others are in the state of designing and planning.[8]

The first type is well represented by the US Space Shuttle which has been in operation since 1982, and also by the Russian Buran which, however, is in store for the time being. The French Hermes and the Japanese Hope will also belong to this category. All these systems are, or should be, launched by rocket carriers for missions in outer space; having completed these missions, they return, or should return, to earth surface as gliders and land at extended runways of airports.

The second type would be based on the idea of a horizontal take-off and landing at conventional runways, thus using the air-breathing engines and becoming fully reusable. The British HOTOL Projects, the future of which seems to be uncertain, and the German Sänger Project represent this

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5 Report of the Legal Subcommittee on the Work of its Thirty-first Session (23 March - 10 April 1992), UN Doc. A/AC.105/514, at 20-23 (20 April 1992).

6 Report of the Legal Subcommittee on the Work of its Thirty-second Session (22 March - 8 April 1993), UN Doc. A/AC.105/544, at 14-16 (15 April 1993).

7 UN DOC. A/AC.105/C.2/1993/CRP.1 (29 March 1993) *in* UN Doc. A/AC.105/544, Appendix, 20-21 (15 April 1993).

8 A factual basis for a legal discussion was offered by a number of papers submitted to the First National Conference on Hypersonic Flight in the 21st Century held at the University of North Dakota, Grand Forks, North Dakota in 1988 and, later, by contributions made during the first part of the Paris Colloquium in 1991. *See* PROC. FIRST NATIONAL CONFERENCE ON HYPERSONIC FLIGHT IN THE 21ST CENTURY 28-148 (M.E. Highbee & J.A. Vedda eds., 1988) and 180 RFDAS 435-479 (1991). The basic facts relating to the aerospace systems were also recalled in some interventions during the discussions on this subject at the UN Legal Subcommittee.

type of vehicles. During the ascending and descending parts of their flights, these vehicles should be capable of flying at subsonic, supersonic and hypersonic speeds, while for their missions in outer space, which would be relatively short, rocket propulsion would be applied.

Another version of this type would be based on the use of a heavy aircraft carrier for taking-off and the first stage of the flight in airspace, from which the aerospace vehicle will separate at a certain height. An originally Russian project[9] and a possible configuration of the British HOTOL vehicle and the Russian aircraft Antonov may be recalled as examples.

An advanced vehicle which would fly as an aircraft for most of its flight at hypersonic speed, and be also capable to move at a fractional or even full orbit, returning back to airspace and landing at a conventional airport, would be the third and most ambitious type of aerospace systems. The United States National Aerospace Plane (NASP) program, which should "develop and demonstrate hypersonic technologies with the ultimate goal of single stage to orbit" and whose flight path would lead "from the runway through the air-breathing corridor to low Earth orbit and back," is the best example of this type. For the time being, the NASP remains a "research and technology development plane" and this process should continue "until the stated purposes are achieved and until the ultimate single-stage-to-orbit capability is shown.[10]

In conclusion of this factual summary it may be said that all these present and future projects have a common denominator in the utilization, to different extents, of aeronautical and astronautical elements which enable the aerospace vehicle to fly in airspace and to move in outer space. At the same time, however, it must be recalled that they have to serve purposes which are not identical. It may be observed that with the exception of the NASP, which seems to be destined mostly for earth-to-earth missions, all other aerospace systems shall provide transportation between earth and outer space. The essential purpose of these vehicles remains in the field of exploration of outer space, not in the field of international transport for commercial reasons which, on the other hand, could be inaugurated by means of the NASP type aerospace system. At the same time, it is to be noted that the aerospace vehicles of the Space Shuttle type have at least one common feature with the other aerospace systems, including the NASP, namely the return to atmosphere and landing at an airfield. This was observed at the Paris Colloquium by the NASA General Counsel who also said:

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9 At the Paris Colloquium in 1991 Professor Vereshchetin described in greater detail a project of G. Lozino-Lozinsky and his team, which intended to combine the AN-225 aircraft with a rocket-engine aerospace plane to be launched after its separation into orbit and return for landing at an airport. *See* V.S. Vereshchetin, *Utilization de l'avion spatial et droit de l'espace*, 180 RFDAS 517-519 (1991).

10 For all these quotations, see U.B. Mehta, *NASP and SDI Spearhead CFD Developments*, AEROSPACE AMERICA 27-29 (Feb. 1992).

> It is possible that aerospace planes will differ from present manned space vehicles by their stage of ascent, for the single stage to orbit will include the passage of air space; but as far as the stage of descent is concerned, it is possible that they will present but a tiny difference in relation to the capabilities of Hermes and Space Shuttle.[11]

Different Legal Regimes of Aeronautics and Astronautics

Having both capabilities - to fly on the basis of principles and technology of aeronautics and to move on the basis of principles and technology of astronautics - the aerospace systems thus represent instrumentalities which challenge the existing dichotomy in the development of two different legal orders relating to the two categories of activities in the space surrounding our planet. For up to present time, the law governing aeronautics and the law governing astronautics substantially differ both in their essential principles and in their specific rules. With regard to their possible applications to the aerospace vehicles, they particularly differ in some areas which were pinpointed by Judge Guillaume in his concluding remarks at the 1991 Paris Colloquium.[12]

(a) Registration

The first area relates to registration of aircraft and space objects.

According to the Chicago Convention on International Civil Aviation of 7 December 1944 [13] which is, however, applicable only to civil aircraft and not to state aircraft, including aircraft used in military, customs and police services, aircraft have the nationality of the State in which they are registered. An aircraft cannot be validly registered in more than one State, but its registration may be changed from one State to another. Except this special case of change of nationality, an aircraft is thus to be registered once for all the period of its future flights. The registration or transfer of registration of aircraft are governed by the laws and regulations of contracting States. Every aircraft, however, which is engaged in

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11 "Il se peut que les avions aérospatiaux se distingueront des véhicules spatiaux habités actuels par leur phase ascensionnelle, l'étage unique de mise en orbite comportant la traversée de l'espace aérien; mais en ce qui concerne la phase de descente, il est probable qu'ils ne présenteront qu'une différence infime par rapport aux capacités d'Hermès et de la Navette". (E.A. Frankle, *Exemple de la navette spatiale américaine,* 180 RFDAS 489-490 (1991) - Translation of this and other quotations from the French original have been made by V. Kopal.

12 G. Guillaume, *Conclusion générale sur le régime juridique de l'avion spatial,*180 RFDAS 563-568 (1991).

13 The Chicago Convention entered into force on 4 April 1947. See its text *in* Lord MCNAIR, THE LAW OF THE AIR, Appendix 2, 398*ff.* (3d ed., Stevens and Sons 1964).

international air navigation, shall bear its appropriate nationality and registration marks. No formal central register, in which the relevant data concerning aircraft of all nationalities would be recorded, has been established. The Chicago Convention only provides for reports of registrations including information concerning the registration and ownership of any particular aircraft registered in that State to be supplied by each contracting State on demand to any other contracting State or to the International Civil Aviation Organization (ICAO). Moreover, contracting States are obliged to furnish reports to the ICAO under its regulations, giving pertinent data concerning the ownership and control of aircraft registered in these States and habitually engaged in international air navigation. These data are again available on request to other contracting States.

On the other hand, the United Nations Convention on Registration of Objects Launched into Outer Space of 14 January 1975[14] provides for registration of each space object for purposes of its identification by means of an entry in a registry to be maintained by the launching State. At the same time, however, the Secretary-General of the United Nations, who must be informed on the establishment of all national registries, maintains "a Register" in which the information on essential data relating to the space objects as provided in the Registration Convention are recorded. In fact, this central Register is a collection of announcements from the part of launching States which have been published as documents of the United Nations and distributed to all its Members. In this way, full and open access to the information in this Register has been ensured. Unlike the 1944 Chicago Convention, the 1975 Registration Convention does not provide for any obligation of marking of space objects. This issue was also under discussion during the negotiations on the Registration Convention, but the idea of an obligatory marking was not adopted.[15] Instead, a compromise solution was inserted in Art. V of this instrument, according to which whenever a space object launched into Earth orbit or beyond is marked with the designator or registration number, or both, the State of registry shall notify the Secretary-General of this fact when submitting the information regarding the space object for the UN Register. In such case the UN Secretary-General shall record this notification in the Register.

Now the question is whether the aerospace vehicle should be registered as an aircraft in accordance with the Chicago registration system, or as a space object in accordance with the UN registration system. In the case of the Space Shuttle this question was already considered and clarified in connection with the construction of this reusable transportation system, which has been defined by the US authorities since

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14 The Convention entered into force on 15 September 1976. See its text *in* THE UNITED NATIONS TREATIES ON OUTER SPACE 22*ff.* (UN Sales No. E.84.I.10, 1984).

15 See the comparative table of provisions in the text of proposals submitted on the Draft Convention on Registration of Objects Launched into Space for the Exploration and Use of Outer Space, UN Doc. A/AC.105/C.2 (XII) Working Paper 1, 6, and 8.

its first launching as spacecraft and has been also registered as such.[16]

In addition to the differences relating to registration, issues concerning documents to be carried by the instrumentality concerned should be recalled. According to the 1994 Chicago Convention, every aircraft of a contracting State, engaged in international navigation, shall carry its certificate of registration, its certificate of airworthiness, the appropriate licenses for each member of the crew, its journey log book, and eventually the aircraft radio station license, a list of names of passengers and places of their embarkation and destination, and a manifest and detailed declarations of the cargo. In international space law, no provisions of this kind exist, these matters have been left to be regulated by internal rules of the launching State or the international space organization.[17]

(b) Legal Basis of Air and Space Flights

While some of these issues might be considered as less important and could be after all overcome in the future by a certain rapprochement of both systems either by new provisions or in practice, the second area of issues seems to be more crucial. These issues relate to the legality of flights in which both legal systems substantially differ. In principle, an aircraft moves in the airspace of a foreign State on the basis of its authorization which is granted in the case of a civil aircraft by general agreement enshrined in conventions on international civil aviation and related documents. This authorization regime is a consequence of the principle of sovereignty of States which has been reflected in the leading provision of the 1944 Chicago Convention according to which the contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory.[18] A space object, on the other hand, can be launched into outer space freely, because according to the 1967 Outer Space Treaty,[19] outer space, including the Moon and other

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16 C. Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 827-828 (1982), The same practice will probably be applied with regard to the European craft Hermes. *See* J.-L. de Montlivault, *Immatriculation et certification,* 180 RFDAS 497 (1991).

17 During the Paris Colloquium, attention was also drawn to the different positions of the commander on board an aircraft who, according to Annex 6 of the 1944 Chicago Convention, makes final decisions regarding the preparation to the flight and during all the flight, and the commander of a spacecraft who remains subordinated to the director of the flight who is situated in the space flight center on the ground. *See* C. Frantzen, *Utilization de l'avion spatial et droit aérien,* 180 RFDAS 510 (1991).

18 Articles 1, 3, 5 and 6 of the 1944 Chicago Convention. Similar provisions have been also incorporated in other civil or commercial aviation conventions and in national air laws of individual States.

19 The Treaty entered into force on 10 October 1967. See its text in the publication referred to in footnote 14, at 3*ff*.

celestial bodies, is "the province of all mankind" which is free for exploration and use by all States if the requirements set out in the Treaty are met. While no authorization for launchings of space objects from the part of other States is necessary, the question however remains whether the same conclusion can be made if a space object must pass through the airspace of a foreign State during the ascending and/or descending stages of its flight. In practice, the answer to this question has been avoided due to the fact that the launching sites are located near the sea coast or in the interior of big countries; eventually, bilateral agreements between the countries concerned are to be concluded. In theory, there has not been yet a sufficient support for the conclusion that the right of innocent passage for an ascending and/or descending space object has been generally recognized as a customary rule of international law.[20]

(c) Liability

The issues relating to the domain of international liability belong to the third group of problems arising in connection with aerospace vehicles.

In the field of air law, the liability system has been based partly on international treaties and partly on national laws. The Warsaw Convention for the Unification of Certain Rules Relating to International Transportation by Air of 12 October 1929, as amended by subsequent Protocols,[21] established detailed rules governing liability of the carrier for damage sustained in the event of the death or wounding of a passenger or any other bodily injury suffered by a passenger, if the accident which caused the damage so sustained took place on board the aircraft or in the course of any of the operations of embarking or disembarking. Similarly, the carrier became liable for damage sustained in the event of the destruction or loss of, or of damage to, any checked baggage or any goods, if

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20 V. S. Vereshchetin & G. M. Danilenko, *Custom as a Source of International Law of Outer Space,* 13 J. SPACE L. 22-29 (1985). In Professor Vereshchetin's view, in the case of re-entry into the atmosphere of an ordinary space object, States in general tacitly grant the right of innocent passage through their airspace; but he doubts that they would be willing to take the same position with regard to foreign aerospace planes. *See* V. S. Vereshchetin, *Utilisation de l'avion spatial et droit de l'espace,* 180 RFDAS 520 (1991). According to Professor Christol, "pending reaching agreement at COPUOS on the issue of definition/delimitation, it is premature to speak of the equivalent in outer space of the maritime principle of innocent passage, although it is not premature to take into account the policies served by such a principle, namely, conduct that is not prejudicial to the peace, good order, or security of the coastal State." *See* C. Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 829 (1982).

21 See its text and the texts of other instruments of the Warsaw system *in* CONFERENCIA LATINOAMERICANA SOBRE TRANSPORTE AÉREO INTERNACIONAL Y ACTIVIDADES EN EL ESPACIO ULTRATERRESTRE - LATIN AMERICAN CONFERENCE ON INTERNATIONAL AIR TRANSPORT AND ACTIVITIES IN OUTER SPACE, Universidad Nacional Autonoma de México, México - University of Leiden, The Netherlands International Institute of Air and Space Law, 14-18, 1988, Mexico D.F., Mexico.

the occurrence which caused the damage so sustained took place during the transportation by air. Moreover, the carrier became liable for damage occasioned by delay in the transportation by air of passengers' baggage, or goods. The liability of the carrier thus established has been a strict liability based on the fact of occurrence of the above mentioned events, but it permitted to liberate the carrier from this liability if he proved that he and his agents have taken all necessary measures to avoid the damage or that it was impossible for him or them to take such measures. Moreover, the court could exonerate the carrier wholly or partly from this liability in accordance with the provisions of its own law, if he proved that the damage was caused by or contributed to by the negligence of the injured person. The Warsaw Convention as amended by subsequent Protocols also established limits of compensation for different kinds of damage and settled the problems of jurisdiction which belongs to national courts of the contracting States. At the option of the plaintiff, an action for damages could be brought either before the court of the domicile of the carrier or of his principal place of business, or where he has a place of business through which the contract has been made or before the court at the place of destination. It was also provided that the questions of procedure should be governed by national laws, *i.e.*,by the law of the court to which the case would be submitted.[22]

While the Warsaw system has been adhered to by many States, an attempt at establishing a conventional system of liability for damage by aircraft on the surface has not been successful. The original Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, which was signed at Rome on 29 May 1933 and completed by the Brussels Insurance Protocol in 1938, acquired but two parties. Its new version, which was signed on 7 October 1952, having acquired only a little more than three tenths of parties, has also lacked general support. The Montreal Protocol to amend the 1952 Rome Convention, which was signed on 23 September 1978, has been again adhered to only by a few States.[23]

According to the Rome Convention, any person who suffered damage on the surface was entitled to compensation as provided by this Convention but only upon proof that the damage was caused by an aircraft in flight or by any person or thing falling therefrom. Nevertheless, no right for compensation would be recognized if the damage was not a direct consequence of the incident giving rise thereto, or if the damage resulted from the mere fact of passage of the aircraft through the airspace in conformity with existing air traffic regulations. The liability for compensation for such damage has been attached to the operator of the aircraft and, similarly as in the Warsaw Convention and subsequent

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22 More about liability of the carrier under the Warsaw system may be found *in* I. H. PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO AIR LAW 45*ff.* (Kluwer 1983),

23 See the text of the 1952 Rome Convention and the 1978 Montreal Protocol amending this Convention in the publication referred to *in* footnote 18, at 183*ff.* and 215*ff.*

Protocols, extent of liability was also established in the Rome system. Actions in accordance with the Rome Convention should be in principle brought before the courts of the contracting State where the damage occurred, but, by agreement between the respective parties to the dispute, action could be brought before the courts of any other contracting State or the dispute could be submitted to arbitration in any contracting State. Of course, the Convention has applied to civil aviation and, consequently, not to damage caused by military, customs or police aircraft.[24]

Due to the limited number of States-Parties to the Rome Convention and the subsequent Protocol, it has been left to national legislation to establish the legal basis for the settlement of disputes concerning compensation for damage caused on the surface. National laws also govern other kinds of liability - that of manufacturers of aircraft, as well as that of navigation and airport control services.

A completely different system has been established in the field of space law. The United Nations Convention on International Liability for Damage Caused by Space Objects of 29 November 1972[25] provides for absolute liability of a launching State to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight. Absolute liability means not only that a mere fact of damage caused gives rise to liability, but also that no ground for exemption from liability can be sought in *force majeure*.[26]

Furthermore, this Convention provides for liability based on fault in the event of damage caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State. In this case, the latter shall be liable only if the damage is due to its fault or the faults of persons for whom it is responsible. Also provided for is liability for damage caused to a third State or to its natural or juridical persons in the event of a collision of two space objects launched by different States, which shall then be jointly and severally liable to the third State. In harmony with the above-mentioned principles, their liability to the third State shall be absolute, if the damage has been caused on the surface of the earth or to aircraft in flight, and this liability shall be based on the fault of either of the first two States or on the fault of persons for whom either is responsible, if the damage has been caused to a space object of the third State or to persons or property on board that space object elsewhere.

As clearly stated in this Convention, it is the "launching State"

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24 More about surface damage and collisions may be found *in* I.H. PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO AIR LAW 93*ff.* (Kluwer 1983).

25 The Convention entered into force on 1 September 1972. See its text *in* the publication referred to *in* footnote 14, at 13*ff.*

26 As Judge Lachs observed: "Refuge may no longer be sought in the formulae of force majeure or act of God. In view of the intrinsic scale of the risks of modern technology, the maxim qui iure suo utitur neminem laedit, or even the requirement of due care have become inept, anachronistic". M. LACHS, THE LAW OF OUTER SPACE, *supra* note 1, at 125.

which has been made liable in all cases. This term has been defined in Art. I of the Convention as (i) a State which launches or procures the launching of a space object; (ii) a State from whose territory or facility a space object is launched.[27] For the purposes of the Convention the term "space object", which may cause the damage for which liability has been established, includes component parts of a space object as well as its launch vehicle and parts thereof. Thus this definition does not help much in deciding the question of application of this Convention to aerospace systems.[28] The Convention does not apply to damage caused by a space object of a launching State to nationals of that launching State and to foreign nationals while they are participating in the operation of that space object, or as they are in the immediate vicinity of a planned launching or recovery area at the launching State's invitation.

Unlike the liability system in air law, where liability has been attributed to private persons, the system to be applied to space activities provides for liability of international persons - States and eventually international intergovernmental organizations. It is also the intergovernmental level where claims for compensation for damage should be presented and resolved, though the States, or the natural or juridical persons they might represent are not prevented from pursuing their claims in the courts or administrative tribunals or agencies of launching States. The treatment of a liability dispute at an intergovernmental level does not require the prior exhaustion of local remedies. The intergovernmental procedure for settlement of these disputes has been established directly in the 1972 Convention which particularly provides for the establishment of a Claims Commission if no settlement of a claim is arrived at through diplomatic negotiations. Unlike the air law liability system, the 1972 Convention has not set out any limit for the amount of the compensation which the launching State shall be liable to pay for damage. The compensation should be determined in accordance with international law and the principles of justice and equity, in order to provide such reparation in respect of the damage as will restore the damaged person to the condition which would have existed if the damage had not occurred.

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27 However, this definition of the "launching State", which is also included in the 1975 Registration Convention and was drafted on the basis of the principle declared in Article VII of the 1967 Outer Space Treaty, has not been without problems. *See* C. Q. Christol, *The "Launching State" in International Space Law,* 12 ANNUAIRE DE DROIT MARITIME ET AÉRO-SPATIAL 363*ff.* (1993).

28 For further discussion of the problems of defining the notion of "space objects," see M. G. MARCOFF, TRAITÉ DE DROIT INTERNATIONAL PUBLIC DE L'ESPACE 397-473 (Ed. Univ. Fribourg Suisse1973). *See also* Bin Cheng, *"Space Objects", "Astronauts" and Related Expressions,* 34 PROC. COLLOQ. L. OUTER SPACE 17*ff.* (1991) and S. Gorove, *Toward a Clarification of the term "Space Object" - An International Legal and Policy Imperative?,* 21 J. SPACE L.11*ff.* (1993).

To Which Legal Regime Should the Aerospace Systems be Subordinated?

The central question which permeated through the whole proceedings of the 1991 Paris Colloquium reads - as formulated by Judge Guillaume - as follows: "...should the aerospace plane be subordinated to the first regime, that of air law, to the second regime, that of space law, or will it be necessary to imagine for it a new autonomous regime?"[29]

In discussions held up-to-date at different levels, two approaches to this crucial question appeared in different versions and modifications.

The first of them is basically "territorial" or "spatial," and has been held in some official documents and also defended by some scholars. For example, this position was expressed in the 1992 Working Paper of the Russian Federation in the following way: "...should the regime applicable to the flight of such an object differ according to whether it is located in airspace or outer space? In our view, the answer to that question should be in the affirmative."[30]

The "territorial" or "spatial" approach can rely on the long-standing experience of a similar solution in the international law of the sea which provides for different legal regimes applicable, on the one hand, in the territorial sea, which is subject to sovereignty of the coastal State and, on the other hand, in the high seas, which are governed by the system of freedoms. Moreover, other zones and areas have their special regimes under the present law of the sea. All these regimes have developed on the basis of the "territorial" or "spatial" approach which enabled to find proper solutions even for difficult issues of their mutual delimitations in the 1982 United Nations Convention on the Law of the Sea.[31]

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29 "...L'avion spatial relève-t-il du premier régime, celui du droit aérien, du second, celui du droit spatial, ou faut-il imaginer pour lui un régime autonome nouveau?" G. Guillaume, *Conclusion générale sur le régime juridique de l'avion spatial,* 180 RFDAS 565 (1991). A similar question was also raised in the welcoming address by ESA Director J. M. Luton (*id.* at 428) and in some of the opening words addressed to individual sessions of the Paris Colloquium, *e.g.* by I. H. Ph. Diederiks-Verschoor (*id.* at 529)and E. Braure (*id.* at 541).

30 UN Doc. A/AC.105/C.2/L.189, at 2 (30 March 1992). A similar approach was obvious from the remark of Professor Diederiks-Verschoor made at the Paris Colloquium, though she herself designated it as "functional", when she suggested that the facts should determine in which space the aerospace plane would be in the moment of the incident or collision, and consequently, which regime would be preferable [180 RFDAS 530 (1991)]. In her recent book on space law, however, the same author has been inclined to a different approach saying that "a good criterion for deciding whether air law or space law is applicable would be to determine first the purpose of the plane's voyage. If the main commitment is transport in outer space, the application of space law would be called for; if, however, activities in the airspace are the main objective, air law would be preferable". *See* I. H. PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO SPACE LAW 77 (Kluwer 1993).

31 See its text in the Law of the Sea, United Nations Convention on the Law of the Sea with Index and Final Text of the Third United Nations Conference on

The main objective which is usually raised against the "territorial" or "spatial" approach is the fact that no precise border between airspace and outer space has been agreed upon so far and these is little prospect that this issue could be solved in a foreseeable future. Moreover, it is often added that the rules of international space law are applied to space objects not only during their movement in outer space, but also in other environments. Therefore, it is necessary to decide whether the aerospace planes could be considered as space objects when they pass through airspace at the beginning and at the end of their missions.[32]

Another approach to the aerospace systems is based on the function of these vehicles which might be different in each mission. Professor Vereshchetin expressed this approach in one of the conclusions in his paper presented at the Paris Colloquium, saying:

> *Is it possible to define* a single basic *criterion* that would allow to determine whether a given aircraft or an aerospace system should be governed by air law or by space law? It is possible to suggest as a criterion the mission of the aircraft or of the aerospace system concerned: transport from one point to another point of the globe or transport Earth-orbit and orbit-Earth. On this criterion, depends indirectly the environment (airspace or outer space) in which the aerospace plane has to accomplish the substance of its mission (the other environment being used solely in transit).[33]

This approach was proposed at the same time by Professor Christol,[34] who developed on this basis an "allocative theory". He affirms that this theory provides criteria for determining in an objective manner in specific instances whether a hybrid-type vehicle is to be governed by either a mature air law or a space law regime, and also if and when both of

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the Law of the Sea, United Nations, 1983. Though not yet in force, this codification of the law of the sea has already had a great influence on the establishment of these different legal regimes and the delimitation of their spheres of validity.

32 V. S. Vereshchetin, 180 RFDAS 519 (1991).

33 "*Peut-on définir un critère* de base unique permettant de déterminer si un avion ou un système aérospatial donné est régi par le droit aérien ou par le droit de l'espace? On peut suggérer de prendre comme critère la mission de l'avion ou du système aérospatial en question: transport d'un point à un autre du globe ou transport Terre-orbite et orbite-Terre. De ce critère dépend indirectement le milieu (espace aérien ou espace extra-atmosphérique) dans lequel l'avion aérospatial est amené à exécuter l'essentiel de sa mission (l'autre milieu étant utilisé uniquement en transit). V. S. Vereshchetin, *Id.* at 523.

34 C. Q. Christol, *Legal Aspects of Aerospace Planes*, paper submitted to the International Conference on the Law, Policy and Commerce of International Air Transport and Space Activities held in Taipei, May 1991, *in* the HIGHWAYS OF AIR AND OUTER SPACE OVER ASIA 77-91 (Chia-Jui Cheng & P. Mendes de Leon eds., Nijhoff 1991),

these regimes may have applicability. In this respect, he refers to two criteria. First, legal significance must be accorded "to the ascertainable and intended purpose or purposes of the hybrid vehicle." Secondly, it must be given "to the actual effect or effects of hybrid vehicular activity." In some cases, however, reference should be made to both purposes and effects. If the purposes and effects of aerospace plane are known to involve air travel, it will be an aircraft. This contemplates travel through the air, a short time occupancy of orbital areas without going into orbit, and a return to Earth in the same mode as a conventional aircraft. If its purpose is to enter into orbit, or to transit from space into airspace for a short time followed by reentry into outer space, it would be, according to the "allocative theory," a space object and subject to the regime of international space law. Where there would be both an aviation and an outer space purpose, the authorizing (or in the case of space launch the launching) State would be responsible for the effects of subsequent activities.[35]

Professor Christol sees one of the advantages of the "allocative theory" in avoiding the formation of new aerospace legal regimes. In his opinion, such a regime would be obliged to borrow in no small parts from the existing mature regimes, while at the same time engaging in the creation of a new autonomous law for space planes. He admits, however, that as real experience is gained with a hybrid-type vehicle, its regulation may require supplementary space law with rules from air law and vice versa. In this respect, his position is similar to the view of V.S. Vereshchetin.[36]

It must be recognized that Vereshchetin's "mission criterion" and Christol's "allocative theory" have a certain advantage in a relative simplicity of the solution offered. The application of this approach would mean that only very little, if anything at all, should be changed and both different regimes, that for aeronautics and that for astronautics, could be more or less maintained as they are, at least for the near future. Those vehicles, which would serve the purpose of air transport, would be simply considered as aircraft, and those vehicles, which should fulfill the missions in outer space, would be treated as space objects, notwithstanding their temporary appearance in airspace or vice versa in outer space. Perhaps, the respective aerospace systems might be differentiated in accordance with their nature even terminologically, the first category to be called "aerospace craft," the second "aerospace objects".

On the other hand, these theories, though convincing in some aspects, have at the same time a weak spot. The determination of the mission of a hybrid-type vehicle and an allocation of its activities either to aeronautics or to astronautics require a determination of the character of

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35 C. Q. Christol, *The Aerospace Plane and the Definition and Delimitation of Outer Space, a* paper presented to Centro de Investigatión y Difusión Aeronautico-Espacial, in Montevideo, Uruguay, on 30 October 1992 (xeroxed copy, at p. 22).

36 *Id.* at 25.

these activities which is not possible without precise knowledge of the legal meaning of the notions "aircraft" and "space object", and "airspace" and "outer space." While airspace remains the central element in all definitions of aircraft, both in international conventions and in national laws, outer space where all space are objects launched, notwithstanding their purpose and duration of stay, remains the central element of the regulation of space activities. An exact awareness of the meaning of these notions and their definitions are indispensable for the consideration of the nature of different missions of aerospace vehicles and of their flights or movements in different stages of their performance.[37]

The proponents of the "mission" or "allocative" theories are aware that they cannot deny the difference between the legal status of airspace and that of outer space as well as the role of delimitation of outer space from airspace, which arises from this fundamental difference. A definition of both spaces is relevant also for application of their approach. Professor Christol, for example, considers

> that a customary rule of international space law exists fixing the boundary at the lowest safe perigee employed both in the past and at present by space objects. If this view were generally accepted - and there has been much support for it - it would confirm the proposition that there are two separate legal regimes, e.g., one for air and another for space activities. This fact would allow an "allocative theory" to apply to hybrid-type vehicles.[38]

The same author also admits the application of the system of air law to all aerospace vehicles in the descent stage of their flights which would raise, in addition to the definition of "airspace" and "outer space," the problems of "innocent passage" when he writes:

> In these circumstances it should not be anticipated that States will forego their commitments to national sovereignty in their superjacent airspace. Since there is no principles or rule in international air law allowing foreign aircraft to transit through national airspace, unless an international agreement so provides, it is to be expected that a hybrid-type vehicle in its aircraft landing mode will be obliged to conform to the duty to obtain express permission to engage in this flight pattern. The

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37 Hence the importance of efforts of the IAF International Institute of Space Law initiated by Professor S. Gorove to discuss in greater detail definitional issues in space law as demonstrated by the first consideration of this subject at its 1991 Colloquium in Montreal. 34 PROC. COLLOQ. L. OUTER SPACE 3*ff.* (1991). *See also* S. Gorove, *Major Definitional Issues in the Space Agreements*, 35 PROC. COLLOQ. L. OUTER SPACE 76*ff.* (1992).

38 *Id.* at 20.

"allocative theory" would simply apply the regime of air law to this kind of event. Innocent passage is not a matter of right in international air law.[39]

Finally, it should not be forgotten that the two legal regimes to be applied to an aerospace system in accordance with the mission differ in the degree of their "maturity" and particularly in the scope of their applicability. While air law has essentially developed as the law governing civil aviation and its most important instruments do not apply to state aircraft, the international law of outer space governs any kind of space activities, be they performed for peaceful or for military purposes. Moreover, most of the space objects launched into outer space, including the space shuttle type of vehicles, are State owned and this will probably be also the case of the future aerospace systems, at least in the early stage of their operations.

What Legal Action Might be Taken?

The discussion on the legal status of the aerospace systems, which started a few years ago, is far from being finished and will certainly continue in conjunction with the progress in the development and construction of these vehicles. The up-to-date knowledge of different models of these vehicles leads to the conclusion that only some of them mean a real *novum* in comparison with the multipurpose reusable space vehicles which already exist or are under development (Space Shuttle, Buran, Hermes).

Under the present circumstances, when expenditures for aerospace research and development projects are constrained for general economic and financial reasons and when the impetus of political-strategic interests in this respect is weakening, it would not be realistic to assume that new aerospace systems will be in operation soon. Some of the suggested models will disappear and the development of those retained will probably be slower than their optimistic designers originally hoped. The experience with the project of the space station Freedom and its present transformation into a more modest model could lead to a rational conclusion: Why could the main space faring nations not strive for developing one model of the aerospace plane of the future in mutual cooperation? Such cooperation might be initiated in due time when national research activities will have prepared a number of options.

Under these circumstances, a legal regulation of aerospace systems does not appear to be as impending as it was originally thought. It was possible to start using the multipurpose reusable space transportation systems of the shuttle type, which are in fact the first generation of aerospace systems, without any change of the existing legal regimes the regulation of which has been based partly on a "spatial" and partly on a

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39 *Id.* at 25-26.

"functional" concept. Both these regimes will further develop and it is possible to imagine a certain rapprochement between them or even their partial unifications. This concerns, *e.g.*, the present different requirements and methods of registration of aircraft and space objects, and the documents they should carry on board. It is also possible to expect that for practical solutions of those problems raised by aerospace systems, which are more or less identical with those arising in air transport, the existing elements of air law will be used.[40] On the other hand, it is hard to believe that both legal regimes will converge in one aerospace regime governed by a single system of aerospace law in a foreseeable future.

Neither is it possible to expect that under existing conditions, the international community will be inclined to start negotiating a special convention which would bring a complete set of legally binding rules to govern aerospace systems and resolve all relevant legal problems of the use of such vehicles. However, in connection with the future progress in construction of aerospace systems, it would be possible to attempt at drafting a set of principles relevant to the use of these vehicles, which would be declared in a resolution of the United Nations General Assembly, as was done, for example, with regard to the use of nuclear power sources in outer space.[41] This recent experience has demonstrated that it is possible to regulate in this way even fairly complex problems and to find appropriate solutions of questions relating to different stages of flight and operation of the vehicles concerned. Moreover, these problems may remain under consideration even after the adoption of such principles in order to adjust them to the results of further progress in this area. The principles relevant to the nuclear power sources have been elaborated in a close cooperation between space scientists and technologists and space lawyers, and this pattern should be also used if the principles relevant to aerospace systems are discussed and agreed upon. Only later, when the real operation of aerospace systems would demonstrate which of the original issues should survive and which new problems might appear, the elaboration of a legally binding instrument governing these activities could be attempted.

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40 As Professor Böckstiegel observed at the Paris Colloquium: "For an effective elaboration of adequate legal rules for the aerospace plane, it will be necessary to apply some elements of air law and of space law, or to borrow them, even if most of these problems will continue to belong either to air law or to space law." "Afin d'élaborer de manière fonctionnelle des règles juridiques adéquates pour l'avion spatial, il faudra appliquer des éléments du droit aérien et du droit spatial, ou leur en emprunter, même si la plupart des problèmes continueront de relever soit du droit aérien soit du droit spatial." *See* 180 RFDAS 486 (1991).

41 Principles Relevant to the Use of Nuclear Power Sources in Outer Space, General Assembly resolution 47/68 of 14 December 1992. See its text (the final draft) *in* Report of COPUOS, UN Doc. A/47/20, at 25 (1992).