

JOURNAL

OF

SPACE

LAW

VOLUME 22, NUMBERS 1 & 2

1994

JOURNAL OF SPACE LAW

A journal devoted to the legal problems arising
out of human activities in outer space

VOLUME 22

1994

NUMBERS 1 & 2

EDITORIAL BOARD AND ADVISORS

BERGER, HAROLD
Philadelphia, Pennsylvania

GALLOWAY, EILENE
Washington, D.C.

BÖCKSTIEGEL, KARL-HEINZ
Cologne, Germany

GOEDHUIS, D.
London, England,

BOURÉLY, MICHEL G.
Luzillé par Bléré, France

HE, QIZHI
Beijing, China

COCCA, ALDO ARMANDO
Buenes Aires, Argentina

JASENTULIYANA, NANDASIRI
Vienna, Austria

DEMBLING, PAUL G.
Washington, D. C.

KOPAL, VLADIMIR
Prague, Czechoslovakia

DIEDERIKS-VERSCHOOR, I.H. PH.
Baarn, Holland

MCDUGAL, MYRES S.
New Haven, Connecticut

FASAN, ERNST
Neunkirchen, Austria

VERESHCHETIN, V.S.
Moscow, U.S.S.R.

FINCH, EDWARD R., JR.
New York, N.Y.

ZANOTTI, ISIDORO
Washington, D.C.

STEPHEN GOROVE, Chairman
University, Mississippi

All correspondence should be directed to the JOURNAL OF SPACE LAW,
P.O. Box 308, University, Mississippi 38677. Tel. 601-234-2391. Fax:
601-232-7010.

The subscription rate for 1994 is \$74.45 (domestic) and \$79.95
(foreign) for two issues combined. Single issues for other years may be
ordered at \$40 per issue (postage and handling included).

Copyright © JOURNAL OF SPACE LAW 1994

Suggested abbreviation: J. SPACE L.

JOURNAL OF SPACE LAW

A journal devoted to the legal problems arising
out of human activities in outer space

VOLUME 22

1994

NUMBERS 1 & 2

CONTENTS

Announcement	iv
Judge Manfred Lachs: An Obituary (<i>I.H.Ph. Diederiks-Verschoor</i>)	1

ARTICLES

Regulation of Space Salvage Operations: Possibilities for the Future (<i>N. Jasentuliyana</i>)	5
The International Telecommunication Union and Development (<i>Francis Lyall</i>)	23
Judge Manfred Lachs and the Principle of <i>Jus Cogens</i> (<i>Carl Q. Christol</i>)	33
Human Settlements on Planets; New Stations or New Nations (<i>Dr. Ernst Fasan</i>)	47
Some Considerations on the Legal Status of Aerospace Systems (<i>Vladimir Kopal</i>)	57
Liability of Aerospace Manufacturers: <i>MacPherson v. Buick</i> Sputters into the Space Age (<i>Phillip D. Bostwick</i>)	75
The Role of ESA in the Evolution of Space Law (<i>Gabriel Lafferranderie & Paul Henry Tuinder</i>)	97

SPECIAL FEATURES

Events of Interest	115
A. Past Events	115

Reports

The 1994 Session of the Scientific and Technical Subcommittee of UNCOPUOS Takes Place in a Constructive Atmosphere - Space Debris Issue for the First Time on its Agenda (<i>Matthew W. Sanidas</i>)	115
---	-----

1994 Session of U.N. Legal Subcommittee on Space Reasonably Successful (<i>Jitendra S. Thaker</i>)	120
Issues of Supreme Authority and Sovereign Rights Arising out of Space Activities (<i>Stephen Gorove</i>)	126
Space-Related Legislative Initiatives and Policy Developments (<i>Pamela L. Meredith & William D. English</i>)	132
United Nations Committee on the Peaceful Uses of Outer Space Holds Annual Meeting in Vienna, Austria (<i>Mathew W. Sanidas & Jitendra S. Thaker</i>)	135

Case Notes

<i>Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corporation (COMSAT)</i>	141
<i>Smith v. United States & Hughes Aircraft Co. v. U.S.</i>	142

Short Accounts

Implementation of the ESA Convention - Lessons From the Past (<i>Elisabeth Back Impallomeni</i>)	144
Asia Booms in Space! (<i>Frans G. von der Dunk</i>).	147
Legal Questions Regarding Commercial Activities in Outer Space (<i>Dr. Ernst Fasan</i>)	149

<i>Congressional Notes.</i>	152
<i>Executive Developments</i>	152
<i>International Developments.</i>	153
<i>Manfred Lachs Space Law Moot Court Competition</i>	154
<i>Other Events</i>	154
<i>Brief News</i>	155

<i>B. Forthcoming Events</i>	156
------------------------------	-----

Book Reviews/Notices	159
-----------------------------	-----

Diederiks-Verschoor, I.H. Ph., An Introduction to Space Law (<i>Stephen Gorove</i>)	159
van Traa-Engelman, H.L., Commercial Utilization of Outer Space (<i>Stephen Gorove</i>).	159
Masson-Zwann, Tanja L./Mendes de Leon, Pablo M.J., Air and Space Law: de Lege Ferenda - Essays in Honour of Henri A. Wassenbergh	161
Santy, Patricia A., Choosing the Right Stuff: The Psychological Selection of Astronauts and Cosmonauts	161
Stuhlinger, Ernst/Ordway III, Frederick I., Wernher von Braun - Crusader for Space	162

United States Space Foundation, Proceedings Reports on the Sixth, Seventh, Eighth and Ninth Space Symposiums	162
Mauldin, John H., Prospects for Interstellar Travel	163
Recent Publications	164
Books	164
Contributions to Books	164
Articles	165
Reports	166
Notes/Comments	167
Case Notes	167
Short Accounts	167
Book Reviews/Notices	168
Official Publications	169
Cases	171
Miscellaneous	171
Current Documents	175
Guidelines for U.S. Implementation of the Agreement Between the U.S. and the Russian Government Regarding Inter- national Trade in Commercial Space Launch Services	175
Status of International Agreements Relating to Activities in Outer Space (as of March 1994)	183
U.S.-Russian Joint Commission on Economic and Technological Cooperation - Joint Statement on Space Station Cooperation	200
Index to Volume 22	202

Announcement

As a respectful follow-up to Professor Stephen Gorove's "In Memoriam" remarks* honoring the *Late Judge Manfred Lachs*, many of the Judge's friends and admirers in the space law field wished to pay tribute to his memory by their writings. To accommodate all the contributions in a single commemorative volume, the JOURNAL OF SPACE LAW combined its 1994 issues in one joint publication.

* 21 J. SPACE L. I (1993).

JUDGE MANFRED LACHS: AN OBITUARY

Manfred Lachs was one of those personalities whose intellectual abilities and engaging manner never failed to impress, and whose death caused much regret not only in a wide circle of international lawyers, but also among those who had the privilege of knowing him during his career as a diplomat or elsewhere. With his demise, on January 14, 1993, in The Hague, where he was still active as a Judge of the International Court of Justice, the community of international lawyers has lost one of its outstanding members.

Manfred Lachs was born in 1914 in Stanislaw, Poland. In 1937 he took his degree of Doctor Juris at the University of Cracow, did postgraduate studies in Vienna and Nancy and then went to London, avoiding and surviving the Nazi occupation of his native country, where all his family was killed.

In London, Lachs attended courses at the London School of Economics, but he soon found himself engaged in other activities, doing his military service and joining the Polish Government in exile. It was during this period that he wrote his book on war crimes (1945). In 1946, he was appointed Legal Adviser to the Polish Delegation at the Paris Peace Conference.

After World War II, Lachs's career can be clearly divided into several parts: the first as a diplomat, the second as a scholar and professor, lecturing and writing, and the third as a Judge of the International Court of Justice. As a diplomat, he served his country in the capacity of Minister Plenipotentiary during the late Fifties, and as Legal Adviser to the Polish Ministry of Foreign Affairs from 1960-1966. The second part of his career saw him as a Professor of Political Science and International Law at the University of Warsaw. He also went lecturing at universities all over the world, many of them honoring him with a degree *honoris causa*.

What attracted his special attention to the field of international law were the settlement of disputes and arbitration. As early as 1949, he was already a member of the Arbitral Tribunal for the Interpretation of the Constitution of UNESCO, and since 1956 a member of the Permanent Court of Arbitration. He also devoted a great deal of his attention and energy to the work of the United Nations and when the start of the space age captured his imagination, he took a keen interest in space law right from the beginning. From 1962-1966, he was Chairman of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, where he exercised considerable influence during the drafting of the Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1967, the Treaty that is the cornerstone of space law. More than 20 years later his book, 'The Law of Outer Space' (Leiden, 1972), has lost little or none of its actuality, not only because of the philosophical elements it contains, but because of his prognostics of future developments. In 1992, not long before

his death, he told me that he intended to write another book on space law, but with a special emphasis on its unique characteristics and structures and on mapping out policies for the future.

In 1967, yet another important function was taken on by Lachs when he was nominated as a Judge of the International Court of Justice. He was President from 1973-1976 and served the Court with great distinction for many years, becoming its longest-serving judge. A skillful and experienced man, he provided most valuable comments, and his opinion was very influential. One of the cases I would like to mention was the dramatic Lockerbie case in which he expressed a dissenting opinion and made it clear that he wished political and legal issues would be handled separately.

In addition to all his other activities Lachs was also Vice-President of the Curatorium of the Hague Academy of International law. There, in 1980, he gave a memorable 3-week course on International Public Law which brilliantly reflected his profound knowledge of the fundamentals of international law. Among the subjects he treated during that fascinating course were the interpretation of law, customary law, the axiomatic 'pacta sunt servanda' rule, the origins of 'jus cogens', (Collected Courses 1980, Vol. IV, p. 201), the peaceful settlement of disputes, gentlemen's agreements of the equality of States, and even the danger of chemicals. The very variety of subjects provides some measure of the range of his powerful intellect.

Finally, to conclude the long list of functions held by this extraordinary scholar, it may be recalled that during the Congress of the International Astronautical Federation held in Dresden in 1990 Lachs was chosen as President of the International Institute of Space Law (IISL), a function which sadly ended with his untimely death. At the annual Colloquium of the IISL held in Washington in 1992 within the framework of the World Space Congress, he took the initiative to add a Moot Court to the proceedings. He chaired the Court personally, with the assistance of Judges Guillaume and Schwebel.

Throughout his career Lachs's activities have been accompanied and accentuated by a great many publications. A list of these can be found in the book of honor offered to him on the occasion of his 70th birthday. He was a great author who could write on all sorts of topics. One of his works was 'The Teacher in International Law', which was awarded the ASIL prize in 1982 and was translated into French under the title: 'Le monde de la pensée en droit international,' with new facts added to the 1989 edition. It is a gold mine of information on sources and trends of international law as well as its teachers during the whole history of the entire world. In 1991, when the IISL Colloquium was held in Montreal, I had the privilege to attend Lachs's masterly lecture at the International Institute of Air and Space Law of McGill University. His subject was the creation of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, a creation which owed a great deal to his diplomatic skill and human personality. His exposé was absolutely riveting.

Judge Lachs had a wide scope and thorough knowledge of international law, but, beyond that, he had a very exceptional human personality. He was always ready to let people avail of his good advices and his sense of humor was generally admired. When I once referred to his sense of humor, he said to me: "We need that, life is difficult enough." The students benefited from his interests regarding them. He presided for many years over The Telders International Moot Court Competition in the Peace Palace.

Coming from a communist country and well-known for his moderation and generous views Judge Lachs enjoyed the confidence of both Western and Eastern countries. His thorough knowledge of several languages made it easy for him to communicate his valuable thoughts, and this, combined with his warm and amiable personality, has brought him the friendship of many. He will be sadly missed by all.

I.H.Ph. Diederiks-Verschoor
President Emeritus, IISL

REGULATION OF SPACE SALVAGE OPERATIONS: POSSIBILITIES FOR THE FUTURE

N. Jasentuliyana*

I. Introduction

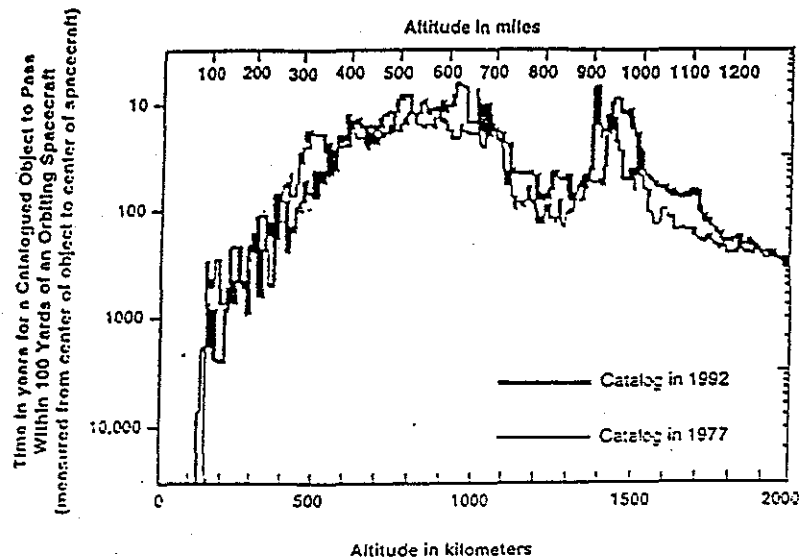
The portion of outer space surrounding the Earth in which satellites are used for Earth-based activities, such as telecommunications and Earth observation among others, has boundaries only in the sense that these satellites must be placed in specific orbits which are best suited to the function of a particular satellite. These orbits, whether in the geostationary orbit, in low Earth orbit or an elliptical orbit, are chosen based on the activity to be performed by the satellite and can be high, low or anywhere in between. Economically speaking, the higher the desired orbit, the higher the cost of placement of a payload in outer space will be. Research and development, launching, and placement of satellites into desired orbits cost money. Hence, payloads are placed in the lowest possible orbit where they may adequately perform their functions in the manner intended. Space activities, like most projects, are therefore planned in terms of cost. To place a payload in orbit, costs such as launching and placement must be calculated to determine whether the expected benefits of the planned space activity outweigh the costs.

Specific orbits around the Earth such as the geostationary orbit, low Earth orbits and elliptical orbits are more desirable than others because of both their acceptable positions for certain space activities (such as telecommunications and Earth observation), and the operational costs associated with placement of payloads into these orbital positions. Moreover, certain segments of these specific orbital arcs are also in high demand. With higher demand comes higher use and hence, the creation of more orbital debris resulting from the launching of satellites and other space objects into these already crowded orbital positions. It is in these specific orbits that orbiting spacecraft have higher chances of passing within 100 yards of orbiting artificial objects (see figure 1).

* Director, Office for Outer Space Affairs, United Nations, Vienna, and President of the International Institute of Space Law. This article reflects the personal views of the author and not necessarily those of any organizations with which he is affiliated. The author wishes to acknowledge the assistance provided by Matthew Sanidas in the preparation of this article.

FIGURE 1

Rate that a Catalogued Object is Expected to Pass
within 100 Yards of an Orbiting Spacecraft

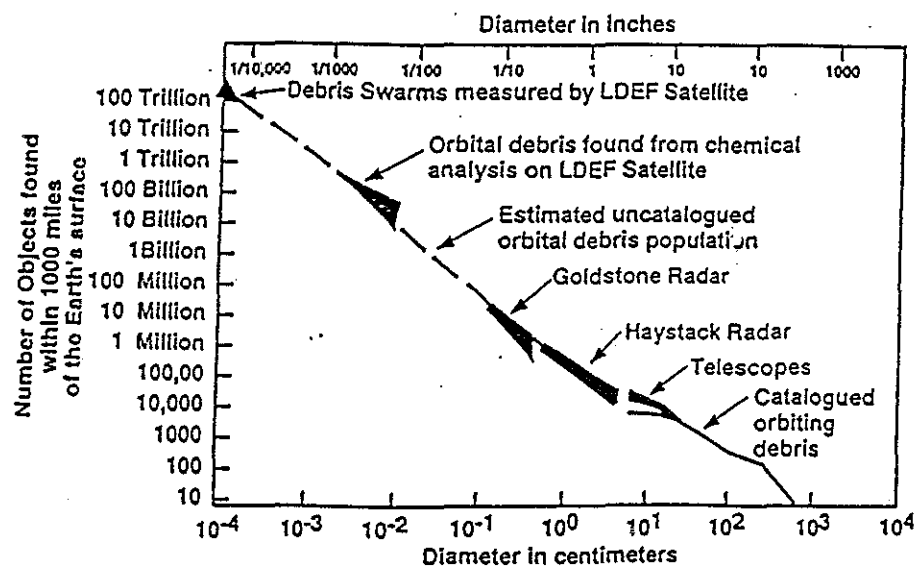


Source:

D. Portree and J. Loftus, *Orbital Debris and Near-Earth Environmental Management: A Chronology*, (National Aeronautics and Space Administration: 1993), at p. 2.

FIGURE 2

Number of Objects in Low Earth Orbit
as Estimated from Various Measurements



Source:

D. Portree and J. Loftus, *Orbital Debris and Near-Earth Environmental Management: A Chronology*, (National Aeronautics and Space Administration: 1993), at p. 3.

Furthermore, in the Earth-orbital regions most used by humans, if the number of orbiting objects was limited to that which has been previously catalogued, it would already constitute the beginning of a crowding problem. Approximately 23,000 orbiting artificial objects have been catalogued in the past three decades. Of these, 7,200 remain aloft. Objects in space seldom remain the same as they would on the ground. They actually create debris. It is estimated that for every trackable object, 20 untrackable 1 centimeter objects and 10,000 untrackable 1 millimeter objects are created. Because only objects of a certain size can be catalogued, only estimates can be made on the actual number of objects that exist in orbit. (See figure 2).¹

The use of all three types of space orbits will continue to be in high demand for certain space activities. Consequently, continued space activities involving the launching of satellites and other space objects can only increase the number of satellites (and orbital objects created from their launching) already existing in these orbits. In this sense, low Earth, geostationary and elliptical orbital slots around the Earth are limited. These orbits are therefore valuable to those States and private parties wishing to use space for certain space related activities. To utilize space resources equitably in order to preserve outer space for future users and to lessen the possibility of disastrous space collisions,² it is essential to develop mechanisms for the concrete and comprehensive management of space.

In light of increasing public awareness of the state of the global terrestrial and space environment, there has been much discussion and debate on the overcrowding of space and the resultant creation of orbital debris. Because all nations of the world enjoy an equal right of access to space, overcrowding of orbits in space is a topic of interest to all countries and especially those that have not yet entered into the realm of outer space activities. States already engaged in space activities are expected to maintain space in a way that would not be detrimental to the interests of States, who in the future, may want to conduct space activities.³ In fact,

¹ D. Portree and J. Loftus, *Orbital Debris and Near-Earth Environmental Management: A Chronology*, at 1 (NASA 1993). It must also be noted that billions of tiny aluminum particles sprayed by solid rocket motors and clouds of snowflakes formed from waste water are produced by the Space Shuttle. Because the smallest trackable item is about 10 centimeters across, these items are also too small to be detected by conventional tracking techniques. *Id.*

² It is interesting to note that all objects in space have the potential to collide and cause great amounts of damage to other space objects. The average speed of collision in LEO is about 10km/sec. It is simple physics to calculate that a 1 centimeter object with a mass of a few grams traveling at such high speeds has as much force as that of a 250 kilogram object traveling at 100 kilometers per hour. See generally *id.*

³ See Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, art. I, opened for signature, 27 January 1967, 67 UNTS 205 (hereinafter the Outer Space Treaty). The Outer Space Treaty entered into force 10 October 1967. Article I states: "Outer space, including the Moon and other Celestial Bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies." *Id.* Moreover, article II prohibits States Parties from appropriating outer space through national sovereignty,

all States currently involved in space activities have implemented various debris mitigation and prevention techniques intended to reduce the amount of objects jettisoned into outer space during space flight. Recently, the First European Conference on Orbital debris took place in Darmstadt, Germany, where various problems and solutions associated with orbital debris were discussed and analyzed.

Both the United States National Aeronautics and Space Administration (NASA) and the European Space Agency (ESA) have in place policies that seek to minimize the creation of orbital debris. ESA has adopted requirements that are specifically meant to minimize the creation of orbital debris during ESA space programs with the ultimate goal of environmental protection. These include fuel venting and removal of spent satellites to graveyard orbits. For ESA, reorbiting to a disposal or graveyard orbit is an *interim* measure. Ultimately, removal of the satellite will need to be performed.⁴ The United States has also adopted policies to minimize the creation of orbital debris. These include measures designed to prevent launch vehicles from exploding or breaking up as well as special spacecraft design and construction to resist environmental degradation from atomic oxygen and solar radiation.⁵ Moreover, the United States has a policy of encouraging "other space-faring nations to adopt policies and practices aimed at debris minimization."⁶

The purpose of this article is to examine the legal aspects of the concept of space salvage operations (otherwise known as "astrosalvage")⁷

occupation, use or other means. *Id.*

⁴ See W. Flury, *European Activities on Orbital Debris*, in 1 PROC. EUROPEAN CONFERENCE ON ORBITAL DEBRIS, DARMSTADT, GERMANY, 5-7 APRIL 1993, at 27, 31 (1993).

⁵ U.S. Congress, Office of Technology Assessment, *Orbiting Debris: A Space Environmental Problem-Background Paper*, OTA-BP-ISC-72, at 22-23 (1990).

⁶ *Id.* at 33, citing White House Fact Sheet, "Presidential Directive on National Space Policy" (Feb. 11, 1988). In fact, this Office of Technology Assessment Background Paper goes on to state that some sort of concerted international action may be necessary in order to reduce the threat of orbital debris. See *id.* at 39. According to this report, it was appropriate for the United States to convene a working group of space-faring nations to discuss and reach agreement on mitigation efforts and then to expand those discussions to include other nations with an interest in space activities. See *Id.* At present in Japan, there are no national regulations on the management of space debris. The Government of Japan feels that it is still too early to even start considering establishment of such a regulatory framework. What is in place, however, is a process where both launching organizations in Japan, the National Space Development Agency (NASDA) and the Institute of Space and Astronautical Science (ISAS), must receive prior approval for every launch from the Space Activities Commission (SAC). In its evaluation during the approval process, the SAC considers the possibility of contamination of the space environment and the risk of damaging other spacecraft. This thorough review process to approve a launch can be considered as a way to provide good management of space debris without a fixed and specific legal framework. Information from officials from the Space Planning Division of the Japanese Science and Technology Agency and NASDA.

⁷ "Astrosalvage" is a term used by some authors to describe the possibility of salvors capturing and retrieving space objects, component parts and/or orbital debris of other launching States and then bringing a salvage claim asking for compensation for the capture and retrieval operation. See generally, 9 STUDIES IN AIR AND SPACE LAW 257-86 (K.-H. Böckstiegel ed., C. Heymanns Verlag 1990),

performed specifically to reduce the quantity of space objects, component parts and orbital debris in space. The legal framework of analysis for this article will begin with a discussion of existing space law concerning space objects, component parts and orbital debris, including a discussion on the rights and duties of launching States. In light of the potential for "astrosalvage" operations, it is also useful to consider laws and legal principles governing marine salvage operations of abandoned and derelict craft.

Although there are basic legal conceptual differences between the salvage of abandoned sea craft and the salvage of space objects, primarily due to their different technical characteristics, analyzing marine salvage law in terms of space salvage nevertheless can provide insight into possible new interpretations of the existing body of space law. The general concepts of abandonment at sea and the classification of derelict craft, therefore, may provide ideas and analogous situations to assist policy-makers in determining standards and practices for space salvage operations.

At present, the idea of "astrosalvage" as a means of space cleanup is not economically viable. In fact, although technically feasible, other potential solutions to overcrowding are less expensive and are therefore considered to be more practical in current economic terms. These include the use of higher (disposal or graveyard) orbits. However, it is possible that, in the future, a market for used space objects and used space parts may develop. Hence, commencement of international discussions on this issue in the context of space environmental maintenance would begin the process of deciding what should be accomplished to protect and preserve both the Earth and space environments for the benefit of future generations.

II. Major Provisions of International Space Law

A. Responsibility and Liability

Provisions concerning concepts of responsibility and liability of States for space activities are to be found in several treaties. Articles VI and VII of the Outer Space Treaty discuss responsibility and liability, respectively. Article VI states:

States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. ...

According to this clause, it is the responsibility of a State Party to the Outer Space Treaty to insure that any space activity carried out by

excerpts reprinted in C. Christol, *SPACE LAW: PAST PRESENT AND FUTURE* 249-261 (Kluwer 1991). See generally H. DeSaussure, *The Application of Maritime Salvage Law to the Law of Outer Space*, 28 *PROC. COLLOQ. L. OUTER SPACE* 127 (1986).

government agencies or nongovernmental entities is performed safely and in conformity with the Outer Space Treaty and existing regulations of that State. Space activities performed by non-governmental entities are also subject to continual supervision by that State Party.⁸ In case of a space salvage operation by such bodies, it would be the responsibility of the State party to the Treaty to ensure that any space salvage activity is performed in compliance with the provisions of the Outer Space Treaty and, hence, according to Article III, with international law. Therefore, before any space salvage operation was to take place, a third party wishing to perform such an operation would have to fulfill any Outer Space Treaty requirements as well as other requirements established by the State Party to the Outer Space Treaty responsible for the activities of that third party. Among the most important would be the receipt of prior authorization to perform the salvage operation from that State Party.

Article VII of the Outer Space Treaty states:

Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the earth, in air or in outer space, including the moon and other celestial bodies.

This article establishes international liability of States involved in the launching of an object into outer space which causes damage on the Earth, in air or in outer space, caused by an object launched into outer space from the territory of that State. These concepts are elaborated further in Articles II and III of the Convention on International Liability for Damage Caused by Space Objects.⁹ Article II of the Liability Convention establishes absolute liability of a launching State for damage caused by its space object on the surface of the Earth or to aircraft in flight. Article III establishes liability of the launching State for damage to another space object of another launching State if the damage is due to the fault of the former launching State or persons or entities for whom that State is responsible.

An obvious question from a legal standpoint is proof or evidence of injury. How does an injured State prove that a space object, component part or orbital debris from a space object of another launching State has caused damage to persons or property from that State? According to Article II of

⁸ Outer Space Treaty, *supra* note 3, art. VI.

⁹ Convention on International Liability for Damages Caused by Space Objects, opened for signature 29 March 1972, 961 UNTS 187 (hereinafter the Liability Convention). The Liability Convention entered into force 1 September 1972.

the Convention on Registration of Objects Launched into Outer Space,¹⁰ launching States shall establish a registry to note the launching of objects into space and shall inform the Secretary General of the United Nations of the establishment of such a registry. Each State party to the Treaty determines the contents of the registry. Article IV asserts that each State of registry shall provide the Secretary-General with certain information concerning each launched space object noted in that State's registry. Particularly important to the general question of liability is the clause in Article IV concerning information provided by the launching State on the appropriate designator or registration number of the space object.¹¹

The idea of registration does provide further incentive for launching States to remove space objects that can cause damage traceable back to the State of origin. However, although many space objects and their component parts and orbital debris can be tracked in space, it is not possible to track all pieces of debris that are also very capable of causing significant damage.¹² Furthermore, because of the untrackable and unidentifiable nature of most orbital debris, it is not known to whom all orbital debris belongs.

With respect to registration, if Articles II and III of the Liability Convention are read in conjunction with Article VII of the Outer Space Treaty, does the liability concept, with its resultant proof problems,

¹⁰ Convention on the Registration of Objects Launched into Outer Space, opened for signature 14 January 1975, 1023 UNTS 15 (hereinafter the Registration Convention). The Registration Convention entered into force 15 September 1976.

¹¹ *Id.* at art. IV, para. (b). Although chances are remote that the information provided by the launching State could be used to identify that a specific space object has in fact caused damage to another space object, the Earth or aircraft, if it were possible, albeit remotely at best, liability could be established against States responsible for the launching of the damage causing space object.

It has been argued that a failure of a State of registration to remove a hazardous space object in a timely manner or a failure of that State to allow another State to perform such a capture and removal operation should result in a finding of absolute liability of that State for damages. See H. Baker, ORBITAL DEBRIS: LEGAL AND POLICY IMPLICATIONS 71 (Nijhoff 1989). Determination of liability, provided the launching State responsible for that object is identifiable, could also be based on a theory of *res ipsa loquitur*. According to Black's Law Dictionary, Sixth Edition, *res ipsa loquitur* is defined as "the thing speaks for itself." It is a "[r]ebutable presumption or inference that defendant was negligent, which arises upon proof that the instrumentality causing injury was in defendant's exclusive control, and that the accident was one which ordinarily does not happen in the absence of negligence." In the case of damage in space, the probability of actually witnessing the damage causing event is low. Hence, application of the *res ipsa loquitur* doctrine of liability to a set of facts where damage has occurred, would establish a rebuttable presumption of negligence to the State of registration thereby putting the burden of proof on that State to prove that it was, in fact, not its space object that caused the disputed damage. The caveat here, of course, is that the responsible launching State can be identified. See H. BAKER, ORBITAL DEBRIS: LEGAL AND POLICY IMPLICATIONS 71 (Nijhoff 1989). However to apply the *res ipsa loquitur* negligence theory, a duty of care must exist and the defendant must have exclusive control over the instrumentality, in this case, the space object. See *id.* Moreover, for all intents and purposes, this theory allows only for a reward of compensation to injured plaintiffs for damages suffered but, by no means does the theory provide practical solutions for the capture and removal of orbital debris. *Id.*

¹² See figure 2 and refer to text accompanying footnote 1.

provide enough incentive to launching States to cleanup non-functional, damaged or destroyed space objects rather than incur costs resulting from subsequent damage to other functional space objects, the Earth or aircraft? Although not yet economically viable, capture and removal of nonfunctional, damaged or destroyed space objects could save a launching State the costs associated with liability if, of course, the responsible launching State is identifiable. In comparison with removal to higher (disposal or graveyard) orbits, in the case of nonfunctional satellites, capture and removal would at least assure the launching State that the retrieved object no longer poses a threat to other space objects, aircraft or the Earth.

B. Return of Space Objects of Another State

Article 5 of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space¹³ states that Contracting Parties that receive information about or discover a space object or its component parts in that State's jurisdiction, shall notify the launching authority and the Secretary-General of the United Nations. The launching authority may request that the State in which the space object or component part is discovered, take all necessary steps to recover that object or component part. The launching State bears the responsibility for reimbursing all monetary obligations incurred in the recovery and return of the space object or component part. For purposes of ownership therefore, as in maritime salvage law by analogy, launching States, as owners in fact, do not lose proprietary rights in any launched space object or component part even if those objects happen to fall in the territory of another State.

Paragraph 4 of Article 5 discusses the duty of a launching State to take effective steps to remove hazardous or deleterious space objects discovered in the territory or jurisdiction of another State. If that launching State is unwilling or unable to perform such an operation, the question arises as to whether that launching State loses certain possessory rights in the space object or component part. Can it be destroyed by the discovering State without the consent of the launching State to avoid possible grave consequences emanating from the satellite?¹⁴

C. Article VIII of the Outer Space Treaty: Jurisdiction, Control and Ownership of Space Objects, Component Parts and Orbital Debris

By their very nature, salvage operations of abandoned and derelict craft at sea require that present possessory interests in that property have been abandoned. In terms of space law, is it possible to declare a space

¹³ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, opened for signature 22 April 1968, 672 UNTS 119 (hereinafter the Rescue Agreement). The Rescue Agreement entered into force 3 December 1968.

¹⁴ I.H. Ph. Diederiks-Verschoor, *The Increasing Problems of Orbital Debris and their Legal Solutions*, 32 PROC. COLLOQ. L. OUTER SPACE 77, at 79 (1990).

object or component part abandoned and derelict and, therefore, subject to capture and removal by another interested third party? To discuss this possibility, the interrelated concepts of jurisdiction, control and ownership of space objects and their component parts as laid out by Article VIII of the Outer Space Treaty must be discussed. Article VIII states:

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 objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to Earth. Such objects or component parts found beyond the limits of the State Party to the Treaty on whose registry they are carried shall be returned to that State Party, which shall, upon request, furnish identifying data prior to their return.

The core issue of this Article is whether jurisdiction, control and ownership over space objects are permanent. Legal opinion favors permanency.¹⁵ In terms of salvage of space objects, at present, removal of objects may not be performed without the consent of the State of registration based on the absolute nature of jurisdiction, control and ownership.¹⁶ Some commentators argue that the absolute nature of jurisdiction, control and ownership can be circumvented in certain cases. Space refuse may be one of those cases if it is possible that "persons or property of innocent third-party States may be injured, lost or damaged."¹⁷ Moreover, removal could occur without consent if the hazard presented by the space object, component part or orbital debris threatens the safety of spaceflight¹⁸ or a satellite in the process of falling to Earth poses a threat of serious harm to the Earth.¹⁹ Such unilateral action could

¹⁵ BAKER, *supra* note 11, at 69. The author goes on to discuss the permanency of jurisdiction, control and ownership of "space refuse". In this context, permanency would impede attempts to minimize the quantity of space refuse. Certainly, some owners may consider some of their space objects that remain in space beyond their useful lifetimes to be space refuse. *Id.* However, when is an object to be considered space refuse even though, in terms of viability, it is still functioning? What is needed, of course, is a functional definition of orbital debris, space refuse and an agreed upon description or guideline of when space objects become orbital debris.

¹⁶ See generally BAKER, *supra* note 11, at 69-71.

¹⁷ *Id.*, citing C. Fishman, *Space Salvage: A Proposed Treaty Amendment to the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space*, 26 VIRGINIA J. INT'L L. 965 (1986).

¹⁸ *Id.*, citing H. DeSaussure, *The Application of Maritime Salvage to the Law of Outer Space*, 28 PROC. COLLOQ. L. OUTER SPACE 127 (1985).

¹⁹ See generally H. DeSaussure, *An International Right to Reorbit Earth Threatening Satellites*, 3 ANN. AIR & SPACE L. 383, at 391-92 (1978).

also be construed, however, as an act of piracy.²⁰ To perform any type of space salvage operation with the intent of cleaning up the space environment, one must ask under what circumstances, if any, a State may either lose jurisdiction and control of a space object or cede any existing rights to that space object.

D. *Article IX of the Outer Space Treaty*

In the context of environmental protection of space, Article IX of the Outer Space Treaty provides the basic rules that States Parties to the Treaty must respect when undertaking space activities. It states:

In the exploration and use of outer space, including the Moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of co-operation and mutual assistance and shall conduct all their activities in outer space, including the Moon and other celestial bodies *with due regard to the corresponding interests of all other States Parties to the Treaty* (emphasis added).²¹

Within this context, the issue of removal of spacecraft and other orbital debris can be considered. Because States Parties to the Outer Space Treaty have a general duty to conduct space activities with "due regard to the corresponding interests of all other States Parties to the Treaty," are launching States bound to capture and remove space objects that hinder the

²⁰ BAKER, *supra* note 11, at 70.

²¹ Outer Space Treaty, *supra* note 3, art. IX. The remaining portion of article IX states:

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. If a State Party to the Treaty has reason to believe that an activity or experiment planned by it or its nationals in outer space, including the Moon and other celestial bodies, would cause potentially harmful interference with the activities of other States Parties in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, it shall undertake appropriate international consultations before proceeding with any such activity or experiment. A State Party to the Treaty which has reason to believe that an activity or experiment planned by another State Party in outer space, including the Moon or other celestial bodies, would cause potentially harmful interference with activities in the peaceful exploration and use of outer space, including the Moon and other celestial bodies, may request consultation concerning the activity or experiment. *Id.*

right of access of other States to space orbits?²² Effectively, the answer to this question is no because there is no positive duty placed on launching States to remove inactive objects from orbit.²³ Hence, a dichotomy emerges whereby a launching State must, on the one hand, acquiesce to the corresponding interests of all other States party to the Treaty while, at the same time, it has no obligation to remove nonfunctional space objects that may impede access to space by other States. Obviously, it is as if the interest that has priority is that of the "first come, first served," *i.e.*, that of the launching State able to place its space object in orbit before any other State takes that position.²⁴ However, because of the work of the World Administrative Radio Conference in the implementation of an *a priori* planning regime for nominal orbital positions and bandwidths, the authenticity of this idea may no longer be valid.²⁵ In this respect, guidelines for other space activities, based on the work of the WARC in the field of worldwide telecommunications services, could be adopted by an international group of experts, brought together specifically to formulate and recommend standards, practices and guidelines that may serve as a basis for national activities in space. Such proposed standards, practices and guidelines could effectively regulate access to certain orbits such as low Earth orbits to guarantee that both current and future users will have continual and nondiscriminatory access. Taking this one step further, these guidelines, upon proper consideration, could discuss effective means of removal of spent satellites from certain orbits so that the limited resource of practical orbits for many space applications does not become clustered and unmanageable. For present and future users, the advantage of guidelines adopted by an international group of experts is that such guidelines may be constantly revised and updated to reflect rapidly changing situations. They may also consider scientific and technical advances in the mitigation and removal of space objects, component parts

²² Some commentators have made the argument that although the law of outer space does not require the removal of inactive satellites from orbit, the refusal to remove a derelict or non-functional craft from orbit could be the equivalent of misappropriation of outer space. That is prohibited by article II of the Outer Space Treaty. See P. Sterns and L. Tennen, *Orbital Sprawl, Space Debris and the Geostationary Ring*, 6 SPACE POL'Y 221, at 226 (1990).

²³ Any attempt to remove such satellites has been on a purely voluntary basis. *Id.*

²⁴ *Id.* at 224. Sterns and Tennen argue that a *de facto* order of priority has been put into place whereby the first state to occupy a specific orbit has the preemptive right to occupy the location of that orbit indefinitely. See *id.* However, it should be noted that a past World Administrative Radio Conference introduced an *a priori* planning regime for nominal orbital positions and necessary bandwidths. See generally C. Christol, *The Legal Status of the Geostationary Orbit in the Light of the 1985-88 Activities of the ITU*, 32 PROC. COLLOQ. L. OUTER SPACE 215 (1989). This plan does not require that a State be able to use the orbit/spectrum resource. This protects, therefore, the interests of developing countries in the use of the space resource of nominal orbital positions and bandwidths. See *id.* at 220. In essence because the ITU may make dispositions that allow for the exploitation and use of this resource, it has effectively clarified articles I and II of the Outer Space Treaty whereby no legal person, State, international organization or nongovernmental entity may assert sovereignty type proprietary claims over any area of space. See *id.*

²⁵ See generally Christol, *supra* note 24.

and orbital debris.

In principle, a general legal framework exists that adequately governs space and space activities. What is needed to augment this, however, is the establishment of an expert panel endowed with the power to adopt universal standards and practices for specific space activities. Persons drafting these regulatory standards and practices, free from the elaborate and time-consuming procedure necessary for treaty formulation and ratification, could draw ideas from other international legal sources in the preparation of these regulatory and administrative guidelines. One of these sources could be maritime salvage law.

III. Maritime Salvage Law

A. What is a Derelict?

In maritime salvage law the term "derelict" is applied to a thing "which is abandoned and deserted at sea by those who were in charge of it, without hope on their part of recovering it (*sine spe recuperandi*) and without intention of returning to it (*sine animo revertendi*)."²⁶ For it to be considered a derelict, a ship, craft or vessel must be abandoned. To meet the requirements for abandonment, four criteria must be fulfilled:

- 1) The abandonment must take place at sea, not on the coast;
- 2) *Sine spe revertendi aut recuperandi* (without hope of return or recovery);
- 3) It must be *bona fide* and for the purpose of saving life;
- 4) By order of the master in the face of danger from damage to the ship and the state of the elements.²⁷

In determining whether a vessel is derelict, one must look at the intentions and expectations of the master and crew at the time of abandonment.²⁸ A vessel is not abandoned if it is left temporarily by the master and the crew to obtain assistance if the master and the crew intend to return to the vessel.²⁹ Once abandoned with finality (no intention or expectation of return or recovery of the vessel), the vessel is in fact a derelict and may be salvaged by third parties.³⁰

B. Salvage of Derelict Vessels

In the case of a derelict vessel, anyone may take possession of it. The one *caveat* is that the first salvors or the first person or persons to

²⁶ Kennedy, LAW OF SALVAGE 85-86 (Stevens & Sons 1985).

²⁷ *Id.* at 198.

²⁸ *Id.*

²⁹ *Id.*

³⁰ See generally *id.* at 85-86.

take possession of the vessel, have the right of exclusive possession.³¹ That right may be enforced in court by injunction and/or an award of damages. While in possession of the salvaged property, salvors have some duties to the owners of the property. Among these is the duty not to be negligent with the property and the duty not to deliver the property to someone without a valid claim to it.³² Moreover, salvors do not acquire proprietary rights in the derelict. These proprietary rights remain with the original owner. Salvors may sue in court to collect a salvage award for the work performed in the salvage of the vessel.³³

C. The International Maritime Organization

The International Maritime Organization (IMO) has promoted the adoption of various conventions and protocols concerning maritime safety, the prevention of pollution and related matters. The IMO introduced the International Convention on Salvage of 28 April 1989.³⁴ This Convention has as its goal the drafting of uniform international rules regarding salvage operations. It discusses the duties of salvors, salvage of State-owned vessels, salvage awards and other relevant issues.³⁵ In terms of maritime salvage law, this will greatly increase the application of a uniform set of standards and practices to the salvage of derelict vessels or other vessels in distress in need of salvage assistance.³⁶

³¹ *Id.* at 518.

³² *See generally id.* at 415-17.

³³ It must be noted that certain States maintain policies that exempt state-owned vessels from the category of salvable vessels. Other States permit suits for a salvage award for recovery of public property. *See generally* 9 STUDIES IN AIR AND SPACE LAW 257-86 (K.-H. Böckstiegel, ed., C. Heymanns Verlag 1990), excerpts reprinted in C. CHRISTOL, SPACE LAW: PAST, PRESENT, AND FUTURE 249-261, at 255 (Kluwer 1991).

³⁴ IMO Doc. LEG/CONF.7/27 of 2 May 1989.

³⁵ *Id.* The International Convention of Salvage, at the time of this writing, has not entered into force. It has been ratified by eight countries: Egypt, Mexico, Nigeria, Oman, Saudi Arabia, Switzerland, United States and United Arab Emirates. According to article 29 of this Convention, it will "enter into force one year after the date on which 15 States have expressed their consent to be bound by it." *Id.* Based on the past practices of IMO with other Conventions, IMO could adopt codes, guidelines or recommended practices that would be meant to supplement or assist the implementation of the Salvage Convention. These recommendations could incorporate further requirements that could be necessary and useful or they could serve to clarify questions that arise concerning the salvage of sea craft. The advantage in maritime salvage law would be that these recommendations could be acted upon quickly by Governments rather than having to rely on the elaborate and time-consuming adoption procedures used for formal treaty instruments.

³⁶ It must also be noted that ICAO also has used this system of establishing technical standards and practices for aviation rather than formal treaty negotiation as a means of implementing guidelines in a quick manner that does not involve formal treaty procedures. This has been accomplished by adopting annexes to the Convention on International Civil Aviation.

IV. Application of Maritime Salvage Law Concepts to Space Objects, Component Parts and Orbital Debris

The question of what international law would apply to space salvage activities to ensure that they are performed lawfully without detriment to existing rights, the space environment or to existing or future space activities of other States, must be answered within a decision-making framework that is acceptable to all space-faring nations. Therefore, can relevant concepts taken from maritime law be adapted to space activities through international discussion and agreement on technical standards and procedures for space salvage operations geared toward the mitigation of space objects, component parts and orbital debris?³⁷

Initially, it must be stated that by law, the proprietary rights of owners of space objects, their component parts and orbital debris as well as those of the owners of sea craft, vessels and ships are permanent. In a salvage award action, the salvor may not claim proprietary interests in the ship. A salvage claim is based on a claim for services rendered in the salvage of the vessel. In this respect, ownership of a space object, its component parts and even orbital debris, according to treaty, is also continuous and permanent. Capture and removal by a third party, if ever allowable, would result in a claim by the salvor for services rendered against the owner of the space object.

An issue therefore, is whether space objects, component parts and orbital debris may ever be abandoned and declared "derelict" and hence subject to salvage by third parties. At present, existing space law prohibits other parties from interfering with space objects including nonfunctional or "derelict" space objects.³⁸ In the future, if space salvage is to become a reality, what constitutes a derelict space object should be defined as well as situations where space salvors will be allowed to perform salvage operations.

One commentator has defined a derelict space object as:

... one which is abandoned and deserted by those who were in charge of it, without hope on their part of recovering it and without intention of returning to it. Thus, manned spacecraft, abandoned by the crew without intention of returning to or recovering it, would be derelict. Unmanned satellites and other objects with a 'active lifespan' would be considered derelict when this active lifespan is terminated, that is, in a permanent inactive state ...³⁹

Other commentators have advocated a legal rule stating that launching States must remove nonfunctional intact objects from orbital locations. To enforce this rule, these space objects would be declared

³⁷ For a general comparison of maritime and space law, see generally, H. DeSaussure, *Maritime and Space Law, Comparisons and Contrasts (An Oceanic View of Space Transport)*, 9 J. SPACE L. 93 (1981).

³⁸ Article VIII, Outer Space Treaty. See generally, Sterns and Tennen, *supra* note 22, at 224-25.

³⁹ BAKER, *supra* note 11, at 70.

derelict. The ultimate purpose of this proposal would be to keep orbital slots open for the benefit of all potential space users as well as to minimize dangers of collision. Once labeled derelict, the space object would be subject to salvage by third parties without fear of violating the jurisdictional and control rights of the state of registry.⁴⁰ Even relocation of the space object to a disposal or graveyard orbit would also result in classification of that object as derelict. However, a longer period of reactivation or retrieval would be permitted.⁴¹ Still others have stated that rather than using the maritime analogy in the determination of derelict status, international space law should be expanded to include these issues through bilateral and multilateral agreements.⁴²

There is no consensus on the definition or classification of orbital debris. Because it is not always possible to identify to whom debris belongs, especially for purposes of liability, is it possible then to salvage debris items without technically violating the jurisdiction and control of the launching State? Presently, launching States retain jurisdiction and control over all space objects including debris even without the possibility of identification. Without the possibility of identification, however, in which State does jurisdiction and control vest? This issue has far-reaching ramifications especially if such unidentifiable orbital debris causes damage or destroys another space object.⁴³

The international community of nations, through the elaboration of a new space treaty or amendments to existing treaties, has the ability to arrive at consensus on an issue such as capture and removal of space objects, component parts and orbital debris. Certainly, it is an option to be considered. However, in light of the rapid and continuous changes that occur in the fields of space technology and science, it would perhaps be more beneficial to the community of nations to establish an international expert technical group to coordinate information and research and serve as a forum for advice and international consultation for all large scale programs likely to have long-term effects on the Earth and space environment. Such a group could create international standards and practices for various space activities in order to minimize the environmental impact of these activities. Because these technical solutions require continuous updating and revision as scientific knowledge and technology progress, one single international convention is not really the

⁴⁰ *Id.*

⁴¹ Sterns and Tennen, *supra* note 22, at 226-27.

⁴² Böckstiegel, *supra* note 33, at 255.

⁴³ Damage to or destruction of the space property of another State could result in a joint and several liability action to be filed against all other launching States because of the fact that the debris would be unidentifiable and more than likely, untraceable to any State of origin. This is especially true for those launching States that have jurisdiction and control of only one space object. Assuming that the space object is the only piece of hardware in space owned and operated by that State, then, in the event of damage or destruction, it could be argued that another space object, component part or orbital debris from another space object in fact caused the injury. For a developing launching State without the financial means to effectively prove that someone else has caused the injury, the burden would be, therefore, placed on other launching States. For developing countries, this could save enormous amounts of time, energy and money if faced with just such a situation.

proper forum in which to continually discuss ever-changing technological solutions. Rather than relying on time-consuming international lawmaking, this group could set standards on a continual basis and react to situations that merit immediate attention rather than attempting to garner international consensus over a period of years. Upon release of these standards, States could opt out of them by filing notification with the group within 60 to 90 days as with IMO, for example. Moreover, the group could adopt recommended practices that, although not binding, would provide information on practices that should be followed to minimize the environmental impact of space activities.

In terms of salvage of space objects, their component parts and orbital debris, the group could consider the advantages and disadvantages of space salvage, taking into account rules and regulations and other technical factors governing maritime salvage operations. The group could adopt technical standards or establish recommended practices to govern, in a practical sense, space salvage operations. Reference to maritime definitions of derelict vessels could also be made to determine whether the same conceptual model could apply to space objects, component parts and orbital debris. Reference can also be made to existing orbital debris mitigation efforts such as those adopted by NASA and ESA.⁴⁴ Recommended practices, based on maritime law and adapted to space activities, could be adopted. This group could also produce technical standards and practices that cover the practical aspects of defining when a space object becomes derelict. Above all, and especially in this situation, regulatory standards and practices are far more flexible and adaptable to present situations than purely legal rules.

V. Conclusion

Space objects, their component parts and orbital debris are objects that will continue to exist in space and plague safe space navigation. Mitigation and removal of such objects require proper planning and international consensus on a manner in which to carry out any cleanup efforts. In the event that the concept of "astrosalvage" emerges as a possibility, international arrangements would have to be discussed and considered to develop standards and practices that are fair and equitable to all States (and even private parties) interested in utilizing the resource of outer space. It is within this framework that the international community of nations might wish to come to agreement on the creation of

⁴⁴ Reference can also be made to the launch approval process in Japan as a source of information on mitigation and prevention of space debris even though as of yet, no fixed national policy or specific legal regulations exist.

At present, it should be noted that in terms of capture and removal of space objects, the United States has used the Space Shuttle as a tool in the retrieval of space satellites but in terms of cost, such activities are as of yet, not economically viable even though available. Office of Technology Assessment, *supra* note 5, at 25. ESA has captured and removed the Eureka spacecraft from orbit with the help of NASA's Space Shuttle Endeavor. The Eureka spacecraft was designed for multiple flights and ESA in fact paid NASA \$29 million for its launch and retrieval. Whether or not the spacecraft will be re-launched remains to be determined by ESA. See Harwood, *ESA Prepares Eureka for Retrieval by Endeavor Crew*, SPACE NEWS, May 24-30, 1993, at 9.

an international expert group of scientists and technicians who may review, assess and establish standards and can better provide guidelines for space activities which may have adverse environmental impacts rather than seek elaborate and time-consuming legal regulations (which take time to formulate and by their nature are static and often difficult to revise). All space-faring nations have given priority to the implementation of mitigation and removal procedures for orbital debris created during space activities. This is only the beginning but it is a positive step in the direction of maintaining space for future generations and future space activities.

THE INTERNATIONAL TELECOMMUNICATION UNION AND DEVELOPMENT

Francis Lyall*

Introduction

It is a matter of sadness to be contributing to an issue of a Journal honoring the memory of Judge Manfred Lachs. Having known his writings, it was both a pleasure and a stimulus to make his acquaintance at the annual gatherings of the International Institute of Space Law, and to see in person the sheer humanity that he embodied.

Thirty years ago, on 22 November 1963, introducing the final draft of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space to the Committee on the Peaceful Uses of Outer Space for its approval, Judge Lachs made it clear that the Principles were not a 'closed chapter' but part of a development. He went on:

[Lawmaking] is a long and painstaking process. It is a continuous process in which the lawmakers must remain watchful, facing the existing and changing requirements of life. We have to welcome what has been achieved and strive for further agreements. The law of outer space is in its formative stage only. We must proceed with prudence and care - take the full benefit of agreements reached, work on them, extend them, make them a living reality and continue with our efforts for further agreements.¹

Speaking in another place of the 1963 Principles, he underlined that:

The paramount consideration by which States should be guided in this law-making process for tomorrow, is "the benefit and interests of all mankind". This is repeatedly emphasized in all relevant instruments and stressed by writers on the subject. It is amplified by the desideratum that the exploration and use of space serve 'the betterment of mankind'.²

* Professor of Public Law and Dean of the Faculty of Law, University of Aberdeen, Scotland, U.K. Director, International Institute of Space Law (IISL).

¹ Additional Report of the Committee on the Peaceful Uses of Outer Space, A/5549/Add.1, Verbatim record of the Twenty-fourth Meeting. Annex, p. 4.

² M. Lachs, *The International Law of Outer Space*, 113 RECUEIL DES COURS D'ACADEMIE DE DROIT INTERNATIONAL [R.C.A.D.I.] 1-115, at 100 (No. 3, 1964). The reference to 'betterment' is from the Preamble of the Declaration. The 'benefit and interests' comes in para 1.

Within three years, the Principles of 1963 had been developed into the Outer Space Treaty, 1967.³ The 'betterment of mankind' and the 'benefit and interests of all mankind' had transmuted into the phraseology of Art. I, that '[t]he exploration and use of outer space ... shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind.' Exactly what this means is, of course, uncertain, and the dissatisfaction of some non-spacefaring states with the implementation of Art. I has led to it being put on the COPUOS agenda.

In this article, I wish to outline how within both the law and practice of the ITU, there has been and will be benefit accruing to the developing world from space, in partial satisfaction at least of the 'benefit' language of Art. I of the Outer Space Treaty. The new Telecommunications Development Sector is major evidence. However, I will also warn lest the ITU itself be damaged by the emphasis now laid on such matters becoming undue. I hope Judge Lachs would have approved.

History

As its name implies, the International Telecommunication Union has been devoted to the technical facilitation of international telecommunication. Its germ was the bi- and tri-lateral accords of the 1840s in Europe respecting the telegraph.⁴ In 1865 a more general agreement was arrived at,⁵ and in 1868 in Vienna what is recognizably the Union was established with an official International Bureau to service its administration.⁶ In due course the Telephone was added to its competence.⁷ Later, and mainly because of the hostility of the cable operators to a potential competitor, a separate institution, the International Radio-Telegraphic Union, was created to deal with the needs

³ 18 UST 2410, TIAS 6347; 610 UNTS 205; (1968) UKTS 10, Cmnd. 3519; (1968) 6 I.L.M. 386; (1967) 61 A.J.I.L. 644.

⁴ I have laid out the history of the ITU more fully in my *LAW AND SPACE TELECOMMUNICATIONS* 313-25 (1989). See also GEORGE A. CODDING JR., *THE INTERNATIONAL TELECOMMUNICATION UNION: AN EXPERIMENT IN INTERNATIONAL COOPERATION* (1972); GEORGE A. CODDING & A.M. RUTKOWSKI, *THE INTERNATIONAL TELECOMMUNICATION UNION IN A CHANGING WORLD* (1982); D.M. LEIVE, *INTERNATIONAL TELECOMMUNICATIONS AND INTERNATIONAL LAW: THE REGULATION OF THE RADIO SPECTRUM* (1970).

⁵ International Telegraph Convention, Paris, 17 May 1865, 130 CTS 198.

⁶ International Telegraph Convention, Vienna 21 July 1868; 1366 CTS 292.

⁷ Regulations in Execution of the International Telegraph Convention of 22 July 1875, Berlin, 17 September 1885; 165 CTS 212.

of radio when that came upon the scene.⁸ Curiously but sensibly, the new Union used the Telegraph Union's International Bureau for its administrative requirements, but it was not until 1932 that the logical step was taken and the 'wire' and 'wireless' Unions united to form the International Telecommunication Union, the ITU.⁹

The ITU, renewed, became a specialized agency of the United Nations in 1947.¹⁰ The structure then agreed persisted more or less intact for forty-five years although over the period the relative balance between the organs of the Union was subject to considerable change. Plenipotentiary conferences of the ITU were held at Buenos Aires in 1952,¹¹ Geneva in 1959,¹² Montreux in 1965,¹³ Malaga-Torremolinos in 1973,¹⁴ and Nairobi in 1982.¹⁵

By the time the Nairobi arrangements were due to be considered by the Nice Plenipotentiary of 1989 it was recognized that the ITU needed significant revision to cope with modern requirements. The globalisation of telecommunications, the increasing pace of technological change, the development of the information economy and its interactions around the world, had rendered the slow mechanisms of the ITU obsolescent, if not obsolete. The Nice Conference itself took some steps to meet known problems and difficulties.¹⁶ However, it recognized that these were only palliative, and more radical surgery was necessary. To that end it

⁸ Radio-telegraphic Convention, Final Protocol and Regulations, signed at Berlin 3 November 1906; 203 CTS 101; 1906 (UK) Parl. Papers HC 368.

⁹ Telecommunication Convention, General Radio Regulations, Additional Radio Regulations, Additional Protocol (European), Telegraph Regulations and Telephone Regulations, Madrid, 9 December 1932; 151 LNTS. 4; 6 MANLEY O. HUDSON INTERNATIONAL LEGISLATION 109 (1932-34).

¹⁰ International Convention on Telecommunications, Atlantic City, 2 October 1947; 63 Stat. 1399, TIAS 1901.1950 UKTS. No. 76, Cmd. 8124.

¹¹ International Telecommunication Convention, Buenos Aires, 22 December 1952; (1952) UKTS No. 36, Cmd. 520.

¹² International Telecommunication Convention, Geneva, 21 December 1959; (1958) UKTS No. 74, Cmd. 1484.

¹³ International Telecommunication Convention, Montreux, 12 November 1965; (1967) UKTS No. 41, Cmd. 3383.

¹⁴ International Telecommunication Convention, Malaga-Torremolinos, 25 October 1973; 28 UST 2495, TIAS 8572; 1209 UNTS 32; (1975) UKTS No. 104, Cmd. 6219.

¹⁵ International Telecommunication Convention, with Final Protocol, Additional Protocols I to VII and Optional Additional Protocol, Nairobi, 6 November 1982; 1985 UKTS No. 33, Cmd. 9557 (not yet published in the UST or TIAS Series).

¹⁶ ITU, Final Acts of the Plenipotentiary Conference, Nice, 1989 (Geneva 1990).

established a High Level Committee to review the structure and functioning of the Union, which reported to the Administrative Council of the ITU in April 1991.¹⁷ The Committee's recommendations were therefore available before more than a handful of countries had ratified the Nice documents. Notwithstanding, the ITU Administrative Council decided to press ahead, and an Additional Plenipotentiary Conference was held in Geneva in December 1992 at which the ITU constitutional documents were revised in the light of the High Level Committee's counsel.^{18,19}

The Geneva Conference, 1992, will doubtless come to be seen as a watershed in the history of the ITU. For this article its most important action was the creation of a Telecommunications Development Sector as part of a reordering of the main executive organs of the Union into three sectors whose function is epitomized in their titles. The other two are the Standardization Sector and the Radio-Communication Sector.²⁰ Each Sector will be appropriately staffed, and be headed by a Director elected by the plenipotentiary conference of the Union. But this is not the place fully to discuss the Geneva changes, or even further to detail them.²¹

The Development of Development

When one thinks of 'Development' within the context of the UN family of agencies, the United Nations Development Programme (UNDP)

¹⁷ ITU, *Tomorrow's ITU: The Challenges of Change: the Report of the High Level Committee to review the structure and functioning of the International Telecommunication Union* (Geneva 1991).

¹⁸ ITU, *Final Acts of the Additional Plenipotentiary Conference, Geneva, 1992* (Geneva 1993). The ITU documentation has been split between the Constitution, containing principles unlikely to be modified, and the Constitution dealing with the detailed working of the Union, but which is likely to be modified by later plenipotentiary conferences. I refer to these below as CS (Constitution) and CV (Convention).

¹⁹ In the light of the decision of the Administrative Council to hold the Geneva Conference, no other countries ratified the Nice documents. The Nice revisions of the ITU constitution will therefore never have legal effect, important though they undoubtedly were in the production of the Geneva Constitution and Convention of 1992.

²⁰ The International Frequency Registration Board is reduced in function and reconstituted as a nine member part-time Radio Regulations Board within the Radio-Communications Sector.

²¹ See F. Lyall, *The International Telecommunication Union Reconstructed*, IISL paper No. 1-93-804, a revised version of which will appear in 36 PROC. COLLOQ. L. OUTER SPACE (in print, 1994). See also the ITU section of F. LYALL, *SPACE LAW* (forthcoming, 1995?).

comes immediately to mind. By Resolutions 27 and 30 of the Montreux Plenipotentiary Conference of the ITU, the Union decided fully to participate in the UNDP. This has continued.²²

More directly, however, over the years the ITU itself devised its own assistance programs, for example partly through the International Frequency Registration Board whose training courses for the staff of new administrators in the developing countries must be praised. But the clearest manifestation in law of first, the introduction, and then the evolution of 'development' as a significant part of ITU responsibilities can be easiest highlighted by comparing the Preamble and the 'Purposes' article of successive manifestations of the ITU Convention. These mirror practice.

Neither the Preamble, nor art. 3 (Purposes) of the Atlantic City Convention of 1947²³ or the Buenos Aires Convention of 1952²⁴ mention development. The change comes with the Geneva Convention of 1959.²⁵ Such matters do not there appear in the Preamble nor in the generality of the Purposes of art. 4.1. However, in the specification of the particular actions the Union is to take to attain the general aims, art. 4.2.(d) calls on it to: 'foster the creation, development and improvement of telecommunication equipment and networks in new or developing countries by every means at its disposal' including taking part in UN programs. This language is retained at the same points in the Montreux Convention of 1965,²⁶ and that of Malaga-Torremolinos of 1973.²⁷ Under the aegis of this provision the ITU played an important but facilitating role, putting developing countries in touch with providers of telecommunications aid and expertise in the developed countries.

A further change comes in the Preamble of the Nairobi Convention, 1982.²⁸ '[H]aving regard to the growing importance of telecommunication for the preservation of peace and the social and economic development of all countries', is inserted as an express motivation of the parties, and, presumably to underscore the point, 'economic and social development' is repeated as a motive three clauses later. Further, in the Purposes article, art. 4.1(a) is added to. Not only is the Union to maintain and extend international cooperation; on an equal basis to that purpose it is 'to promote and to offer technical assistance to developing countries in the

22 Cf. Resolution No. COM6/15 of the Nice Conference, 1989.

23 *Supra* note 10.

24 *Supra* note 11.

25 *Supra* note 12.

26 *Supra* note 13.

27 *Supra* note 14.

28 *Supra* note 15.

field of telecommunications. And, while art. 4.2(c) still retains the language of the former art. 4.2(d), use of the Union's own resources is added as a way by which the Union may foster telecommunications in the developing countries. Nice, 1989,²⁹ and Geneva, 1992,³⁰ (where the Purposes Article is recited as art. 1 of the Constitution) retain this phraseology in both Preamble and Purposes.

Of course all this must be seen in the context of the time. I would not claim the ITU as unique. It was part of the growing North-South dialogue, and similar arguments were being heard elsewhere. The ITU was not alone in being seen as a forum through which development and technical assistance might be channeled. But in the case of telecommunications, the need for assistance was clear. The question was the best method of its delivery. Thereafter a number of documents are significant, including 'The Missing Link' (the Report of the Maitland Commission), 1985, and 'The Report of the Secretary General's Advisory Group on the Changing Telecommunications Environment', (the Report of the Hansen Committee)(February 1989). These contributed to an awareness within the Union, and, perhaps equally importantly, a willingness (even if sometimes reluctant) by the richer ITU members to contribute to such development actions by the Union.

Be that as it may, Geneva 1992 is a further step.³¹ The new Telecommunications Development Sector (TDS) is to deal with all telecommunications development matters within the purview of the Union. The concentrating of development matters in the new Sector is significant. It recognizes the importance of Development within the responsibilities of the Union, gathers much that was already under way under different wings of the Union, places that work on a much more coherent basis, and gives it significant standing within the Union.

Chapter IV of the Geneva Constitution, (CS arts. 21-24) deals with the broad principles of the TDS, arts. 16-18 of the Convention giving further specification to its activities. Headed by a Director elected by the Plenipotentiary Conference (CS arts. 8.2.g and 21.3) the TDS is to work through world and regional telecommunication development conferences, through study groups and is serviced by a bureau, the Telecommunication Bureau. Members of the TDS include as of right the administrations of all members of the Union, along with any entity or organization authorized by the appropriate procedures to be a member of the sector (CS art. 21.4).

Telecommunication development conferences are to be fora for discussion and consideration. They may be held on a world or regional

²⁹ *Supra* note 16.

³⁰ *Supra* note 18.

³¹ What is written is accurate in law, however, it should be noted that the policy decision was taken at the Nice Conference in 1989. See art. 11A of the Nice Constitution, *supra* note 16.

basis, in a cycle of one world conference per four year Union cycle, and within that period such regional conferences as may be desirable in terms of resources and priorities (CS art. 22.3). Conferences will not produce final acts, only resolutions, decisions, recommendations or reports. These must, of course, conform with the Constitution, Convention and administrative regulations. The foreseeable financial implications must be taken into account and conferences should not adopt resolutions and decisions which may cause expenditure in excess of limits set down by Plenipotentiary Conference (CS art. 22.4).

World conferences are to establish work programs and guide-lines for the Sector (CV art. 16.1.a). Regional conferences will deal with matters specific to the region concerned (CV art. 16.1.6). Telecommunication Development Conferences are to fix objectives and strategies for a balanced world-wide and regional development of telecommunications (CV art. 16.1.c). This paragraph goes on to indicate that the conferences should give 'particular consideration to the expansion and modernization of the networks and services of the developing countries as well as the mobilization of resources required for the purpose. They shall serve as a forum for the study of policy, organizational, operational, regulatory, technical and financial questions and related aspects, including the identification and implementation of new sources of funding' (CV art. 16.1.c). Channels of technical assistance and financial aid are therefore being opened up and existing channels deepened.

Space

The creation of space telecommunications services has been of immense benefit to many developing countries, some of whose national telecommunication networks depend on access to satellite systems. Here 'the benefit of all countries' is attained, even though use of the systems has to be paid for. Indeed in systems such as that of INTELSAT, the developing countries have a voice, as they share in the governance of the system, albeit through a 'shared governor'.³²

But one area developing countries' concern lies in principle of the freedom of use of outer space of Art. I of the Outer Space Treaty. They fear that freedom could be used by the space-competent states to establish a priority of use and exploitation. This they might exhaust a resource. Or, almost equally objectionably, the currently space-competent might establish themselves in space in ways most convenient both scientifically and economically, leaving the resources more difficult to exploit for those who might come later. Two aspects particularly encapsulate the problem: the 'first come first served' basis on which the ITU procedures for the international protection of radio frequencies operate, and the analogous position as to orbital positions. In connection with the latter, there is, of

³² See F. LYALL, LAW AND SPACE TELECOMMUNICATIONS, *supra* note 4, at 97-104.

course, the extraordinary claim contained in the Declaration of Bogota, 1976.³³ In this Brazil, Colombia, Congo, Ecuador, Indonesia, Kenya, Uganda and Zaire, (most, but not all, the states through which the equator runs), stated that, by virtue of their terrestrial position, they each had sovereign rights over that part of the geostationary orbit over each of their territories, but they made no claim to any part of 'space' lower or beyond that orbit. The claim festers on, and it is time that other states gave it its quietus.

Be that as it may, the problems of 'first come first served' whether of frequency or of orbit, remain. But they have been ameliorated. The ITU has never adopted a wholly firm position as to 'first come first served' for frequencies, for in the ultimate a state may assign any frequency it wishes to a station under its jurisdiction. International compliance with ITU procedures and the concepts of frequency allocation and the Master International Frequency Register depends as much on the laws of physics as upon the uncertain sanctions of International Law.

That said, the outcome of the World Administrative Radio Conference dealing with the Geostationary Orbit and the Services utilizing it, WARC-ORB 1985-88,³⁴ is the allotment to each state (whether or not a participant in the ITU system) of a nominal orbital position within a predetermined arc of the geostationary orbit, a band width of 800 MHz for up and down links, and a service area for national coverage and generalized parameters. These allotments may be used by others, but, when a state wishes to use its 'position' it has a right to take it over from any prior occupant. The position of the non-spacefaring countries is therefore secured for national services.

Problems

So far I have indicated ways in which the developing countries are directly or indirectly benefited through the ITU. Unfortunately the position is not wholly unclouded, and in a dark mood, one could foresee ways in which the ITU system could be damaged by ill-considered action by developing countries.

First, there is the matter of Tongasat.³⁵ In 1990 the Kingdom of Tonga filed notice with the IFRB of its intention to use a number of geostationary orbital slots additional to its allocation under the WARC-

³³ Printed in 2 *MANUAL ON SPACE LAW* 383-87 (N. Jasentulyana & R.S. Lee, eds., 1979-82).

³⁴ ITU, Final Acts Adopted by the Second Session of the World Administrative Radio Conference on the Use of the Geo-stationary-Satellite Orbit and the Planning of the Space Services Utilizing it (ORB-88) (Geneva 1988).

³⁵ M.L. Smith, *Legal and Policy Developments in International Satellite Communication*, 34 *PROQ COLLOQ. L. OUTER SPACE* 342-7, at 345 (1992).

ORB-88 provisions. *Ex facie*, under the ITU procedures notification gave it, as it were, a prior claim to these positions. The fact was that Tonga did not require those slots for its own national telecommunications purposes, but was willing to make financial gain through assigning their use to commercial entities, whose connection with Tonga was purely one of mutual profit. This matter is not yet finished, although Tonga has not persisted with all the notifications. US and other companies have seen it as a way to get access to space. In my view this is perhaps a bald (and bold) attempt to bypass the supervisory jurisdiction of the states with which these companies have a genuine link, and which are under a duty so to supervise under Art. VI of the Outer Space Treaty. Further, it is an attempt to use what was designed as a procedure to impose order upon the use of a natural resource in the interests of all,³⁶ into a 'claim' like that of a prospector of old, but one who leases his staked-out area to another and does not work it himself.³⁷ That is a perversion. Why should other more scrupulous countries give credence to such a claim by respecting it? And, if the system does operate to shelter such claims, why should such states continue to respect and comply with such a system?

The other area of the ITU and the developing countries that worries me is that of the financing of the Union and its decision-making processes.

The usual method by which members' contributions to UN agencies are assessed is on the basis of gross national product. By contrast ITU financing is voluntary on the part of its members, each member choosing a class of contribution from a scale of units.³⁸ This funding method which evolved last century, is under attack within the ITU by the developing countries. The general UN method is more favorable to them, affords no discretion to contributors, and is therefore difficult for the major countries to avoid without patently going into arrears of contribution. Yet there is much to recommend the 'contributory unit' concept in such as the UPU and the ITU, which are, after all, organizations with limited financial

³⁶ The geostationary orbit is a natural resource which it is in the interests of all rationally, efficiently and economically to use. Geneva CV, *supra* note 12, at art. 44.2.

³⁷ Properly staked claims used to have to be worked by their claimants if their validity was to be recognised in law. Some might argue it is proper for a state to lease the use of its WARC-ORB-88 allocation, thereby securing some financial 'benefit' from space albeit that seems not to have been in contemplation by the WARC. I am not so sure. In any event such a step is different from the Tongan action.

³⁸ The Universal Postal Union is the only other UN Specialised Agency financed in this way. In the UPU, under art. 125 of the General Regulations applicable since Hamburg 1984 (in force 1976) and carried on by the Washington Regulations of 1990, there are nine contribution classes ranging from 50 units down to 1/2 unit, the latter being available only to 'the least advanced countries' as listed by the United Nations. See below for the ITU equivalent scale, which has a wider range.

requirements for their major function, the encouragement and facilitation of cooperative international action.

The 1992 Geneva financial arrangements have retained those agreed at Nice in 1989.³⁹ Twenty-two classes of contribution range from a 40 unit class to a 1/16th (0.0625) unit class - a range in which the minimum is 1/640th of the largest.⁴⁰ This is not satisfactory. Although the largest contributors (the 40 unit contributors) do not individually contribute more than 7%, the fact is that the bulk of the ITU finance is provided by a small minority of its members. And the ITU works on the usual one-state-one-vote system. The 1/16 unit member has an equal vote with the 40 unit member, whose contribution is 640 times greater. A cluster of small contributors can wield a large voting power, without significant responsibility. The introduction of 'development' as an avowed aim of the ITU outlined above, has curiously mirrored the willingness of the Union progressively to lessen the size of the smaller contributory units. As a result voting power is becoming grotesquely divorced from its financial implications. Arrangements such as those of INTELSAT and INMARSAT, where in their important organs contribution is linked to voting power, should be examined. Even a modified recourse to such strategies might be wise. Some countries are starting to consider whether the ITU is as necessary an organization as it used to be. The Union was established and still has its major function as the forum within which technical affairs of telecommunication are negotiated and agreed. An ill-considered use of voting power by developing countries to give what the developed countries could consider an undue prominence to 'development' could damage, and, at worst, destroy a valuable and under-sung organization, whose general utility has been obvious for one and a third centuries.

39

Nice Convention, *supra* note 16, at art. 27.

40

Id. at art. 33.1.1.

JUDGE MANFRED LACHS AND THE PRINCIPLE OF *JUS COGENS*

Carl Q. Christol*

Introduction

Manfred Lachs, following the tradition of many liberal and far-seeing jurists, perceived that law is a living institution designed to serve the interests, values, wants, and needs of an increasingly interdependent and dynamic world community. His background and experience led him to inquire into the nature and utility of a peremptory norm of general international law (*jus cogens*). Following a thoughtful assessment of the emergence of the *jus cogens* norm, which he referred to variously as a "notion," "rule," "general rule," and "principle," he declared in 1984 that *jus cogens* "is an important new chapter of international law . . ."¹ He then added that *jus cogens* "may grow at a greater speed than envisaged at its cradle."²

* Professor Emeritus of International Law and Political Science, University of Southern California; Member: International Academy of Astronautics, International Institute of Space Law, American Institute of Aeronautics and Astronautics, International Law Association; Honorary Member, Japanese Society for the Study of Law and Policy on Space Utilization; Past President, Association of United States Members of the IISL; Past Chairman, Committee on Aerospace Law, American Bar Association.

¹ M. Lachs, *The Development and General Trends of International Law in Our Time*, 169 RECUEIL DES COURS D'ACADEMIE DE DROIT INTERNATIONAL [R.C.A.D.I.] 9, at 211 (No. 4, 1984). Chapter 12 entitled "Jus Cogens" consists of 10 pages at 201-211. The interest in the *jus cogens* principle has resulted in an extended bibliography. Important contributions have been made by J. SZTUCKI, *JUS COGENS AND THE VIENNA CONVENTION ON THE LAW OF TREATIES, A CRITICAL APPRAISAL* (1974); L. HANNIKAINEN, *PEREMPTORY NORMS (JUS COGENS) IN INTERNATIONAL LAW: HISTORICAL DEVELOPMENT, CRITERIA, PRESENT STATUS* (1988); E. Suy, *The Concept of Jus Cogens in Public International Law*, in 2 CARNEGIE ENDOWMENT FOR INTERNATIONAL PEACE, PAPERS AND PROCEEDINGS 17 (1967); R. Ago, *Droit des Traités à la Lumière de la Convention de Vienne*, 134 R.C.A.D.I. 320-327 (No. 3, 1972); C.L. ROZAKIS, *THE CONCEPT OF JUS COGENS IN THE LAW OF TREATIES* (1976); A. Gómez Robledo, *Le jus cogens: sa genèse, sa nature, ses fonctions*, 172 R.C.A.D.I. 9 (No. 3, 1982); L.A. Alexidze, *Legal Nature of Jus Cogens in Contemporary International Law*, 172 R.C.A.D.I. 213 (No. 3, 1981); G. Gaja, *Jus Cogens Beyond the Vienna Convention*, 172 R.C.A.D.I. 271 (No. 3, 1981); A. Verdross, *Forbidden Treaties in International Law*, 31 AM. J. INT'L L. 571 (1937); A. Verdross, *Jus Dispositivum and Jus Cogens in International Law*, 60 AM. J. INT'L L. 55 (1966); G. Schwarzenberger, *International Jus Cogens?* 43 TEXAS L. REV. 455 (1964); V.S. Rao, *Jus Cogens and the Vienna Convention on the Law of Treaties*, 14 INDIANA J. INT'L L. 366 (1974); G.O. Christenson, *The World Court and Jus Cogens*, 81 AM. J. INT'L L. 93 (1987).

² *Id.*

Scholars writing in French regularly refer to *jus cogens* as a "*règle impérative*" or as a "*norme impérative*." Article 53 of the May 22, 1969 Vienna Convention on the Law of Treaties³ bears the title "Treaties conflicting with a peremptory norm of general international law (*jus cogens*)."⁴ The article states:

"A treaty is void if, at the time of its conclusion, it conflicts with a peremptory norm of general international law. For the purposes of the present Convention, a peremptory norm of general international law is a norm accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted and which can be modified only by a subsequent norm of general international law having the same character."⁵

Judge Lachs and the Superior-Inferior Dichotomy

The proper identification of terminology allows for an understanding of the substantive meaning of the words adopted by the legal scholars who crafted Article 53. The term "norm" or its French equivalent "*règle*" is not to be identified with the English word "rule" which occupies in terms of importance or significance a somewhat lower rung on the legal totem pole than does the term "norm" or "principle." The fundamental significance of *jus cogens* elevates it to higher legal status than that of a rule. This is true even though rules are often characterized as being consequence oriented. Although Article 53 provides that a treaty which is in conflict with the *jus cogens* principle is "void," this does not detract from the fact that *jus cogens* is a peremptory legal norm.

Judge Lachs in adopting the superior-inferior dichotomy referred to the "lower floors of the law."⁶ By inference the upper floors will contain the superior norms.

Reasons for Superior Norms

In order to support a superior-inferior dichotomy, it is necessary to identify criteria whereby there may be a differentiation between that which must be deemed superior and that, which being subordinate to and inconsistent with the superior, must be void.

³ U.N.G.A. Doc.A/CONF.39/27 (23 May 1969); 63 AM. J. INT'L L. 874 (1969); 8 I.L.M. 679 (July 1969). The agreement entered into force on January 27, 1980. The United States voted for the convention. The President submitted it to the Senate for its advice and consent on November 22, 1971. The United States has not become a party to the agreement.

⁴ *Id.*

⁵ *Id.*

⁶ See M. Lachs, *supra* note 1, at 202.

According to Judge Lachs the basic and underlying considerations supporting the dichotomy find support in both moral and practical grounds. In his brief canvass of the subject, in referring to the views of scholars, going back to the time of Wolff and Vattel, he relied on the practical need for "public order," while also referring to the possibility of "immoral obligations."⁷ With his reference to public order Judge Lachs shared the outlooks of proponents of a positive law approach who linked *jus cogens* "with the notion of international public policy (or, order)."⁸

In his 1984 lectures, Judge Lachs indicated an awareness of the philosophical, practical, moral, social, and historical forces at work. The brevity of his analysis prevented a full exposition of the factors supporting the *jus cogens* principle. However, since he was a member between 1962 and 1966 of the International Law Commission (ILC), which drafted the proposed convention, he knew that underlying the concept of a peremptory norm was the philosophical assumption that the norms would serve the higher values and interests of States and of mankind at large. His philosophical commitment to the goal of fundamental justice and to the concomitant effective utilization of institutions provided support for his acceptance of the norm. He realized that the presence of the norm can contribute to the existence of a general juridical expectation that important goals can be identified, promulgated, and realized.

From a practical point of view the principle acknowledges the existence of a constitutive legal norm. This allows for the identification of superior norms, *e.g.*, those from which no derogation may take place. This can be supported because rationally, and in the very nature of things, there are higher or supreme considerations as opposed to lower or subordinate ones. The principle may also be based on a view that the realization of valued goals can be achieved only through processes which depend on the presence of both higher and lower ranges of responsibility and authority.

A practical illustration of such formal authority and process is reflected in the experience of the United States. According to Article 6, paragraph 2 of the United States Constitution it "shall be the supreme law of the land. . . ." The U.S. Supreme Court confirmed this principle in 1803 when it held that a national statute inconsistent with the Constitution would have to give way.⁹ *Jus cogens* possesses the merit of providing order and structure. With the general acceptance of this fundamental distinction practical institutions can engage in a decisional process.

Through the acceptance of lesser norms within a hierarchical structure some of the abrasiveness and counter-productivity, which would

⁷ *Id.* Earlier writers had frequently referred to "*bonnes moeurs*" and "*bonos mores*."

⁸ J. SZTUCKI, *JUS COGENS AND THE VIENNA CONVENTION ON THE LAW OF TREATIES: A CRITICAL APPRAISAL* 63 (1974). Compare M. Lachs, *The Law of Treaties - Some General Reflections on the Report of the International Law Commission*, in *RECUEIL D'ÉTUDES DU DROIT INTERNATIONAL EN HOMMAGE À PAUL GUGGENHEIM* 391 (1968).

⁹ *Marbury vs. Madison*, 5 U.S. (1 Cranch) 137, 2 L. E. 60.

exist when levels of authority and priorities are undifferentiated, can be eliminated. Through the identification of basic standards of international conduct the prospect for the rule of law, and all that flows from this concept, including the voiding of certain agreements and expectations, can be materially advanced. Through the acceptance of the primacy of fundamental principles there can be an orderly structuring of the international legal system.

Judge Lachs was explicit in finding support for the principle on moral grounds. With such a foundation there is a prospect that a sensible international public policy and good moral conduct can be realized. He made specific reference to the view advanced by A. Verdross¹⁰ that the norm would rely on the right reason of natural law and would serve the "higher interest of the whole international community."¹¹

The attention given to the *jus cogens* principle by the International Law Commission can be attributed, at least in part, to the revival of natural law thinking in the 1920s. O'Connell has concluded that this movement resulted in support for the existence of superior norms which could not be set aside by agreements.¹² The same view was advanced by Tunkin who considered that the writings of Grotius and Vattel supported the proposition that there are legal "principles from which States cannot deviate by an agreement."¹³

There is a close relationship between moral and social grounds for the norm. The high social interest of society, dependent on the existence of world community perspectives, can be served and advanced through the presence of peremptory norms of general international law. The *jus cogens* norm is supported by the view that the satisfaction of the higher interest of the entire community should prevail over opposing and contradictory national preferences, particularly where the latter deviate from *bonos mores* standards.

Although Judge Lachs did not mention specifically the support provided to the *jus cogens* norm by historical experience, it is evident that he was guided by historical considerations in seeking to understand the ultimate utility of the principle. He was much interested in the role and function of customary international law and community serving values

¹⁰ A. Verdross, *Forbidden Treaties in International Law*, 31 AM. J. INT'L L. 572 (1937).

¹¹ See M. Lachs, *supra* note 1, at 337, n. 762. See also his reliance on Ch. De Visscher regarding the "moral" and "theoretical" aspects of the role of *jus cogens*, *id.* at 211.

¹² D.P. O'CONNELL, 1 INTERNATIONAL LAW 244-345 (1970).

¹³ G.I. Tunkin, *Jus Cogens in Contemporary International Law*, 3 TOL. L. REV. 107 (No. 1, 1971). For an analysis of the role of legal and philosophical writings between the Treaty of Westphalia in 1648 and the Congress of Vienna (1814-1815) on the *jus cogens* principle, see L. Hannikainen, *supra* note 1, at 30-37.

lodged in the received practices of the past.¹⁴ He urged that among the criteria to be consulted in determining the existence of a peremptory norm was "the object and purpose of the rule in question."¹⁵

In sum, Judge Lachs, founding his conclusions upon the existence of suitable criteria, was supportive of the broad proposition encompassed in the expression *jus cogens*. He certainly would have agreed that the combined philosophical, practical, moral, social, and historical considerations that have been mentioned have allowed the *jus cogens* principle to "become firmly rooted in the legal conviction of the community of States."¹⁶

Judge Lachs drew special attention to "an important element"¹⁷ appearing in the definition of the *jus cogens* principle¹⁸ namely that it must be accepted and recognized by the international community "as a whole."¹⁹ He explained that the words "as a whole" indicated that "acceptance is not required by each and every member of the international community."²⁰ Supporting this outlook was his view, which certainly is the preponderant view on the subject, that "even the basic principles of international law are not required to be expressly accepted by every State."²¹

The International Law Commission and *Jus Cogens*

Hersch Lauterpacht as special rapporteur on the law of treaties in 1953 suggested that "a treaty, or any of its provisions, is void if its performance involves an act which is illegal under international law and if it is declared so to be by the International Court of Justice."²² This basic proposition, following much revision while still retaining its initial thrust, became Article 53 of the ILC's 1966 final draft. In 1958 the special rapporteur was Gerald Fitzmaurice. He urged that "it is only if the treaty involves a departure from or conflict with absolute and imperative rules or prohibitions of international law in the nature of *jus cogens* that a cause of invalidity can arise."²³ From 1961 the special rapporteur was Sir

¹⁴ *Supra* note 1, at pp. 175-178 and 253-261. These are Chapter 11 entitled "International Rights and Obligations: Pacta Sunt Servanda and Good Faith," and Chapter 15 entitled "The Effectiveness of International Law."

¹⁵ *See* M. Lachs, *supra* note 1, at 207.

¹⁶ E. Schwalb, *Some Aspects of International Jus Cogens as Formulated by the International Law Commission*, 61 AM J. INT'L LAW 951 (1967).

¹⁷ *See* M. Lachs, *supra* note 1, at 210.

¹⁸ Lachs used the word "rule".

¹⁹ *See* M. Lachs, *supra* note 1, at 10. Italics in original.

²⁰ *Id.*

²¹ *Id.*

²² 2 Y.B. Int'l. L. Comm'n 154 (1953).

²³ 2 Y.B. Int'l. L. Comm'n 27 (1953).

Humphrey Waldock. In his 1966 report on behalf of the Commission he observed that "a *jus cogens* rule is one which cannot be derogated from but may only be modified by the creation of another general rule which is also of a *jus cogens* character."²⁴

Judge Lachs, as a member of the ILC between 1962 and 1966, was fully engaged in the discussion with Commission members leading to the proposed agreement. Also serving on the Commission during this critical time were T.O. Elias, E. Jiménez de Aréchaga, S. Rosenne, G.I. Tunkin, and A. Verdross as well as others. All were aware that the *jus cogens* principle appeared "to meet with a large measure of approval . . . [and that only one government] really questions the existence today of a concept of rules of *jus cogens* in international law."²⁵

During the same period Roberto Ago served on the Commission and later served as the president of the Vienna Conference on the Law of Treaties. In both situations he played important roles in gaining treaty status for the *jus cogens* principle.

Because of the authority of a preemptive norm and the values and interests enshrined in it, it has been necessary to establish the criteria deemed relevant to the identification of *jus cogens*. The criteria, like the norm itself, must be identified, must command general respect, and must be believed in. If this is not the case the criteria will be suspect and the principle will not work.

After there has been an identification of criteria, there remains the challenge of reaching agreement on whether a specific illustration, *e.g.*, a candidate for *jus cogens* status, meets the required criteria. At the present stage of modern international law, with its demonstrated capacity for dynamic growth, those who have addressed themselves to the principle, have, it seems, been impelled to identify their favored concepts. The resulting debate has become, in effect, an unscientific rating process in which favored candidates for *jus cogens* status are being examined in a particularistic, unorganized, and disparate series of academic and official discourses.

Two basic tests can be used to fix the criteria. The first, founded in philosophical considerations, would emphasize what Roberto Ago referred to as the "conscience universelle" of humankind.²⁶ The second, so close to the heart of American jurisprudence, as well as the product of general history, are the practical considerations which have stood the test of time.²⁷

Thus, to achieve *jus cogens* status the substantive principle would have to reflect positively significant morally based social values. It would have to be consistent with the development of a maturing, meaningful, and

²⁴ 2 Y.B. Int'l. L. Comm'n 24 (1966).

²⁵ *Id.* at 23.

²⁶ See M. Lachs, *supra* note 1, at 324, n. 32.

²⁷ See for example B.N. CARDOZO, THE NATURE OF THE JUDICIAL PROCESS 9-16 (1921); O.W. HOLMES, THE COMMON LAW (1881).

structured world legal system. It would have to command the loyalty of juridical and natural persons who would commit themselves to the principle and be guided by it. The principle would have to contribute to the efficient operation of an acceptable degree of world order including the interdiction of arbitrary behavior on the part of international legal persons. Encompassed in these criteria would be the expectation that there would be a reduction and alleviation of tensions produced by arbitrary activities. A similar, but more limited, assessment has been made respecting *jus cogens* criteria, namely, a moral basis, the importance of the suggested principle to international peace and order, whether the norm is accepted in the world community, and whether the norm will be beneficial to global interests, *i.e.*, "the common good of the international community."²⁸ The validity of these criteria is beyond dispute.

Viewed from another perspective one might ask whether the non-inclusion of the substantive principle in the realm of *jus cogens* would constitute a violation of *bonos mores*? In the same vein, would the non-inclusion interrupt or severely prejudice historical practices constantly relied upon by the members of the world community? In this connection it has become evident that the customary rules of general international law have influenced the substantive content of the *jus cogens* principle. Suitable responses to these criteria will allow the principle of *jus cogens*, as a dynamic concept, to benefit those who exist within the domain of States, and of States, *per se* -- both old and new. With the acceptance of criteria for the identification of *jus cogens* a new level of stability can be brought to the constantly changing and practical needs confronting members of the world community.

Appropriate responses would also give encouragement to the hope that the international system can promote the goal of peaceful change. Although Judge Lachs did not frame his assessment of *jus cogens* specifically in the manner just outlined, the present author feels confident that the foregoing fits into Judge Lachs' assessment of the issues.²⁹

The Commission and the Substantive Content of Jus Cogens

The Commission was faced with two problems respecting the substantive content of *jus cogens*. First, it had to determine whether to offer a broad delineation or a specific identification on the substance of *jus cogens*. Second, if the latter policy were adopted, there would be a need to specify the favored norms while at the same time offering acceptable reasons for the rejection of the disfavored. Stated somewhat differently, the Commission might have offered specific examples of international legal

²⁸ W.T. Gangl, *The Jus Cogens Dimensions of Nuclear Technology*, 13 CORNELL INT'L L. J. 77 (1980).

²⁹ M. LACHS, *THE LAW OF OUTER SPACE*, chapters on "Rights and Obligations of States," "Responsibility," "The Law-Making Process," and "Conclusions," 113-152 (1972).

norms which, in their view, had achieved peremptory status, or it might have opted for an open-ended process permitting identification of such norms over time. The latter approach was adopted.

Judge Lachs was aware of these problems since it was evident that proponents of preferred international legal propositions would endeavor to find a home for their preferences within the realm of *jus cogens*. Judge Lachs addressed this issue by observing that it would be possible for everybody to "argue for or against the *jus cogens* character of any particular rule of international law."³⁰

This was resolved by the critical decision to refer, pursuant to Article 66 of the Vienna Convention, disputes concerning the application of Articles 53 or 64 to the World Court or to arbitration. Article 64, entitled "Emergence of a new peremptory norm of general international law (*jus cogens*)," provided "If a new peremptory norm of general international law emerges, any existing treaty which is in conflict with that norm becomes void and terminates."³¹

An American participant in the Vienna negotiations has indicated that "The inclusion of acceptable dispute settlement provisions relating to peremptory norms and to the whole of Part V [of the Convention] was the key to the successful conclusion of the Conference."³²

Candidates for Jus Cogens Status

The International Law Commission's decision to open the door to the identification of peremptory norms has fostered efforts to identify those subjects which appear to have gathered sufficient support to be characterized as *jus cogens* principles. Despite the unwillingness of the ILC and the Vienna Conference to confirm specific peremptory norms. Judge Lachs in his own words stated "I supported the suggestion to have the article in question [Article 53] enumerate a series of examples."³³ He favored inclusion of basic humanitarian principles and world order concepts. In the first category, he mentioned the prohibition of slavery, violations of the laws or customs of war, and of crimes against humanity including genocide and racial discrimination.³⁴ In the second category were the outlawry of piracy, aggressive war, the use of force, and

³⁰ See M. Lachs, *supra* note 1, at 210. Citing G. Schwarzenberger, *International Jus Cogens?* 43 TEXAS L. REV. 455 (1965).

³¹ *Supra* note 3.

³² R. Rosenstock, *Peremptory Norms -- Maybe Even Less Metaphysical and Worrisome*, 5 DENV. J. INT'L L. 167 (1975). For an account of national positions and votes taken on proposed articles at the Vienna Conference, see S. ROSENNE, *THE LAW OF TREATIES, A GUIDE TO THE LEGISLATIVE HISTORY OF THE VIENNA CONVENTION* 87, 290 (1970). The position of the United States has been described by R.D. Kearney and R.E. Dalton, *The Treaty on Treaties*, 64 AM. J. INT'L L. 536-538 (1970).

³³ See M. Lachs, *supra* note 1, at 340, n. 785.

³⁴ *Id.* at 206-208.

maintenance of the sacred trust established in the Covenant of the League of Nations whereby the well-being and development of peoples inhabiting former colonial areas and territories were to be furthered.³⁵ Lachs selected the foregoing for *jus cogens* status because they consisted of the obligations of a State towards "the international community as a whole. . . . In view of the importance of the rights involved, all states can be held to have a legal interest in their protection."³⁶

Judge Lachs in tracing the evolution of specific precepts referred to the writings of J.C. Bluntschli who argued that "*La pleine mer est ouverte au commerce et à la pêche de toutes les nations et de tous les individus.*"³⁷ By implication Judge Lachs endorsed the freedom of the seas principle as a peremptory norm.

The collective efforts of a number of highly qualified American experts provide important guidance respecting the substantive content of *jus cogens*. After noting that the content of *jus cogens* "is not agreed,"³⁸ it was suggested that *jus cogens* norms "might include rules prohibiting genocide, slave trade and slavery, apartheid and other gross violations of human rights, and perhaps attacks on diplomats."³⁹ Additionally, this body of lawyers emphasized that basic human rights might be accorded the protection of the *jus cogens* principle. Specific attention was drawn to genocide, slavery or the slave trade, the murder of or causing the disappearance of individuals, torture or other cruel, inhuman, or degrading treatment or punishment, prolonged arbitrary detention, and systematic racial discrimination.⁴⁰

The 1987 Restatement clearly considered "that the principles of the United Nations Charter prohibiting the use of force (Comment *h*) have the character of *jus cogens*."⁴¹ Additionally, Ago would include as examples of *jus cogens* "*protection des droits essentiels de la personne humaine en temps de paix et en temps de guerre . . . [and] les règles qui interdisant les atteintes à l'indépendance et à l'égalité souveraine des Etats. . . .*"⁴²

The principle of the sovereign equality of States is the historic basis for their freedom to engage in the use, exploration, and exploitation of the *res communis* areas and natural resources of the universe. Applying this to the ocean, Sir Hersch Lauterpacht wrote in 1950 that

³⁵ *Id.*

³⁶ *Id.* at 208, citing Barcelona Traction, Light and Power Company, Limited, Second Phase, Judgment, 1970 I.C.J. paras. 33, 34, 35.

³⁷ J.C. BLUNTSCHLI, *LE DROIT INTERNATIONAL CODIFIÉ*, 232 (3rd ed., 1881). M. Lachs, *supra* note 1, at 201.

³⁸ RESTATEMENT (THIRD), FOREIGN RELATIONS LAW OF THE UNITED STATES §102, Reporter's notes 6, 34 (1987).

³⁹ *Id.*

⁴⁰ *Id.* at §702, 161 and 167. Compare, R. Ago, *supra* note 1, at 324, n. 37.

⁴¹ *Supra* note 38, §102, *k.*, at 28. Compare R. Ago, *supra* note 1, at 324, n. 37.

⁴² R. Ago, *supra* note 1, at 324, n. 7.

"if a State were to proclaim an exclusive right of navigation, jurisdiction or exploitation of what is regarded by the generality of States as part of the high seas, the absence of protest would hardly make any difference to the legal position -- in the same way as the manifest illegality of any other action would preclude it from becoming a valid basis for precedent."⁴³

He urged that an effort to establish national sovereignty over submarine areas was "so wrongful in relation to any particular State or so patently at variance with general international law as to render [a national claim] wholly incapable of becoming the source of a legal right."⁴⁴

Judge Lauterpacht's observations have relevance to the international law of outer space. The high seas like the geographical reaches of outer space constitute *res communis* areas. To the extent that the world community derives particular advantage from according *jus cogens* status to the freedom of the high seas it may be urged that the same *jus cogens* status would advance mankind's best interests in outer space. Such reasoning is supportable by the basic policy underlying the principle of peremptory norms, namely, that they are to be applied to serve basic interests, values, wants, and needs.

Support for this conclusion is to be found in Sir Humphrey Waldock's characterization of the *jus cogens* principle. In his 1963 report to the ILC, he indicated that the substantive content of the *jus cogens* principle was "not immutable and incapable of abrogation or amendment in the future."⁴⁵

Professor Jiménez de Aréchaga in raising the question of whether an international agreement authorizing the act of piracy would be sustainable concluded that such an agreement would be "void."⁴⁶ Moreover, since *jus cogens* is a living principle "the traditional definition of piracy may be extended to cover hijacking of aeroplanes or the opium and drug conventions expanded to include synthetic drugs."⁴⁷

Writing in 1965 C.W. Jenks treated *jus cogens* as having a foundation in international public policy. Applying this premise to outer space activities, he concluded that "the prohibition of appropriation [of

⁴³ H. Lauterpacht, *Sovereignty over Submarine Areas*, 27 BRIT.Y. B. INT'L L. 388, citing in support P. Guggenheim, *La Validité et la Nullité des Actes Juridiques Internationaux*, 74 R.C.A.D.I. 195 (No. 1, 1949).

⁴⁴ *Id.* at 397. Although the word "void," which is used in Article 53 of the Vienna Convention, was not employed, this seems to be the import of Lauterpacht's reasoning.

⁴⁵ 2 Y.B. INT'L. L. COMM'N 53 (1963).

⁴⁶ E. Jiménez de Aréchaga, *International Law in the Past Third of the Century*, 159 R.C.A.D.I. 67 (No. 1, 1978).

⁴⁷ *Id.*

outer space and celestial bodies] rests essentially on grounds of international public policy."⁴⁸

Of special interest to the students of the international law of outer space is the suggestion of Judge Ago. In 1972 he identified as peremptory norms "*les règles qui assurent à tous les membres de la communauté internationale la jouissance de certains biens communs (haute mer, espace extra-atmosphérique, etc.)*"⁴⁹

In 1977 Marjorie M. Whiteman, following a review of the emergence of the *jus cogens* principle, presented a list of subjects which she described as offering a "serious challenge" to persons qualified to identify such principles. Among them was "appropriation of outer space and/or celestial bodies."⁵⁰

Writing in 1979 Professor Kolosov pointed to the role of customary international law in filling in the substance of *jus cogens* principles. His observations were directed specifically at orbital activity as it had developed. It was Kolosov's view that even before the entry into force in 1967 of the Principles Treaty⁵¹ the *jus cogens* principle required that "outer space shall be open to exploration and exploitation by all nations without any discrimination whatsoever, on the basis of equality, and that it is not subject to national appropriation by claims of sovereignty over it by use or occupation or by any other means."⁵²

In 1980 Professor Marcoff made brief mention of *jus cogens* in a space law context.⁵³ In 1983 the present author suggested that Article 1, and, in particular, paragraphs 1 and 2, and Article 2 of the 1967 Principles Treaty⁵⁴ met the enumerated criteria for *jus cogens* status.⁵⁵ Following the 1983 presentation to the International Institute of Space Law, Judge Lachs joined in the discussion and was supportive of the proposal.

As time has gone on there have been assertions that the *jus cogens* norm appertains to more than the suggested paragraphs of Article 1 and

⁴⁸ C.W. JENKS, *SPACE LAW* 200 (1965).

⁴⁹ R. Ago, *supra* note 1, at 324, n. 37.

⁵⁰ M.M. Whiteman, *Jus Cogens in International Law, with a Projected List*, 7 GA. J. INT'L & COMP. L. 626 (1977).

⁵¹ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967 (entered into force for the United States Oct. 10, 1967), 18 UST 2410; TIAS 6347; 610 UNTS 205 (hereinafter Principles Treaty).

⁵² Y. Kolosov, *Legal and Political Aspects of Space Exploration*, INT'L AFF. (Moscow) 88 (March 1979). The last clause of the quotation almost perfectly paraphrases art. 2 of the Principles Treaty. The first clause captures the essence of art. 1, para. 2 of the Treaty.

⁵³ M.E. Marcoff, *Sources du droit international de l'espace*, 168 R.C.A.D.I. 83, 100 (No. 3, 1980).

⁵⁴ *Supra* note 51.

⁵⁵ C.Q. Christol, *Jus Cogens Principle and Space Activities*, 26 PROC. COLLOQ. L. OUTER SPACE 1-9 (1984), reprinted in C.Q. CHRISTOL, *SPACE LAW: PAST, PRESENT, AND FUTURE* 443 (1991).

Article 2 of the Principles Treaty. In 1986 the representative of Chile to the Legal Sub-Committee of the United Nations Committee on the Peaceful Uses of Outer Space, Mr. Gonzalez, urged that the terms of Articles 3 and 4, as well as 1 and 2, and additionally paragraph 1 of Article 11 of the 1979 Moon Agreement⁵⁶ occupied *jus cogens* status.⁵⁷ In 1988 Professor Hannikainen, in a very comprehensive analysis concluded that there is a "presumption of the peremptory character of the prohibition of national appropriation of areas of outer space, including celestial bodies."⁵⁸

Recently, A.D. Terekhov has suggested that a violation of Article 6 of the 1967 Principles Treaty or of a *jus cogens* principle would enable an aggrieved party to invoke the principle of international responsibility.⁵⁹

Conclusion

It is evident that there has been a rather limited effort on the part of space law experts, and by other international lawyers to obtain *jus cogens* status for the fundamental provisions contained in Article 1 of the 1967 Principles Treaty. The guarantee to all States of free and equal access to outer space and to celestial bodies and the right to engage in the exploration, use, and exploitation of the area and its resources is so fundamental to the achievement of the province of mankind principle that these guarantees deserve the status of peremptory norms. The same can be said of the *res communis* principle appearing in Article 2 of the same agreement. The fact that the candidacy of these principles has been rather dormant and that the World Court has not been called upon to give its stamp of approval should not lead to the conclusion that these central guarantees do not qualify for *jus cogens* status.

To effect such a result it will be necessary to reach agreement on the suitability of the criteria mentioned above. Following this it will be necessary to obtain the focused attention of international lawyers, both specialists in the space law field and generalists, so that informed decisions can be taken. In approaching such a task a case will have to be made that the foregoing principles are, in the words of Article 53 of the Convention on Treaties, "norm[s] accepted and recognized by the international community of States as a whole..."⁶⁰ Justification for this conclusion can rest on the larger proposition that such a result falls within the universal conscience of mankind.

56 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, U.N. Doc. A/RES/34/68, 14 Dec. 1979; 18 I.L.M. 1434 (1979).

57 U.N. Doc. A/AC.105/C.2/SR.439, at 3 (5 April 1986).

58 L. Hannikainen, *supra* note 1, at 591.

59 A.D. Terekhov, *International Responsibility for Using Nuclear Power Sources in Outer Space -- Reflections on the Text Adopted by COPUOS*, 34 PROC. COLLOQ. L. OUTER SPACE 147 (1992).

60 *Supra* note 3.

Aside from the novelty of the "province of mankind" concept in Article 1 of the Principles Treaty the remaining substantive provisions, as well as the terms of Article 2, were statements of general international law. Free and equal access to non-sovereign areas and the *res communis* principle applicable to the ocean are assured by customary international law and by formal international agreements.

Both legal theory and practical experience have suggested that free and equal access to the *res communis* area of the ocean qualifies for *jus cogens* status. Because of the similarities with the exploration, exploitation, and use of outer space and its natural resources with ocean activities, the former should also enjoy *jus cogens* status. Although the historic experience with outer space is more limited than that of the free uses of the ocean, yet otherwise and in many respects, the parallels are striking.

Judge Lachs was a versatile and innovative jurist. His long involvement in international space law, as reflected in his high offices and his critical writings, have identified him as a singularly authoritative figure in the field.

His thoughtful analysis of the legal issues of his time, which have lent themselves to the progressive development of international law, is and will remain especially significant in the years ahead. The fact that he allocated the subject of *jus cogens* a chapter out of the 15 chapters in his 1984 lectures at The Hague is evidence of the importance he attached to the subject.

He was clear that the substantive principle of *jus cogens* was a vibrant and living element of international law, one that was rich in its prospects for progressive development. In this respect his challenge to the future is quite simple.

Manfred Lachs might have said something like this:

"The members of the international legal community, in order to serve the universal conscience of mankind and to achieve the security resulting from the employment of orderly legal processes, must participate actively in the creative challenges provided by law. This is expected. Nothing less will be allowed."

HUMAN SETTLEMENTS ON PLANETS; NEW STATIONS OR NEW NATIONS

Dr. Ernst Fasan*

I. Introduction

In his famous book of 1972, *Manfred Lachs* extensively discussed "the legal situation of objects launched into outer space" and of astronauts¹ and raised the question whether all objects launched into outer space should be placed in a common legal category.² He pointed out that there is a difference between the notions of "jurisdiction," on the one hand, and "control," on the other hand,³ although these two terms are usually quoted together in the space treaties and agreements.

Lachs indicated that space law does not follow the old maritime rule of the "law of the flag" but is based on jurisdiction of the state under whose registry a space object is launched.⁴ Already, he foresaw the old conflict between territorial and personal jurisdiction and quoted as an example the "rights of United States nationals in Morocco."⁵ He also envisaged emerging problems of space objects permanently established on a celestial body, including the possible changes in ownership which, *inter alia*, would require corresponding changes in the registry with all that this would imply.⁶

If we want to look into future contingencies, we need not be too "science fictioneerish." Plans for a manned mission to Mars within 30 years have already been published. H.H. Koelle, the chairman of the Subcommittee on Lunar Development of the International Academy of Astronautics, recently mailed out a scenario foreseen for the second half of the 21st century which indicates a fully grown lunar settlement with more than 1000 permanent residents.⁷

Before embarking on a discussion of future legal problems, a brief examination of the present legal situation is in order.

* Attorney at Law, Neunkirchen, Austria; Hon. Director, International Institute of Space Law (IAF); Member, Ed. Board, JOURNAL OF SPACE LAW.

1 MANFRED LACHS, *THE LAW OF OUTER SPACE* (Sijthoff 1972).

2 *Id.* at 68.

3 *Id.* at 69.

4 *Id.* at 70.

5 *Id.* at 75. (Quoting, 1952 I.C.J. 191).

6 *Id.* at 73.

7 Communication No. 3-93 (July 1993); An earlier version is quoted by Vladimir Kopal, *Some Legal Aspects of the Return to the Moon and Expected Flights to Other Celestial Bodies*; (IAA Paper 0047/1992, Washington, D.C., 1992); see also "Mars Exploration," IAA Symposium at the 44th International Astronautical Congress (Graz, 1993), *Brief News*, 18 J. SPACE L. 188 (1990).

II. Manned Space Stations de Lege Lata

Already the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space including the Moon and other Celestial Bodies of Oct. 10, 1967, known as the Outer Space Treaty, established, among others, the following space legal principles.

a) National appropriation of outer space, including the Moon and other celestial bodies is prohibited, but their exploration and use is permitted;⁸

b) States are responsible for national activities (and activities of their nationals) in outer space⁹ and are internationally liable for damage;¹⁰

c) States "shall retain jurisdiction and control over space objects and over any personnel thereof, while in outer space or on a celestial body" and retain ownership over space objects;¹¹

d) A "registration" of space objects is envisioned.

The following space legal agreements repeat these legal principles in a greater detail and a clearer language:

a) the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space;¹²

b) the Convention on International Liability for Damage Caused by Space Objects;¹³

c) the Convention on the Registration of Space Objects Launched into Outer Space;¹⁴

d) the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.¹⁵

⁸ Arts. I and II.

⁹ *Id.* at art. VI.

¹⁰ *Id.* at art. VII.

¹¹ *Id.* at art. VIII.

¹² Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, April 22, 1968, 672 U.N.T.S. 119 (hereinafter "Rescue Agreement").

¹³ Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 961 U.N.T.S. 187 (hereinafter "Liability Convention").

¹⁴ Convention on the Registration of Objects Launched into Outer Space, Jan. 14, 1975, 1023 U.N.T.S. 15 (hereinafter "Registration Convention").

¹⁵ Agreement Governing the Activities of Objects Launched into Outer Space, adopted by the U.N. Gen. Assembly on December 5, 1979, opened for signature on Dec. 18, 1979, entered into force July 11, 1984 (not in force for the United States), U.N. Doc. A/RES/34/68 (1979) [hereinafter "Moon Agreement"].

There is, then, no doubt that according to existing space law the following provisions do apply to space stations and their crews:

i) space objects, and especially manned stations established on a celestial body, remain under the ownership, jurisdiction and control of the state of registry;

ii) personnel of a spacecraft remains under the jurisdiction of their own nation and will have to be safely and promptly returned to representatives of the launching authority.

Only the first manned journeys into outer space were conducted within the national activity of one state only, and with personnel of the launching state only. Later on, both USA and former USSR started launching objects with mixed crews into outer space. However, all these space flights only lasted for a limited time, and no station has been established on another celestial body as yet, whether with a crew from one nation only or from two or more nations.

More recently, planned progress in space activities has brought about the notion of "permanently manned civil space stations (for peaceful purposes), on the one hand, and deep space missions - especially to moon and Mars - on the other hand.¹⁶

For the purpose of regulating problems which would arise or could be foreseen during future international space activities, the Governments of the United States of America, the Member States of the European Space Agency, Japan and Canada signed on Sept. 29, 1988, the "Agreement on Cooperation in the detailed Design, Development, Operation, and Utilization of a permanently manned civil Space Station", the so-called Space Station Freedom Agreement.¹⁷ The following legal principles included therein are of interest:

a) Each partner shall register as space objects the flight elements it provides; and it shall retain jurisdiction and control over those elements.¹⁸

b) Each partner has the right to provide qualified personnel.¹⁹

c) There is agreement on a "Cross-Waiver of Liability".²⁰

d) Detailed regulations regarding intellectual property are provided.²¹

e) Regarding personnel there are two explicit provisions:

¹⁶ See references at *supra* note 7.

¹⁷ For a text of the Agreement on Cooperation in the detailed Design, Development, Operation, and Utilization of a permanently manned civil Space Station see U.S. Senate Committee on Commerce, Science and Transportation, SPACE LAW AND RELATED DOCUMENTS 151ff. (1990).

¹⁸ *Id.* at art. 5.

¹⁹ *Id.* at art. 11 (1).

²⁰ *Id.* at art. 16.

²¹ *Id.* at art. 21.

i) While all flight partners may exercise criminal jurisdiction over their respective nationals and generally retain jurisdiction over them, then the following sentence is added: "In addition, the United States may exercise criminal jurisdiction over misconduct committed by a non U.S. national in or on a non-U.S. element of the manned base....which endangers the safety of the manned base or the crew members thereon". However, before trial consultations and concurrence of the relevant partner are called for.²²

ii) It is foreseen that a "Code of Conduct for the Space Station Crew, to be developed by all the partners" will be developed.²³ Such a code, however, has not yet been published.

The dissolution of the former USSR brought about the "Minsk Agreement" of December 30, 1991 between the Russian Federation and eight other States of the former Soviet Union. The parties to this agreement pledge to cooperate regarding future (military and civilian) space activities in accordance with international law, with respect to the training of cosmonauts and sharing of costs. They pledge to provide persons, facilities and funds. Special norms of retaining jurisdiction over space flight personnel, however, are not given.²⁴

III. The Necessity for New Regulations

Although the space treaties and agreements as quoted above do not deal expressly with "objects....constructed on a celestial body," it has been questioned, whether such objects or installations would remain space objects with all relevant legal implications. Even a spacecraft - surely a space object - after having landed on a celestial body and after disembarkation might no longer be considered a "space object."

Thus *Stephen Gorove* posed the following question:

First and foremost, the question arises whether an object launched from Earth would lose its legal characterization as a Space Object upon its landing on the Moon, or Mars or another Celestial Body: Would a moon rover or other movable objects, equipment or supplies originating from the Earth cease to be Space Objects and would the relevant space treaty provisions not be applicable to them following such landing? Or would such objects continue to remain space objects and, if so, for how long?

²² *Id.* at art. 22 (2).

²³ *Id.* at art. 11 (2).

²⁴ ECSL Laws, Doc. ISSN 1013-9036 (1993).

He deems it doubtful whether even a movable space object, being made into becoming part of an immovable structure in the form of a station or facility on a Celestial Body would continue to be regarded as a space object.²⁵

Thus the exercise of a firm grip by the launching state (state of registry) over durable stations on a celestial body and over the personnel therein might not remain a certainty, and from this, legal consequences might arise.

Especially, the "Draft for a Convention on Manned Space Flight" deals with "Manned Space Flight Operations," including the "embarkation, launch, in orbit, reentry, landing and disembarkation phases." For such space missions a commander shall be appointed to exert sole authority throughout the flight and to use any reasonable and necessary means to achieve the safety and well-being of all persons on board.²⁶

Such authority for a space station commander, a proper "code of conduct" once established as well as the multitude of problems that may arise will bring about contingencies not yet experienced and possibly not yet foreseen.

These contingencies will not necessarily arise in all severity regarding space stations in orbit around the Earth or fixed stations on the moon. For such stations could be reached from the surface of the Earth within a few days or even hours. The state of registry would never lose the practical possibility of exerting its jurisdiction and control.

But regarding a possible permanent station on Mars or other planets, the factual situation will be vastly different.

Even under optimal conditions (during the time of a "starting window") a flight to Mars would require months.²⁷ This same window would not be usable for the return flight. Either a long waiting period or a substantially prolonged time of flight would ensue. All in all, the exercise of actual control and jurisdiction over a Mars station and/or its personnel by a state of registry would require several years.²⁸

I do not believe that this scenario could be envisioned as actually having the possibility for an exercise of control.

Therefore, we have to ponder this situation in the light of general international law.

IV. New Code of Conduct - Basis For a New Constitution?

For many years, leading authorities in the field of space law have foreseen problems which would arise in connection with permanently

²⁵ 21 J. SPACE L. 11 (1993).

²⁶ Research project of Böckstiegel, Vereshchetin and Gorove. For a text of the Draft, see 18 J. SPACE L. 209ff. (1990).

²⁷ SAENGER, RUMFAHRT HEUTE-MORGEN-ÜBERMORGEN, (Econ Verlag).

²⁸ *Id.* at 266.

manned stations on celestial bodies. We may (in alphabetical order) refer to the papers of Christol,²⁹ Gorove,³⁰ Kopal,³¹ Matte,³² Sterns and Tennen,³³ Vereshchetin,³⁴ and Vitt.³⁵

Regarding future permanently manned space objects, there are, as we have seen, two very different categories:

a) Objects near Earth (such as Space Station Freedom, and even a permanently manned lunar station) will carry personnel which may return (or be returned) back to the home planet within a few days, if necessary. Even if an installation on the moon is populated by hundreds of people, there is no factual severance necessary from Earth and its authorities.

b) Inhabitants of manned stations on Mars or its moons or on an asteroid³⁶ or on any other celestial body within our solar system will have to travel there, stay there and remain off the Earth for several years, at a minimum.

If we establish such a station on Mars, crews of different nations, and of both sexes, will be on board. Married couples will live there and bear children; but married couples may divorce, and new liaisons (marriages or others) might be formed.

The "code of conduct" will then not be restricted to questions of criminal laws and property laws, but "ultimate principles of social orders in space communities" will evolve.

²⁹ Carl A. Christol, *Space Stations: Present and Future*, 17 PROC. COLLOQ. L. OUTER SPACE 364 (1975).

³⁰ Stephen Gorove, *Legal Aspects of Stations in Space*, in SPACE STATIONS - LEGAL ASPECTS OF SCIENTIFIC AND COMMERCIAL USE IN A FRAMEWORK OF TRANSATLANTIC COOPERATION 143ff. (K.-H. Böckstiegel ed. 1985); STEPHEN GOROVE, STUDIES IN SPACE LAW - ITS CHALLENGES AND PROSPECTS 211ff. (Sijthoff 1977). See also Katherine Gorove, *The U.S./International Space Station Agreement of Sept. 29, 1988: Some Legal Highlights* 15 J. SPACE L. 182ff. (1988).

³¹ Vladimir Kopal, *Some Legal Aspects of the Return to the Moon and Expected Flights to other Celestial Bodies* (IAA Paper 92-0047, Washington, D.C. 1992).

³² Nicholas M. Matte, *Space Stations: A Peaceful Use for Humanity?*, 10 ANNALS AIR & SPACE L. 434ff. (1985).

³³ P.M. Sterns & L.I. Tennen, *International Recognition of the "Art of Living in Space": The Emergence of Settlement Competence*, 22 PROC. COLLOQ. L. OUTER SPACE 221 (1979). P. M. Sterns & L.I. Tennen, *Jurisprudential Philosophies of the Art of Living in Space, the Transnational Imperative* 25 PROC. COLLOQ. L. OUTER SPACE 187ff. (1982).

³⁴ Vladlen Vereshchetin, *Mir: A Soviet Space Station, Some Legal Aspects of International Cooperation*, PROC. COLLOQ. L. OUTER SPACE 53ff. (1988).

³⁵ Von Elmar Vitt, *Die Weltraumkolonie*, in HANDBUCH DES WELTRAUMRECHTS 579ff. (Karl-Heinz Böckstiegel ed., Carl Heymanns Verlag 1991).

³⁶ Ernst Fasan, *Large Space Structures and Celestial Bodies*, 27 PROC. COLLOQ. L. OUTER SPACE 243ff. (1985).

Personnel of a Mars station will become inhabitants of such a station. The exercise of jurisdiction and control by the state (or states) of registry may become difficult, it may even become impractical and impossible. States may realize that. It may be impractical, to sacrifice billions of dollars and years of time simply to send a spaceship to Mars in order - for instance - to bring a criminal home for trial or to solve civil disputes, or to replace an incapacitated (or undesired) station commander, etc.

On the other hand, new bonds of common interests will necessarily develop between crew members of different nations. Children may be born from international marriages who will have to be raised and educated, and it might prove difficult to establish their nationality in relation to the relevant states of registry.

Conflicts of interests between the states of registry on Earth and the common interests of a crew on a distant space station may develop. Such conflicts may increase, if and when such a station would become autarchic and self sufficient.

It may not be necessary, to repeat the mistakes that led to former frictions between colonies and their homelands. At the same time, one should not foresee some "wars of independence." The vast distances from home would render such wars absolutely senseless. The development of international law and the continuing awareness of being humans from the same home planet would and should prevent this.

There still would remain strong ties with the home countries. Scientific exploration on the planet, on the one hand, and exploitation of possible resources of this planet, on the other, would - irrespective of the vast distances - prove to be a strong connection between the related planet and Earth.

However, with the passage of time, more and more the space station - a true human settlement - would create its own rules.

Once the manned space station has become a lasting settlement on a planet and a new generation grows there and once a new feeling of solidarity with other crew members surpasses the emotional links to the home state, the question may arise if and when such a community might become a new nation in itself.

There is no question that a recognition by other nations - even an acceptance in the community of nations - for instance the U.N., would be proof that a new nation did arise. But according to many theories, recognition by other states is only of a declaratory nature.³⁷ International law has created certain conditions for a new "State" coming into existence.³⁸

³⁷ A. VERDROSS, *VÖLKERRECHT* 183ff. (Springer 1959).

³⁸ *Id.* at 1980ff; SCHLOCHAUER, *WÖRTERBUCH DES VÖLKERRECHTS*, 44ff. (W. de Gruyter 1960).

Is has been said that the "inner sovereignty" is "prior to and independent of the Treaty."³⁹

A new state must necessarily have its own territory, it must have its own people, and it must have its own national organization which is adhered to by the people (notion of effectivity).⁴⁰ A state (even prior to recognition) must have a kind of organization, which enables it to live according to international law. If then recognition by other states follows, this would be the declaratory consequence.

There does exist an interrelation between the act of recognition, on the one hand, and the starting of international diplomatic relations, on the other hand.⁴¹

Recognition in itself is a unilateral act of another nation (or more of them) and this may or may not be a part of a new international treaty between the recognizing nation and the (newly) recognized state.

But the notion of effectivity may give independence to a new state even without (or before) the occurrence of first acts of recognition by third parties.

Regarding the new national territory, difficulties may arise with regards to the non - appropriability of celestial bodies, as discussed above.⁴²

But once more here, facts will have normative power. An area on the celestial body will be inhabited; its minerals will be used; inhabitants will move through such territory, and the "rules of conduct" will be valid within such an area.

There is of course, no example in human history applicable to our problem. However, the legal history of the Union of South Africa and, especially, of the Free State of Oranje and of Transvaal demonstrate how a *defacto* development may lead to an independent nation.

The appearance of the Lowlanders around Cape Town in the 17th Century resulted in a fixed settlement, extending its territory more and more toward the East and the North. Even after Great Britain's occupation of Cape Province, and even after the Treaty of August 13, 1814 between the Netherlands and Great Britain, settlers developed regions which later became the territories of the Free State of Oranje and of Transvaal, as mentioned above. Both territories constituted themselves as independent republics and only during the Boere War (1899 - 1902) did they lose their independence.⁴³

³⁹ A. VERDROSS, *supra* note 37, at 182.

⁴⁰ SCHLOCHAUER *supra* note 38, at 48.

⁴¹ A. VERDROSS, *supra* note 37, SCHLOCHAUER, *supra* note 38.

⁴² See art. II of the Outer Space Treaty. The notions of "province of all mankind," "common heritage of mankind," and "international regime" seem to point into another direction. But exploration, use and exploitation of planetary resources will nevertheless bring about factual situations similar to an exclusive administration of certain planetary areas.

⁴³ SCHLOCHAUER, *supra* note 38, at 408.

This example illustrates the coming into existence of these new nations in uncivilized territories. When the Boores moved across the Vaal River, they surely had no fixed plans to become a new nation. Things developed gradually. The same may be true for a settlement, for instance, on Mars.

The severance of such a human settlement on a planet from its home nations (states of registry) by virtue of the enormous distances, the increasing coherence of its members both socially and economically, and the common defense against a hostile environment may build the basis for the emergence of a new organized community.

This may lead to the feeling of "inner sovereignty" among a clearly defined group of people, namely, the inhabitants of the said Mars station. The group of people will have a kind of administrative organization - be it under a "Station Commander" or under any other kind of administrative guidance.

There will have to be some rules, surpassing the "Code of Conduct", and these may become the basis of a new constitution and a new legal system.

Not so easy is the question of national territory to be solved. For as we have learned, celestial bodies are not subject to national appropriation. However, within the borders of the station itself, within the limits of the main activity of this station's personnel in the surrounding areas, a kind of clearly permitted use of a land area will exist.⁴⁴ This use will be an exclusive one, because there will not be any competitions, unless we imagine more than one such station in the same stage of development. "Territory" (or rather "areatory") will be available in vast quantities. Therefore, this question of national territory will not be of extreme importance.

If then the inhabitants of such a station decide to act as a community, even toward the old states of registry and if, on the other hand, those states of registry have loosened their influence due to the vast distances, the main conditions for the emergence of a new nation may be there. As a result, and very likely, a kind of "Declaration of Independence" might follow. The new station will thus become a New Nation.

⁴⁴ Art. I of the Outer Space Treaty; Art. 2 of the Moon Agreement.

SOME CONSIDERATIONS ON THE LEGAL STATUS OF AEROSPACE SYSTEMS

Vladimir Kopal*

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.

* Professor of International Law, Doctor of Sciences, Prague, Czech Republic; General Counsel, International Astronautical Federation (IAF); Director, International Institute of Space Law (IISL). Member: International Academy of Astronautics (IAA); Ed. Board & Advisers, JOURNAL OF SPACE LAW..

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 by the French Society for Air and Space Law (La Société Française 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

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 ET 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 Subcommittee⁵ 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

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 project⁹ 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:

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 1944¹³ 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

¹¹ "Il se peut que les avions aérospatiaux se distingueront des véhicules spatiaux habités actuels par leur phase ascensionnelle, l'étape 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, 398ff. (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 1975¹⁴ 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

¹⁴ The Convention entered into force on 15 September 1976. See its text in *THE UNITED NATIONS TREATIES ON OUTER SPACE* 22ff. (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 1944 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

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 3ff.

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

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 Autónoma 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

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* 45ff. (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 183ff. and 215ff.

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 1972²⁵ 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"

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

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

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.

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* 363ff. (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 Suisse 1973). See also Bin Cheng, "Space Objects", "Astronauts" and Related Expressions, 34 *PROC. COLLOQ. L. OUTER SPACE* 17ff. (1991) and S. Gorove, *Toward a Clarification of the term "Space Object" - An International Legal and Policy Imperative?*, 21 *J. SPACE L.* 11ff. (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

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 there 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

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

³⁵ C. Q. Christol, *The Aerospace Plane and the Definition and Delimitation of Outer Space*, a paper presented to Centro de Investigación 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

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 3ff. (1991). See also S. Gorove, *Major Definitional Issues in the Space Agreements*, 35 PROC. COLLOQ. L. OUTER SPACE 76ff. (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

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.

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).

LIABILITY OF AEROSPACE MANUFACTURERS: *MacPherson v. Buick* SPUTTERS INTO THE SPACE AGE

Phillip D. Bostwick*

Introduction

In 1915 Donald MacPherson took his Buick motor car out for a drive on New York roads. He had purchased the car new from a retail car dealer in New York, who had purchased it from the manufacturer, Buick Motor Company. While traveling at a speed of eight miles per hour MacPherson was thrown from the car and injured when it collapsed after one of the wooden spokes in one of the car's wheels crumbled into fragments. MacPherson brought suit against the manufacturer. Evidence introduced at the trial showed that the wooden spoke that failed was made of defective wood, and that its defects could have been discovered by reasonable inspection. Buick had purchased the wheel from a component manufacturer, the Imperial Wheel Company of Flint, Michigan, which had previously supplied Buick with eighty thousand defect-free wheels. There was evidence that neither Imperial nor Buick had inspected MacPherson's wheel for defects.

MacPherson's problem was that the applicable rule of law prevailing in New York and in the majority of other states in 1915 came from an English case decided in 1842. In *Winterbottom v. Wright*¹ the court held that there could be no action, even in tort, for the misperformance of a contract of sale of a chattel in the first instance.² An exception to this rule had been created in New York in 1852 in *Thomas v. Winchester*,³ a case holding a seller liable to a third person for negligence in the preparation or sale of an article "imminently" or "inherently" dangerous to human safety.⁴ But the firmly-established rule facing MacPherson in 1915 when he sued the Buick Motor Company was that the original seller of goods was not liable for damages caused by their defects to anyone except his immediate buyer, in this case the retail car dealer, or

* Senior partner in the Washington, D.C. law firm of Shaw, Pittman, Potts & Trowbridge. Mr. Bostwick specializes in litigation, space, aviation and insurance matters, and was chief trial and appellate counsel for certain satellite insurers in *Appalachian Ins. Co., v. McDonnell Douglas Corp.*, 214 Cal. App. 3d 1, 262 Cal. Rptr. 716 (1989); *Lexington Ins. Co., v. McDonnell Douglas Corp.*, No. 481713 (Orange Co. Super. Ct.); and *Western Union Corp. v. Lexington Ins. Co.*, C.A. No. 91-193 (JWB) (D.N.J.), three of the cases discussed in this article.

¹ 10 M & W 109, 152 Eng. Rep. 402 (1842).

² See generally, 68 PROSSER & KEETON ON THE LAW OF TORTS, § 96 at 681 (5th ed. 1984) (hereafter "PROSSER & KEETON").

³ 6 N.Y. 397 (1852).

⁴ PROSSER & KEETON, *supra*, note 2, at 682.

to one in privity with him. Reasons given in support of the rule included the notion that an intervening resale by a responsible party "insulated" the negligence of the manufacturer. They also included the view, typical in the nineteenth century, that it would place too heavy a burden on manufacturers to hold them liable to large numbers of unknown persons, and that it was better to let the consumer suffer.⁵

Luckily for MacPherson, his case ultimately found its way to the desk of Benjamin Cardozo, then a judge on New York's highest court, the New York Court of Appeals. In the words of Dean Prosser, Cardozo's opinion "struck through the fog of the 'general rule' and its various exceptions and held the maker liable for negligence."⁶ The reasoning and the fundamental philosophy expressed by Judge Cardozo in *MacPherson v. Buick Motor Co.*,⁷ were that the manufacturer, "by placing the car upon the market, assumed a responsibility to the consumer, resting not upon the contract but upon the relation arising from his purchase, together with the foreseeability of harm if proper care were not used."⁸ Judge Cardozo wrote:

We are dealing now with the liability of the manufacturer of the finished product, who puts it on the market to be used without inspection by his customers. If he is negligent, where danger is to be foreseen, a liability will follow. . . . There is here no break in the chain of cause and effect. In such circumstances, the presence of a known danger, attendant upon a known use, makes vigilance a duty.

Precedents drawn from the days of travel by stage coach do not fit the conditions of travel today. The principle that the danger must be imminent does not change, but the things subject to the principle do change. They are whatever the needs of life in a developing civilization require them to be.⁹

Three-quarters of a century after Judge Cardozo wrote his landmark opinion in *MacPherson v. Buick* it is difficult for us to imagine a time when life in the United States was governed by the rule of *Winterbottom v. Wright*. After *MacPherson* the law of products liability went on to develop the concept of strict liability, first in contract for breach of warranty,

⁵ *Id.* at 681-82.

⁶ *Id.* at 682.

⁷ 217 N.Y. 382, 111 N.E. 1050 (1916).

⁸ PROSSER & KEETON, *supra* note 2, at 683.

⁹ 217 N.Y. at 386, 111 N.E. at 1054 (1916).

express or implied,¹⁰ and later strict liability in tort for physical harm to persons and tangible things.¹¹

The first case involving liability of an aerospace manufacturer for a defective product malfunctioning in space was filed in California state court in January 1986, *Appalachian Ins. Co., v. McDonnell Douglas Corp.*,¹² In the eight years since the *Appalachian* case was filed a number of other cases involving the liability of aerospace manufacturers for their malfunctioning or defective products have been litigated in courts in the United States. Some of the claimants in these cases probably felt the way MacPherson did when he filed suit against the Buick Motor Company in 1915. This article reviews some of these cases and some of the issues and legal rulings involved in them. It concludes from this review that liability of aerospace manufacturers for their malfunctioning and defective products, while in its infancy, is becoming established; and it forecasts that a slow but steady reallocation of the risk of loss resulting from these malfunctioning products will occur in the future between aerospace manufacturers and the purchasers and users of their products.

A. Interparty Waivers of Liability

1. NASA's Interparty Waivers

On February 3, 1984, the Space Shuttle Challenger lifted off from its launch pad at Cape Kennedy with two commercial telecommunications satellites in its cargo bay -- WESTAR VI owned by Western Union Corporation and PALAPA B-2 owned by the Government of Indonesia. Each satellite had attached to it a Payload Assist Module ("PAM-D") manufactured by McDonnell Douglas Corporation. The PAM-D constituted the third stage booster, or perigee kick motor ("PKM"), of the launch vehicle. The purpose of the PAM-D was to place the spacecraft in a transfer orbit following deployment of the spacecraft from the Shuttle while it was in a parking orbit around the earth. The major component of the PAM-D was its STAR 48 solid rocket motor ("SRM"), manufactured for McDonnell Douglas by Morton Thiokol, Inc. The nozzle, or exit cone, of the STAR 48 was manufactured for Morton Thiokol by HITCO. The exit cones on the PAM-Ds attached to WESTAR VI and PALAPA B-2 were new carbon-carbon nozzles utilizing an "involute" design. They were replacing McDonnell Douglas's older, heavier but very reliable carbon phenolic exit cones made by the "tape-wrapped" process.

The nominal burn time for the PAM-D's STAR 48 SRM was 85 seconds. Following deployment of WESTAR VI from the Shuttle on February 3, 1984, its PAM-D was ignited. Approximately five seconds after ignition the carbon-carbon exit cone disintegrated completely

¹⁰ See generally, PROSSER & KEETON, *supra* note 2, § 95, at 677.

¹¹ See RESTATEMENT (SECOND) OF TORTS § 402A.

¹² No. 481712 (Orange Co. Super. Ct.).

resulting in WESTAR VI going into a low "failed" elliptical orbit around the earth. In such an orbit it was useless as a telecommunications satellite. Three days later the crew of the Challenger deployed PALAPA B-2 and its PAM-D was ignited. The carbon-carbon exit cone of the Indonesian satellite's STAR 48 SRM also disintegrated completely approximately five seconds after ignition, leaving PALAPA B-2 in a failed orbit nearly identical to that of WESTAR VI.

Both satellites were insured and the insurers paid Western Union and the Government of Indonesia over \$200 million for these two launch failures. Some of the insurers of WESTAR VI filed a subrogation action against McDonnell Douglas, Thiokol and HITCO alleging strict liability in tort, negligence and breach of warranty. *Appalachian Ins. Co. v. McDonnell Douglas Corp.*, *supra*. Some of the insurers of PALAPA B-2 filed a similar action in the same court at the same time against the same defendants. *Lexington Ins. Co. v. McDonnell Douglas Corp.*¹³

Both Western Union and the Government of Indonesia (through its agency PERUMTEL) had entered into Launch Service Agreement contracts ("LSAs") with the National Aeronautics and Space Administration ("NASA") in connection with the launches of their satellites on the Shuttle. In these LSAs NASA had insisted that Western Union and PERUMTEL agree to "a no fault, no subrogation, interparty waiver of liability" clause. The clause in PERUMTEL's LSA was an earlier, "limited" interparty waiver clause;¹⁴ the one in Western Union's LSA was a later, "extended"

¹³ No. 481713 (Orange Co. Super. Ct.).

¹⁴ The "limited" interparty waiver clause in the NASA-PERUMTEL LSA reads as follows:

In carrying out this Agreement, the User and NASA will bring to a United States Government installation used for STS Operations their property and employees. The property and employees of each party will be in proximity to the property and employees of each other and of other users of the Space Transportation System. To simplify the allocation of risks among NASA and all users of the Space Transportation System and to make the use of the Space Transportation System feasible for the use and exploration of outer space by all potential users, the parties agree to a no-fault, no-subrogation inter-party waiver of liability under which each party agrees to be responsible for any Damage which it sustains as a result of Damage to its own property and employees involved in STS Operations during such operations, which Damage is caused by NASA, the User or other users involved in STS Operations during such operations, whether such Damage arises through negligence or otherwise. Thus, if NASA's property, while involved in STS Operations, is damaged by the User or another user, NASA agrees to be responsible for that Damage and agrees not to bring a claim against or sue any user. Similarly, if any user's property, while involved in STS Operations, is damaged by NASA or another user, the user whose property is damaged agrees to be responsible for that Damage and agrees not to bring a claim against or sue NASA or another user. It is the intent of the parties that this inter-party

interparty waiver clause.¹⁵ NASA had also insisted that Western Union agree to a "flow down" provision in its LSA which required Western Union to extend the waiver to its "contractors and subcontractors at every tier."¹⁶

waiver of Liability be construed broadly to achieve the intended objectives.

15 The "extended" interparty waiver clause in the NASA-Western Union LSA reads as follows:

NASA and the Customer (the parties) will respectively utilize their property and employees in STS Operations in close proximity to one another and to others. Furthermore, the parties recognize that all participants in STS Operations are engaged in the common goal of meaningful exploration, exploitation and uses of outer space. In furtherance of this goal, the parties hereto agree to a no-fault, no subrogation, inter-party waiver of liability pursuant to which each party agrees not to bring a claim against or sue the other party or other customers and agrees to absorb the financial and any other consequences for Damage it incurs to its own property and employees as a result of participation in STS Operations during Protected STS Operations, irrespective of whether such Damage is caused by NASA, the Customer, or other customers participating in STS Operations, and regardless of whether such Damage arises through negligence or otherwise. Thus, the parties, by absorbing the consequences of damage to their property and employees without recourse against each other or other customers participating in STS Operations during Protected STS Operations, jointly contribute to the common goal of meaningful exploration of outer space.

16 The "flow down" provision in the NASA-Western Union LSA reads as follows:

The parties agree that this common goal [of meaningful exploration of outer space] will also be advanced through extension of the inter-party waiver of liability to other participants in STS Operations. Accordingly, the parties agree to extend the waiver as set forth in Subparagraph 3.b. above to contractors and subcontractors at every tier of the parties and other customers, as third party beneficiaries, whether or not such contractors or subcontractors causing damage bring property or employees to a United States Government Installation or retain title to or other interest in property provided by them to be used, or otherwise involved, in STS Operations. Specifically, the parties intend to protect these contractors and subcontractors from claims, including products liability claims, which might otherwise be pursued by the parties or the contractors or subcontractors of the Parties, or other customers or the contractors or subcontractors of other customers. Moreover, it is the intent of the parties that each will take all necessary and reasonable steps in accordance with Subparagraph 3.e. below to foreclose claims for Damage by any participant in STS Operations during Protected STS Operations, under the same conditions and to the same extent as set forth in Subparagraph 3.b. above, *except for claims between the Customer and its contractors or subcontractors and claims between the United States Government and its contractors and subcontractors.* (Emphasis added.)

The *Appalachian* and *Lexington* cases were consolidated for discovery purposes, but before discovery was commenced McDonnell Douglas moved for summary judgment in both cases on the ground that the interparty waiver clauses in the two LSAs barred these suits. Neither Morton Thiokol nor HITCO joined McDonnell Douglas in that motion.

The trial court granted the plaintiffs' request to take discovery concerning the origin and meaning of these interparty waiver clauses prior to a hearing on the motions. The plaintiffs took the deposition of Robert Wojtal, a senior lawyer in NASA's office of the General Counsel who had authored both versions of the interparty waiver provisions. He testified at his deposition that in the days preceding the Shuttle when satellites were launched using Delta expendable launch vehicles ("ELVs"), the LSAs used by NASA with satellite owners contained no liability waiver of any kind. NASA's only concern at that time was its requirements that a satellite owner obtain liability insurance to protect the United States from third-party claims that might result from the launch.

An ELV launched only one satellite per mission, but the Shuttle was designed to carry up to four satellites per mission, each of which could cost many millions of dollars. Furthermore, the Shuttle itself cost over one billion dollars. NASA was concerned about losing business to its competitor, Arianespace, which could happen if the cost of NASA's launch services escalated with the introduction of the Shuttle. One of the major items that could substantially increase a NASA customer's costs was the cost of satellite launch insurance. If, for example, an owner's satellite came adrift after lift-off of the Shuttle and destroyed the three other satellites on board and damaged the Shuttle, that satellite owner's insurer would face staggering liabilities, and would presumably quote equally staggering rates. This would drive customers to Arianespace, where no Shuttle was endangered and where a maximum of two satellites were on board its ELV for each mission. This idea resulted in the so-called "interparty waiver of liability" clause in NASA's LSAs.

The first such clause used by NASA was referred to by Wojtal as a "limited" waiver because it dealt only with (1) the two parties to the LSA (NASA and the "User"), (2) other "users" and (3) third parties who brought their property to the launch site at the request of NASA or the satellite owners. By December 1982, Wojtal realized that these limited waivers did not protect in any way the contractors and subcontractors of the satellite owners who were launching on the same mission. He therefore wrote an "extended" interparty waiver clause, which was used exclusively by NASA thereafter. Wojtal felt that these extended waivers, coupled with a "flow down" provision requiring the satellite owner to extend the waiver to its "contractors and subcontractors at every tier," did provide protection to contractors and subcontractors against suits brought by NASA or other satellite owners launching on the same mission. However, to insure that he did not foreclose a satellite owner's right to sue his *own* contractor or subcontractor for breach of contract, breach of warranty or negligence, Wojtal inserted the "except" clause into the flow down provision. Thus, the extended waiver foreclosed claims for damage by a

participant in Shuttle operations "except for claims between the customer and its contractors or subcontractors and claims between the United States government and its contractors and subcontractors." (Emphasis added.)

After reviewing the extrinsic evidence obtained during discovery the trial court in the *Appalachian* and *Lexington* cases found that both the limited and extended versions of NASA's interparty waiver clauses were "ambiguous;" that is, susceptible to two reasonably alternative interpretations. Under California law the intention of the parties to an ambiguous contractual term is a disputed question of fact for the court¹⁷ making disposition by summary judgment inappropriate. Accordingly, McDonnell Douglas's motions for summary judgment based on the NASA interparty waivers were denied by the Superior Court in both *Appalachian* and *Lexington*. The *Appalachian* case was decided on other grounds and although it was appealed to the California Court of Appeals, McDonnell Douglas did not raise as an issue on that appeal that the Superior Court had erred in ruling as it did on the interparty waiver in the NASA-Western Union LSA.

The *Lexington* case proceeded to a jury trial. At the end of that trial the court heard extrinsic evidence out of the hearing of the jury concerning the parties' intention as to the limited interparty waiver in the NASA-PERUMTEL LSA. The plaintiffs introduced the deposition testimony of Mr. Wojtal. McDonnell Douglas offered the testimony of George Baker, a non-lawyer who had worked at NASA. Mr. Baker testified that in his view the limited interparty waiver barred tort claims against contractors like McDonnell Douglas, but permitted breach of warranty claims against subcontractors like Morton Thiokol. At the conclusion of the trial the court ruled that the interparty waiver provision in the NASA-PERUMTEL LSA did not bar plaintiffs' negligence claims against any of the defendants, nor their breach of express warranty claim against Morton Thiokol. The trial court said:

The court finds that the LSA, the Launch Services Agreement, between PERUMTEL and NASA is silent as to the right of PERUMTEL to sue its subcontractors or contractors. So, therefore, the interparty waiver provision is not applicable to this lawsuit and, therefore, this affirmative defense would be denied.¹⁸

This ruling was never appealed by any party.

After the Challenger disaster in January 1986 President Reagan announced that, "NASA will no longer be in the business of launching

¹⁷ In federal court in California and elsewhere such a contested issue of fact is for the jury to decide if a jury trial has been demanded by one of the parties. In state court in California, however, the factual issue of the intention of the parties to an ambiguous contract is decided by the court after hearing testimony relevant to that issue out of the hearing of the jury.

¹⁸ Transcript of Record, at 5719.

private satellites."¹⁹ With the privatization of the commercial space launch industry NASA's involvement in satellite launches became limited to NASA's ELV program launches, sometimes referred to as "unlicensed" launches. NASA's present requirement for the inclusion of a "cross-waiver of liability" in NASA's LSAs concerning such launches is found in the regulations at 14 C.F.R. § 1266.104 (1993). This NASA cross-waiver of liability is used for unlicensed launches only. It is inapplicable when the cross-waiver required by the Commercial Space Launch Act²⁰ is applicable.

2. Commercial Space Launch Act Waivers

The Commercial Space Launch Act ("CSLA"), enacted in 1984 and amended in 1988, is a Congressional attempt to encourage privatization of the commercial space launch industry. It requires the licensing of all private space launch operators, and further requires each license holder²¹ to:

[E]nter into reciprocal waivers of claims with its contractors, subcontractors, and customers, and the contractors and subcontractors of such customers, involved in launch services, under which each party to each such waiver agrees to be responsible for any property damage or loss it sustains or for any personal injury to, death of, or property damage or loss sustained by its own employees resulting from activities carried out under the license.²²

This cross-waiver provision in the CSLA was raised by Martin Marietta as a defense to a counterclaim filed by the International Telecommunications Satellite Organization ("INTELSAT") in a declaratory judgment action brought by Martin Marietta following the launch failure of an INTELSAT VI satellite on March 14, 1990.²³ On that date the separation system on Martin Marietta's Titan III ELV failed to separate the second stage from the payload. INTELSAT issued commands which separated the satellite from its PKM and the satellite then went into a failed low earth orbit where it was useless as a telecommunications satellite.²⁴ When

¹⁹ Statement by the President, 22 WEEKLY COMP. PRES. DOC. 1103-04 (Aug. 15, 1986).

²⁰ Pub. L. No. 98-575, 98 Stat. 3055 (1984) (codified as amended at 49 U.S.C. App. §§ 2601 to 2623 (1990)).

²¹ At present only McDonnell Douglas Corporation, General Dynamics and Martin Marietta are license holders.

²² 49 U.S.C. § 2615(a)(1)(C).

²³ Martin Marietta Corp. v. INTELSAT, C.A. No. MJG-90-1840 (D. Md.).

²⁴ This INTELSAT VI satellite was "rescued" by NASA astronauts on May 13, 1992, after which it was boosted into geosynchronous orbit, where it is in commercial operation today.

INTELSAT demanded unlimited damages from the manufacturer for the Titan III's failure to perform, Martin Marietta filed an action for declaratory relief in federal court in Baltimore, Maryland, seeking a declaration that INTELSAT's demand for unlimited damages was barred by the cross-waiver provision in the CSLA. INTELSAT counterclaimed for compensatory damages in the amount of "at least \$400 million," alleging claims for breach of contract, negligent misrepresentation, negligence and gross negligence.

Martin Marietta filed a motion to dismiss for failure to state a claim,²⁵ arguing that section 2615(a)(1)(C) of the CSLA, the cross-waiver provision, preempted all state law tort claims brought in connection with a launch service contract and automatically created mandatory reciprocal waivers in all contracts between launch participants, even if those contracts contained no such waivers. The district court rejected that argument, noting that the statute required only that the licensee include cross-waivers in its launch services contracts.²⁶ Neither party took an appeal from that ruling.

It seems fair to conclude that the manufacturers' arguments that NASA's interparty waivers and the CSLA's cross-waiver provision insulate them from all liability for damages resulting from their malfunctioning products, have not been well received by the courts and are not likely to find favor with them in the future. That conclusion has also been reached by some commentators.²⁷

B. Strict Liability in Tort

In the *Appalachian* case the insurers sought to recover damages for the launch failure of WESTAR VI from all three of the aerospace manufacturers concerned with the defective PAM-D -- McDonnell Douglas, Morton Thiokol and HITCO -- on a strict liability in tort theory. McDonnell Douglas filed a motion for summary judgment in that case arguing that an exculpatory clause in Article 7 of the contract between Western Union and McDonnell Douglas for the purchase of the PAM-D barred such a claim. That Article said, ". . . under no circumstances will [McDonnell Douglas] be liable to Purchaser under or in connection with this agreement, under any tort, negligence, strict liability, contract or other legal or equitable theory." The two component manufacturers, Morton Thiokol and HITCO, also filed motions for summary judgment in the *Appalachian* case, arguing that Article 14 of the Western Union-McDonnell Douglas Purchase Agreement for the WESTAR VI PAM-D barred all claims against them. Article 14 had been inserted in the PAM-D purchase agreement by Western Union prior to the launch of WESTAR VI in an effort

²⁵ See Fed. R. Civ. P. 12(b)(6).

²⁶ Martin Marietta Corp. v Intelsat, 763 F. Supp. 1327, 1330 (D. Md. 1991).

²⁷ See, e.g., *Wave Goodbye to Cross-Waivers*, SPACE NEWS, Oct. 11-17, 1993, at 15.

to comply with NASA's flow down requirement in the NASA-Western Union LSA. The plaintiffs in *Appalachian* argued to the trial court that under California law, which the court had held to be applicable in the case,²⁸ strict liability in tort could not be contractually disclaimed.²⁹ The Supreme Court of California had said in 1965, "... strict liability [in tort cannot] be disclaimed, for one purpose of strict liability in tort is to prevent a manufacturer from defining the scope of his responsibility for harm caused by the product."³⁰ Nonetheless, the trial court in *Appalachian* granted the manufacturers' motions for summary judgment and the plaintiffs appealed.

On appeal the California Court of Appeal for the Fourth District upheld the trial court, finding that the doctrine of strict liability in tort did not apply in this commercial setting.³¹ The court said that the underlying purpose of the strict liability in tort doctrine was to provide a remedy for injury to consumers injured by defective products, and that when a lawsuit over a product "arises in a commercial setting and involves only a business loss, the courts hold strict liability theory is not available; the parties are limited to normal commercial remedies (e.g., the Cal. U. Com. Code or their contracts)."³² The court concluded:

Since liability for defective products when commercial entities and a business loss are involved is governed by the California Uniform Commercial Code which allows disclaimers of warranties (see Cal. U. Com. Code, § 2316) and by the parties' agreement, liability for defects

²⁸ All three manufacturers argued to the trial court that federal, not state law, was controlling on the tort issues in the *Appalachian* and *Lexington* cases because it preempted California's law of negligence and strict liability in tort. Morton Thiokol argued that even federal common law was preempted by the Outer Space Treaty, January 27, 1967, 18 U.S.T. 2410, T.I.A.S. No. 6437, 610 U.N.T.S. 205, which it claimed barred any type of tort claim arising out of accidents occurring in outer space. The trial court rejected all of these arguments, finding that California had a "strong interest in applying California tort laws" because "the manufacturer of the alleged defective product [McDonnell Douglas] resides in California," citing *Kasel v. Remington Arms*, 24 Cal. App. 3d 71. The court said there had been "an insufficient showing of pervasive reasons to invoke federal common law," citing *In re Agent Orange*, 635 F.2d 987 (2d Cir. 1980), *cert. denied*, 454 U.S. 1128 (1981), and found that the defendants had "failed to make a sufficient showing of Congressional intent to preempt tort actions involving defective products manufactured by private enterprise which arise in space." Order dated September 8, 1986, case No. 481712, O.C.S.C. None of the defendants challenged any of these rulings on appeal.

²⁹ See, e.g., *Seely v. White Motor Co.*, 63 Cal. 2d 9, 45 Cal. Rptr. 17 (1965); *Vandermark v. Ford Motor Co.*, 61 Cal. 2d 256, 37 Cal. Rptr. 896 (1964).

³⁰ *Seely v. White Motor Co.*, *supra* note 29, at 17.

³¹ *Appalachian Ins. Co. v. McDonnell Douglas Corp.*, 214 Cal. App. 3d 1, 32, 262 Cal. Rptr. 716, 735 (4th Dist. 1989).

³² *Id.* at 33.

may be disclaimed; the tort theory of strict liability does not apply and thus does not bar the disclaimer.³³

It seems likely that the Fourth District's ruling that strict liability in tort will not be available as a legal basis for recovery in commercial disputes between aerospace product users and manufacturers of malfunctioning aerospace products will be followed by other courts in the future.

C. Negligence

In both the *Appalachian* and *Lexington* cases the insurers also sought damages based on the negligence of all three manufacturers in designing, manufacturing and testing the PAM-D, including its STAR 48 SRM and new carbon-carbon involute exit cone, and in negligently failing to warn SRM users of defects in the STAR 48's exit cone. All three defendants moved for summary judgment on the ground that a negligence cause of action did not lie under California law for a loss that was purely "economic" where the product had caused injury only to itself. The plaintiffs argued to the trial court that California law permitted negligence claims in these circumstances.³⁴

The courts are divided on the issue of whether damages can be recovered on a negligence theory where the only injury suffered is to the product itself. The leading case holding that recovery is not available in such circumstances is the United States Supreme Court's admiralty decision in *East River S.S. Corp. v. Transamerica Delaval, Inc.*³⁵ In that case the charterers of supertankers sued the manufacturer of the ships' turbines in negligence to recover damages to repair the ships and for lost income while the ships were out of service after the turbines malfunctioned. The Supreme Court held that there was no recovery in negligence for the damages sought. It said:

Even when the harm to the product itself occurs through an abrupt, accident-like event, the resulting loss due to repair costs, decreased value, and lost profits is essentially the failure of the purchaser to receive the benefit of its bargain -- traditionally the core concern of contract law.

[W]e . . . hold that a manufacturer [of maritime products] in a commercial relationship has no duty under either a negligence or strict products-liability theory to prevent a

33 *Id.*

34 *See, e.g., Ales-Peratis Foods, Int'l, Inc. v. American Can Co.*, 164 Cal. App. 3d 277, 209 Cal. Rptr. 917 (1985).

35 476 U.S. 858 (1986).

product from injuring itself. . . . When a product injures only itself the reasons for imposing a tort duty are weak and those for leaving the party to its contractual remedies are strong.³⁶

The trial court in the *Appalachian* and *Lexington* cases concluded that California did recognize a cause of action for negligence where the only loss was economic, and denied the defendants' motions to dismiss plaintiffs' negligence claims. On appeal in the *Appalachian* case the Fourth District Court of Appeals never reached this issue.³⁷ The *Lexington* case proceeded to a jury trial on the issue of negligence. At the close of the evidence the jury deliberated for six days, finally voting ten to two that the defendants were not guilty of negligence. Two jurors found the manufacturers of the PAM-D guilty of negligence.³⁸

In the *INTELSAT* case Martin Marietta moved to dismiss INTELSAT's negligence claim on the ground that it failed to state a claim upon which relief could be granted. The district court granted Martin Marietta's motion, holding as a matter of law that Martin Marietta owed no duty of care to INTELSAT under the circumstances.³⁹ The trial court said:

Equally sophisticated parties who have the opportunity to allocate risks to third party insurance or among one another should be held to only those duties specified by the agreed upon contractual terms and not to general tort duties imposed by state law.

The case before the Court does not present circumstances in which the law creates a tort duty of care independent from the parties' contractual relationship. Such tort duties of care with respect to representations are imposed by courts to protect a peculiarly vulnerable party. . . . No such relationship of special trust exists here.⁴⁰

On appeal to the United States Court of Appeals for the Fourth Circuit this ruling was affirmed and the above-quoted language cited with approval by the court of appeals.⁴¹

The subject of recovery in negligence for economic loss where the product injures only itself is still an open one, but it would seem prudent for purchasers of malfunctioning aerospace products to expect some courts

³⁶ *Id.* at 870, 871 (1986).

³⁷ *Appalachian Ins. Co. v. McDonnell Douglas Corp.*, *supra*, note 31, at 36.

³⁸ Under California law a unanimous verdict is not required in a civil case.

³⁹ *Martin Marietta Corp. v. INTELSAT*, 763 F. Supp. 1327, 1332-33 (D. Md. 1991).

⁴⁰ *Id.*

⁴¹ *Martin Marietta v. INTELSAT*, 991 F.2d 94, 98 (4th Cir. 1993).

faced with this issue in the future to follow the reasoning of the United States Supreme Court in *East River Steamship*.

D. Gross Negligence

In addition to a claim of negligence, INTELSAT alleged in its counterclaim that Martin Marietta was guilty of gross negligence and sought to recover damages based on that theory. Shortly after the failure of its Titan III launch vehicle Martin Marietta had admitted in press releases that the failure of the launch vehicle to separate from its payload was the result of miswiring by its technicians, errors by its software and computer engineers and the lack of coordination between these groups.

Martin Marietta moved to dismiss INTELSAT's gross negligence claim on the ground that it was barred by the cross-waiver provision in the contract between INTELSAT and Martin Marietta for the launch of INTELSAT VI, a provision inserted because of the CSLA. INTELSAT argued to the trial court that under Maryland law, which the parties had agreed would govern, public policy invalidated such waivers as they applied to claims of gross negligence. The trial court found that the legislative history of the 1988 Amendments to the CSLA indicated, "that Congress intended the mandatory waivers to bar recovery in all instances, including cases where parties were grossly negligent."⁴² The court said, "[t]he public policy of this country, as stated by Congress, requires that those using the service of a licensed space launch provider do so at their own risk."⁴³ The trial court continued:

As mankind ventures forth from the home planet, great hazards, known and as yet unknown, will confront us. Now, and perhaps for as long as the human race seeks to go where it has not gone before, there shall be missions which cannot be "safe" as that term is used in the context of terrestrial activities. Those who seek to explore, and to exploit, outer space must do so charged with acceptance of the unknown, and perhaps unknowable, perils to be faced in that vast and potentially hostile environment.⁴⁴

The Court of Appeals disagreed. It found that Maryland law invalidated contractual waivers of liability in cases of gross negligence, even where the parties were of equal bargaining power. It also found that INTELSAT had "sufficiently alleged gross negligence so as to survive a 12(b)(6) motion."⁴⁵ Furthermore, the Fourth Circuit found "absolutely no support" in the legislative history of the 1988 Amendments to the CSLA for

⁴² Martin Marietta corp. v. INTELSAT, 763 F. Supp. at 1333.

⁴³ *Id.* at 1334.

⁴⁴ *Id.*

⁴⁵ Martin Marietta Corp. v. INTELSAT, 991 F.2d at 100.

the trial court's conclusion that that statute overrode Maryland law.⁴⁶ The Court said, ". . . neither the language of the Amendments nor their legislative history reflects a Congressional intent to protect parties from liability for their own gross negligence."⁴⁷

In reinstating INTELSAT's gross negligence claim the Fourth Circuit did little to promote clarity of thought in this area. Most courts consider that gross negligence falls short of a reckless disregard of the consequences and differs from ordinary negligence only in degree, and not in kind.⁴⁸ As Dean Prosser has put it:

The prevailing rule in most situations is that there are no "degrees" of care or negligence, as a matter of law; there are only different amounts of care, as a matter of fact. From this perspective, "gross" negligence is merely the same thing as ordinary negligence, "with the addition," as Baron Rolfe once put it, "of a vituperative epithet."⁴⁹

If gross negligence differs from ordinary negligence only in degree and not in kind; and if a *prima facie* case of ordinary negligence requires "[a] duty, . . . recognized by the law, requiring the person to conform to a certain standard of conduct, for the protection of others against unreasonable risks;"⁵⁰ it is difficult to see how the Fourth Circuit could conclude that INTELSAT had alleged a sufficient claim of gross negligence after affirming the trial court's dismissal of INTELSAT's ordinary negligence claim on the ground that Martin Marietta owed INTELSAT no tort duty of care. In any event, the Fourth Circuit's reversal of the trial court's construction of the CSLA seems sound, and aerospace manufacturers should not expect to prevail in the future when arguing that the CSLA reflects a Congressional intent to protect them from liability for their own gross negligence.

E. Negligent Misrepresentation

In 1981 Hughes Aircraft Co. manufactured and sold to Western Union two HS 376 model telecommunications satellites which, in their "long life option" forms, were supposed to have mission lives of ten years between beginning of life ("BOL")⁵¹ and end of life ("EOL").⁵² Western

⁴⁶ *Id.*

⁴⁷ *Id.*

⁴⁸ See generally, PROSSER & KEETON, *supra*, note 2, § 34, at 208-14.

⁴⁹ *Id.* at 211.

⁵⁰ *Id.* at 164.

⁵¹ The beginning of life of a satellite occurs when it is ready to begin commercial service, having arrived "on station" at its assigned location on the

Union launched both satellites in 1982 and they were successfully placed in geosynchronous orbit. Later, Western Union sold some of the twenty-four transponders on board each of the satellites to third parties, while retaining title to the satellites. Public Broadcasting Service ("PBS") purchased four of these "condominium" transponders on board WESTAR IV from Western Union in 1984. In its transponder sales agreement with PBS Western Union warranted that the four transponders each had ten year mission lives, making WESTAR IV's predicted EOL April 5, 1992, ten years after its BOL on April 5, 1982.

In April 1987 Western Union sent letters to its transponder purchasers, including PBS, advising them that its fuel usage calculations showed that both WESTAR IV and V were beginning to use more hydrazine fuel for stationkeeping purposes than was originally budgeted by HUGHES, and that Western Union was now predicting that the EOLs of these satellites would occur approximately nine months earlier than had been previously predicted. Hughes reviewed its fuel usage calculations for those satellites, its telemetry software and fuel thruster efficiency data, and subsequently agreed with Western Union that both WESTAR IV and WESTAR V would run out of hydrazine fuel before the end of their ten year mission lives. Thus advised, PBS purchased additional transponders to cover the shortfall period for its programming. It then sent a letter to Western Union and HUGHES demanding that they jointly pay PBS the sum of \$9 million as damages caused by the early EOL of WESTAR IV.

Western Union settled PBS's claim short of litigation, but HUGHES refused to pay PBS. In February 1990 PBS filed suit against Hughes in federal court in Los Angeles seeking damages in the amount of the costs PBS incurred to replace the fifteen months of lost transponder service.⁵³ In its complaint PBS alleged a claim of negligent misrepresentation, charging that HUGHES had represented in its promotional and advertising materials, which Western Union had used when selling its transponders to PBS, that WESTAR IV had a minimum design, mission and operational life of ten years. PBS alleged that HUGHES knew or should have known that Western Union would use HUGHES's promotional literature when selling transponders to third parties like PBS; that HUGHES lacked reasonable grounds for believing that its representations as to the operational life of WESTAR IV were true; that it was foreseeable that PBS would rely upon Hughes's representations in making its decision to purchase transponders; and that PBS had, in fact, relied on HUGHES's representations in deciding to purchase the transponders. After months of discovery HUGHES filed a

geosynchronous orbit and having successfully completed its tests and system checks.

⁵² In 1981 the end of life of a satellite occurred when it ran out of hydrazine fuel, the liquid fuel carried on board the satellite and used during its mission life to fire the thrusters in the satellite's reaction control system ("RCS") to correct the drift of the satellite and keep it "on station."

⁵³ Public Broadcasting Serv. v. Hughes Aircraft Co., C.A. No. 90-0736 WDK (Bx) (C.D. Cal.).

motion for summary judgment. The trial court denied the motion and set the case for jury trial. The case was settled prior to trial and the terms of the settlement were not made public.⁵⁴

INTELSAT also had a claim based on negligent misrepresentation in its counterclaim against Martin Marietta. Martin Marietta filed a motion to dismiss that count for failure to state a claim, arguing that a disclaimer clause in Article 17 of its contract with INTELSAT for launch services barred such a claim. INTELSAT argued to the trial court that this disclaimer clause did not apply to negligent misrepresentations made by Martin Marietta to INTELSAT after execution of the launch services agreement but before the launch of Martin Marietta's Titan III. The trial court agreed with INTELSAT that Martin Marietta was not entitled to a dismissal of the negligent misrepresentation claim based upon the disclaimer clause in Article 17.⁵⁵ However, the trial court granted the motion for the same reason it dismissed INTELSAT's claim of ordinary negligence -- that Martin Marietta owed no tort duty of care to INTELSAT in these circumstances.⁵⁶

On appeal the Fourth Circuit affirmed the trial court's dismissal of INTELSAT's negligent misrepresentation claim on the ground that Martin Marietta owed no duty of care to INTELSAT.⁵⁷ However, it found that Maryland law did not support INTELSAT's theory that post-contract misrepresentations invalidate contractual limitations on remedies.⁵⁸

F. Breach of Warranty

In contracting with McDonnell Douglas for the development and production of STAR 48 SRMs to be used with McDonnell Douglas's PAMs, seller Morton Thiokol expressly warranted to buyer McDonnell Douglas the performance of its SRMs, including their burn time and the ability of their carbon-carbon exit cones to withstand all thermal and mechanical stresses from ignition to ignition plus 200 seconds. The McDonnell Douglas-Morton

⁵⁴ In 1989 Western Union made claims against its in-orbit satellite insurers alleging that both WESTAR IV and WESTAR V had suffered "Insufficient Fuel" as defined in a policy of satellite life insurance having a policy period of three years from October 1, 1981 to October 1, 1984. A group of insurers headed by the Lexington Insurance Company ("the LEXINGTON Group") denied coverage and were sued by Western Union in federal court in New Jersey in 1991. *Western Union Corp. v. Lexington Ins. Co., et al.*, C.A. No. 91-193 (JWB) (D.N.J.). Later, other insurers denied coverage and were joined as defendants in that action. The LEXINGTON Group recently settled its disputes with Western Union (now renamed New Valley Corp.) but the action remains pending as to Western Union's other insurers.

⁵⁵ *Martin Marietta Corp. v. INTELSAT*, 763 F. Supp. at 1332.

⁵⁶ *Id.* at 1333.

⁵⁷ *Martin Marietta Corp. v. INTELSAT*, 991 F.2d at 98.

⁵⁸ *Id.* at 99.

Thiokol contract for STAR 48s stated, "All warranties shall run to MDC, its successors and assigns, and to its customers and the users of its products" (emphasis added).

Plaintiffs in the *Appalachian* case, after discovering this warranty, sought to amend their complaint to add a cause of action against Morton Thiokol for breach of an express warranty, alleging that Western Union was a third-party beneficiary of this warranty and that plaintiffs were Western Union's subrogees. The trial court refused to permit plaintiffs to amend their complaint and, after summary judgment was entered in favor of the defendants in *Appalachian* on the basis of the exculpatory clauses and disclaimers in the Western Union-McDonnell Douglas Purchase Agreement for the PAM-D, the insurers appealed this ruling.

The California Court of Appeal for the Fourth District affirmed the trial court's denial of plaintiffs' motion to add a claim for breach of express warranty.⁵⁹ The court noted that there was no evidence that Western Union was aware of the warranty in the STAR 48 contract given by Morton Thiokol to McDonnell Douglas and to "the users of its products" at the time Western Union negotiated its contract for the purchase of a PAM-D from McDonnell Douglas. It reasoned that since *Appalachian* had failed "to show the warranty from Morton Thiokol ever formed a 'part of the basis of the bargain'",⁶⁰ there was "no basis for limiting or negating the exculpatory clauses and disclaimers in Western Union's written agreement with McDonnell Douglas."⁶¹

The Fourth District's analysis in *Appalachian* of plaintiffs' breach of warranty claim is extremely suspect in light of California law concerning third-party beneficiaries. Under California law the warranty given by Morton Thiokol to McDonnell Douglas in the STAR 48 contract expressly made Western Union and other STAR 48 users third-party beneficiaries of that contract.⁶² The McDonnell Douglas-Morton Thiokol Star 48 contract created rights in the third-party beneficiary (Western Union) just as it created rights in the two parties to the contract -- the promisor (Morton Thiokol) and the promisee (McDonnell Douglas). Under California law it is not necessary that the beneficiary be identified, for a third party may enforce a contract where he shows that he is a member of a class of persons for whose benefit it was made,⁶³ and he may enforce it at any time before the parties to the contract rescind it.⁶⁴ California cases have long held that a third-party beneficiary of a promise need not be

59 *Appalachian Ins. Co. v. McDonnell Douglas Corp.*, *supra* note 31, at 737.

60 *Id.* at 737.

61 *Id.*

62 See Cal. Civ. Code § 1559.

63 See *Garratt v. Baker*, 5 Cal. 2d 745, 748 (1936).

64 Cal. Civ. Code § 1559.

aware of it, or act in reliance upon it, in order to enforce it later.⁶⁵ The promisor is held to his promise because he knew when making the promise that the promisee intended that a benefit be extended to the third party. If an express warranty was given to Western Union as a third-party beneficiary of the McDonnell Douglas-Morton Thiokol STAR 48 contract, the disclaimers in the McDonnell Douglas-Western Union PAM-D contract would be ineffective to bar express warranty claims because of the rule that express warranties take precedence over attempted disclaimers.⁶⁶

In view of this undisputed body of California law it is difficult to understand the reasoning of the Fourth District that Western Union had no claim for breach of express warranty because *Appalachian* failed to show that the warranty from Morton Thiokol ever formed a part of the basis of the bargain between Western Union and McDonnell Douglas for the purchase of a PAM-D. The requirement of the Uniform Commercial Code that to create an express warranty there must be an "affirmation of fact or promise made by the seller to the buyer which relates to the goods and becomes part of the basis of the bargain"⁶⁷ was met because Morton Thiokol's express warranty was a part of the basis of the bargain between McDonnell Douglas and Morton Thiokol for the sale of STAR 48 SRMs.

Because of the flawed analysis of the Fourth District in *Appalachian* concerning breach of warranty, it seems fair to conclude that aerospace manufacturers would not be justified in relying heavily that this ruling will be followed by other courts when dealing with similar breach of express warranty claims. It is interesting to note that, following the *Appalachian* and *Lexington* cases, McDonnell Douglas sued Morton Thiokol in federal court in Los Angeles⁶⁸ seeking incidental and consequential damages in the amount of \$17,243,000⁶⁹ for breach of this same express warranty given by Morton Thiokol to McDonnell Douglas in the STAR 48 contract.

G. Contract

Article 2 of the contract between INTELSAT and Martin Marietta contained a clause stating that Martin Marietta promised "to make its Best Efforts to furnish Launch Services for the purpose of delivering

⁶⁵ See, e.g., *Johnson v. Holmes Tuttle Lincoln-Mercury*, 160 Cal. App. 2d 290, 297 (2d Dist. 1958); *Pitzer v. Wedel*, 73 Cal. App. 2d 86 (4th Dist. 1948); RESTATEMENT (SECOND) OF CONTRACTS § 306, Comment (a).

⁶⁶ This rule is codified in California in Cal. U. Com. Code § 2316.

⁶⁷ Cal. U. Com. Code § 2313(1).

⁶⁸ *McDonnell Douglas Corp. v. Thiokol Corp. and Morton Int'l Inc.*, C.A. No. 92-4008 WJR (GHK) (C.D. Cal.).

⁶⁹ These damages include the costs incurred by McDonnell Douglas to investigate the cause of the failures of the WESTAR VI and PALAPA B-2 exit cones, and the "redesign" and retrofit costs incurred. In actual fact, following this double failure McDonnell Douglas returned to using its old, heavier but reliable tape-wrapped carbon phenolic exit cones on the Star 48 SRM.

INTELSAT's payload into orbit." The contract defined "Best Efforts" as "diligently working in a good and workman-like manner as a reasonable, prudent manufacturer of launch vehicles and provider of Launch Services."⁷⁰ In its counterclaim INTELSAT alleged that Martin Marietta had breached this provision in the contract. Martin Marietta moved to dismiss the breach of contract claim on the ground that it was barred by Article 6.7 of the contract. That article provided that a replacement launch "shall be the sole and exclusive remedy of the Buyer from Martin Marietta in the event the Titan III mission fails for any reason." Martin Marietta also argued that the Limitation of Liability section contained in Article 17 of the contract, entitled "Allocation of Certain Risks," barred INTELSAT's breach of contract claim. In that article the parties agreed that, "notwithstanding any other provision of this contract," the risks arising out of the launch would be allocated between INTELSAT and Martin Marietta as set forth in Article 17. In Article 17.6, entitled "Limitation of Liability," the parties agreed that Martin Marietta's liability to INTELSAT "whether or not arising under contract, . . . shall not include any loss of use or loss of profit or revenue or any other indirect, special, incidental or consequential damages."

The trial court granted Martin Marietta's motion, holding that INTELSAT's breach of contract claim was clearly and unambiguously barred by Article 6.7 (replacement launch as sole remedy for a mission failure), and by Article 17.6 (Limitation of Liability).⁷¹

On appeal the Fourth Circuit disagreed. It found that the interplay of these two provisions was ambiguous, thus creating a contested issue of fact for the jury as to the intention of the parties concerning remedies for breach of contract.⁷² The court said:

INTELSAT claims that the contract is ambiguous because Article 6.7 states that a replacement launch is INTELSAT's "sole and exclusive" remedy, while the Article 17 "Limitation of Liability" provision puts a damages cap on claims "arising under contract, or in negligence, strict liability, or under any other theory of tort or liability." INTELSAT argues that an Article 6 replacement launch could not be an exclusive remedy when Article 17 recognizes the possibility of other claims, especially when Article 17 stated that it would govern the allocation of risks between the parties "notwithstanding any other provisions of this Contract." At the very least, INTELSAT contends the two articles together create an ambiguity precluding dismissal.

⁷⁰ Article 1.2 INTELSAT-Martin Marietta contract.

⁷¹ Martin Marietta Corp. v. INTELSAT, 991 F.2d 94, 97 (4th Cir. 1993).

⁷² *Id.* at 98.

... [T]he contract is far from crystal clear and never refers to "pre-launch" or "post-launch" damages or otherwise mandates Martin Marietta's interpretation.

In light of these ambiguities, it does not appear beyond doubt that INTELSAT can prove no set of facts constituting breach of Martin Marietta's contractual duty to use its "Best Efforts," and we must therefore reverse the district court's dismissal of INTELSAT's breach of contract claim. [Citations omitted].⁷³

Language such as "the contract is far from crystal clear," and "it does not appear beyond doubt," is unusual in a contract case. However, it seems beyond doubt that the Fourth Circuit was not impressed with Martin Marietta's promise to use its "Best Efforts" in performing the contract, coupled with its argument that it had no liability for breach of contract when it failed to perform in accordance with the contract definition of that phrase, a fact the court had to assume on a motion to dismiss for failure to state a claim. In any event, the *INTELSAT* case has now been settled and it has been reported that the terms of the proposed settlement include the purchase by INTELSAT of additional INTELSAT 8 satellites from Martin Marietta "under an existing contract but with revised conditions."⁷⁴

CONCLUSION

Like MacPherson's decision to file suit against the Buick Motor Company in 1915 in the face of a rule of law hostile to purchasers and users of defective products, some purchasers and users of non-performing aerospace products (and their subrogees) decided to bring claims against the manufacturers of those products in the last eight years. A review of these cases shows that, while the courts have adopted a generally protective attitude towards the aerospace manufacturers, they have not accepted all of the manufacturers' arguments by any means, particularly those that have been overreaching in their attempt to insulate the manufacturers from liability.

In those eight years there have been many momentous changes in the global economy, the world political situation, the views of the public towards expensive and sometimes ineffective space projects and in the attitudes of the purchasers, operators and users of malfunctioning aerospace products towards the manufacturers of those products.

After watching the Shuttle Challenger explode on national television on January 28, 1986 with seven astronauts on board, the nation has never viewed aerospace products and space endeavors in the same way that it did before that date. The report of the Presidential Commission

⁷³ *Id.* at 97, 98.

⁷⁴ See *Martin, Intelsat Agree to Settle Launch Suit*, SPACE NEWS, June 14-20, 1993, at 2.

established by President Reagan to investigate the cause of the Challenger accident, commonly known as "the Rogers Commission," did nothing to enhance the reputation of either NASA or aerospace manufacturers.⁷⁵

For unmanned launches of commercial and government satellites during the last eight years the failure rate has remained constant at about fifteen percent.⁷⁶ Purchasers and users of satellites and launch services are beginning to show a growing lack of tolerance over this statistic.⁷⁷ Failures of aerospace products and launch vehicles during the last two years have received extensive news coverage. For example, General

⁷⁵ The Rogers Commission reported in its findings:

The genesis of the Challenger accident -- the failure of the joint of the right Solid Rocket Motor -- began with decisions made in the design of the joint and in the failure by both Thiokol and NASA's Solid Rocket Booster project office to understand and respond to facts obtained during testing.

The Commission has concluded that neither Thiokol nor NASA responded adequately to internal warnings about the faulty seal design. Furthermore, Thiokol and NASA did not make a timely attempt to develop and verify a new seal after the initial design was shown to be deficient. Neither organization developed a solution to the unexpected occurrences of O-ring erosion and blow-by even though this problem was experienced frequently during the Shuttle flight history. Instead, Thiokol and NASA management came to accept erosion and blow-by as unavoidable and an acceptable flight risk.

Report to the President by the Presidential Commission on the Space Shuttle Challenger Accident, June 6, 1986, at 148.

⁷⁶ At an International Space Conference given by the Italian insurance company GENERALI in Rome, Italy on March 11-12, 1993 (hereafter "1993 GENERALI Conference"), David T. Tudge, Vice President and Chief Financial Officer of INTELSAT, reported to conference attendees:

The risk of failure in bringing new satellites into operation is statistically reasonably constant over the large number of occurrences: one failure in seven being a reasonable approximation. Intelsat's own experience bears this out: with two failures out of 15 Intelsat V/VAS launched and one almost lost Intelsat VI out of the five ordered.

Commercial and Industrial Activities in Space, Insurance Implications, GENERALI Conference, March 11-12, 1993, at 115 (hereafter "1993 GENERALI Report").

⁷⁷ In his remarks to the conferees at the 1993 GENERALI Conference Frederick M. Bartlett, Vice President, Finance and Administration and Treasurer, TELESAT Canada, said:

At the last GENERALI conference in September 1991, ... I concluded that we, the operators, ... should be more demanding of satellite manufacturers and launching agencies.

Let's face it, the quality control procedures we have in place within our industry are not producing acceptable results. In my view, a 80-85% success rate is just not good enough. We need better, much better. ... I am somewhat embarrassed to be associated with an industry that produces a 17-20% failure rate.

1993 GENERALI Report, at 70.

Dynamics has experienced three failures of its Atlas 2 launch vehicles out of nine flights between April 18, 1991 and March 25, 1993, two of them back-to-back.⁷⁸ Martin Marietta experienced the failure of one of its Titan 4 launch vehicles and the loss of three of the satellites manufactured by its newly-acquired Astro Space division within two months in late 1993.⁷⁹ Furthermore, defense contractors like McDonnell Douglas, which once held a NASA-granted monopoly on the only upper-stage booster that could be used with commercial satellites launched from the Shuttle,⁸⁰ no longer enjoy the bargaining power they once wielded.⁸¹ With the end of the Cold War, the breakup of the Soviet Union, Russia's efforts to become a market economy and the entry of the Russians, Chinese and Japanese into the field of launch vehicle services, keen competition is forcing aerospace manufacturers to pay more attention to the reliability of their products.⁸²

Based on these and other factors the forecast here is that there will be in the future a slow but steady reallocation of the risk of loss from malfunctioning aerospace products away from the purchaser and user of those products and towards the manufacturers of them. It is predicted that MacPherson's Buick will slowly but steadily sputter forward into the next century.

⁷⁸ See *Atlas Rocket Resumes Launches, Deploys DoD Satellite*, SPACE NEWS, July 26-Aug. 1, 1993, at 9.

⁷⁹ See *Fixing Rockets and Reputations*, WASHINGTON POST, Oct. 26, 1993, at C1.

⁸⁰ See *Appalachian Ins. Co., v. McDonnell Douglas Corp.*, *supra* note 31, at 728, 729.

⁸¹ See *McDonnell Douglas Assaulted on All Sides*, WASHINGTON POST, April 25, 1993, at H1.

⁸² See *GD Works to Repair Atlas' Image*, SPACE NEWS, May 31-June 6, 1993, at 4.

THE ROLE OF ESA IN THE EVOLUTION OF SPACE LAW

Gabriel Lafferranderie*
&
Paul Henry Tuinder**

The European Space Agency (ESA) is a regional international intergovernmental organization whose mandate is to conduct space research and development for exclusively peaceful purposes.¹ The Agency has currently thirteen European Member States,² plus a special cooperative relationship with Canada providing for Canada's participation in several ESA programmes.³ In 1995 Finland, an Associate State since 1987, will become the fourteenth ESA Member State (the Accession Agreement was signed on 22 March 1994). ESA is a unique organization as it is the only international organization in the world dedicated to the research and development of space activities (since the dissolution of INTERCOSMOS). ESA has legal personality⁴ and is therefore subject to international law, especially its space law provisions. ESA accepted by declaration the Rescue Agreement,⁵ the Registration Convention⁶ and the Liability Convention,⁷ and has rights and obligations under these treaties

* Legal Adviser, European Space Agency. This author, who is a staff member of the European Space Agency, writes in a personal capacity. His views do not bind the European Space Agency.

** Consultant with HT&W Paris, a consulting firm specialized in space and telecommunications issues.

¹ Art. II of the ESA Convention, in 2 SPACE LAW - BASIC LEGAL DOCUMENTS, C. I. (K.-H. Böckstiegel & M. Benkö eds. Nijhoff 1992).

² Austria, Belgium, Denmark, France, Germany, Ireland, Italy, Netherlands, Norway, Spain, Sweden, Switzerland, United Kingdom.

³ See Cooperation Agreement between the Government of Canada and the European Space Agency, signed 31 May 1989, Doc. ESA/LEG 117. See on the relations between ESA and Canada: M. Bourély, *Le Canada et l'Agence Spatiale Européenne*, 4 ANN. AIR & SPACE L. 397 (1979); M. Bourély, *La participation du Canada aux programmes de l'Agence Spatiale Européenne*, 5 ANN. AIR & SPACE L. 363 (1980); G. Lafferranderie, *L'affermissement des relations entre le Canada et l'Agence Spatiale Européenne*, 14 ANN. AIR & SPACE L. 369. (1989); G. Lafferranderie, *The Enlargement of the European Space Agency - Legal Issues*, 15 J. SPACE L. 119 (1987).

⁴ Art. XV of the ESA Convention, in SPACE LAW - BASIC LEGAL DOCUMENTS, *supra* note 1.

⁵ Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 22 April 1968 (hereinafter Rescue Agreement), TIAS 6599, 19 UST 7570.

⁶ Convention on Registration of Objects Launched into Outer Space, 14 January 1975 (hereinafter Registration Convention), TIAS 8480, 28 UST 695.

⁷ Convention on International Liability for Damage Caused by Space Objects, 29 March 1972 (hereinafter Liability Convention), TIAS 7762, 24 UST 2389.

independently from the Member States. ESA was associated, through its internal policy-making process, with the European contributions for adopting the United Nations Principles on remote sensing and nuclear power sources.

It is the purpose of this article to describe what kind of legal problems are encountered by ESA when it carries out its activities and what role ESA plays in the further development of space law. Two features of ESA play an important role. ESA is an international cooperative venture striving to honor the principles of the Outer Space Treaty,⁸ which provides for international cooperation in the conduct of space activities.⁹ However, in the same Article, it is provided that any practical problems should be solved by the States Party to the Outer Space Treaty. This situation raises questions with regard to competing national jurisdictions (of the Member States), liability and responsibility allocations.

In addition, the activities of ESA unavoidably lead to the creation of additional rules of space law or to the practical implementation of the general principles of space law. Further, the creation of new space activities resulting from its R&D efforts inevitably gives ESA a special character, as law follows technical developments and ESA is by definition in the forefront of developments and applications.¹⁰

Finally, ESA is also involved in programmes of application, and the maturity of these activities reflects the need for more practical down-to-earth rules and solutions whereby space law principles acquire a more empowering role.

That ESA has a specific role in the evolution of space law will be clear from the above. For the future however, given the number of important projects (most of them involving international cooperation) to be implemented, such as the international Space Station, it will be of interest to see which direction ESA will take as an international organization and what influences will be exerted upon space law as a result.

ESA AND SPACE LAW

ESA succeeded ESRO (European Space Research Organisation) and ELDO (European Launcher Development Organisation) and started to carry out its activities, de facto, in 1975.¹¹ The ESA Convention came into force

⁸ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, 27 January 1967 (hereinafter Outer Space Treaty), TIAS 6347, 18 UST 2410.

⁹ See article XIII of the Outer Space Treaty which provides that: "The provisions of this Treaty shall apply to the activities of States Parties to the Treaty in the exploration and use of outer space, including the moon and other celestial bodies, whether such activities are carried on by a single State party to the Treaty or jointly with other States, including cases where they are carried on within the framework of international inter-governmental organizations..."

¹⁰ For a similar argument, see M. Bourély, *L'Agence Spatiale et le Droit de l'Espace*, ESA Bull. 39 (No. 13, 13 May 1978).

¹¹ After its approval by the European Space Conference (ESC) on 15 April 1975, the ESA Convention was opened for signature at the Plenipotentiary Conference on 30 May 1975. This concluded the discussions of the ESC which

in 1980. ESA has a twofold structure, part of its activities being mandatory, mainly the science programme, and funded in accordance with the Member States GNP percentages, and part of the programmes (application oriented) being optional where the Member States have the option not to participate. Currently, ESA is executing optional programmes in the following areas: Earth Observation, Telecommunications, (Manned) Space Transportation and Micro-gravity. The optional programmes¹² are the most interesting from the point of view of space law as they raise all kinds of questions regarding the implementation of the general principles of space law. The Council has entrusted the International Relations Advisory Group, renamed Committee and today, the International Relations Committee (IRC), as an advisory body for the formulation of ESA's position, and coordination between the Member States, vis-a-vis the UNCOPUOS. The main role of the IRC is to advise Council on external relations policy, conclusion of agreements with non-Member States, etc. IRC also functions as a forum for exchanging views on UN developments.

Standard Article on Declaration of Acceptance by International Organizations

ESA's role in the development of space law goes back to the formulation of the basic principles of space law. The first example of such formulation may be found in the work of the European Space Conference Working Group in charge of the United Nations. This group was at the origin of the drafting and adoption of article VI of the Outer Space Treaty, which was later implemented in the other space treaties, and which provides for the declaration of acceptance of these treaties by international organizations.¹³

started on 20 December 1972, where the Ministers adopted the concept of a European Space Agency which should continue the activities of ESRO and ELDO. ESRO conducted its activities under the name of ESA and used when possible the provisions of the ESA Convention. See M. Bourély, *Les traits saillants de la Convention portant création d'une Agence Spatiale Européenne*, ESA Bull. (1 June 1975), reprinted in EUROPEAN CENTRE FOR SPACE LAW (ECSL), SPACE LAW AND POLICY SUMMER COURSE - BASIC MATERIALS (Nijhoff 1993); M. Bourély, *La naissance de l'Agence Spatiale Européenne*, 29 REVUE FRANÇAISE DE DROIT AÉRIEN ET SPATIAL 259 (1975); M. Bourély, *L'Agence Spatiale Européenne*, 1 ANN. AIR & SPACE L. 183-196 (1976); M. Bourély & G. Lafferranderie, *Les organisations de l'espace*, Jurisclasseur Droit International, Fasc 195; J. Chappez, *La création de l'Agence Spatiale Européenne*, ANNUAIRE FRANÇAIS DE DROIT INTERNATIONAL 801 (1975); H. Kaltenecker, *La nouvelle Agence Spatiale Européenne*, 17 PROC. COLLOQ. L. OUTER SPACE 126-137 (1974); H. Kaltenecker, *The European Space Agency in 1 MANUAL ON SPACE LAW* 259 (N. Jasentuliyana ed., Oceana 1979); R. F. von Preuschen, *The European Space Agency*, 27 INT'L & COMP. L. Q. 46-60 (Jan. 1978).

¹² On optional programmes: G. Lafferranderie, *Considérations sur la procédure d'engagement des programmes facultatifs*, ESA Bull. 53 (No.51, 1987); G. Lafferranderie, *Les Programmes Facultatifs*; Proceedings of the International Colloquium on "The Implementation of the ESA Convention - Lessons from the Past," held on October 23 and 26, 1993 in Florence, Italy (Nijhoff, 1994).

¹³ See art. XXII of the Liability Convention, art. VII of the Registration Convention, art. 16 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies - adopted by the U.N. Gen. Assembly on December 5, 1979, opened for signature on Dec. 18, 1979, entered into force July 11, 1984 U.N. Doc. A/RES/34/68 (1979) [hereinafter Moon Agreement].

Observer Status in UNCOPUOS

The forerunner of ESA, ESRO, was granted an observer status in the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) in 1973.¹⁴ Since then, ESA has participated actively in the discussions at the UNCOPUOS and functioned as a forum for coordinating the Member States positions via its International Relations Committee.

ESA and the Space Treaties

The Outer Space Treaty is only open to signature by States. However, Article 6 of this treaty provides that its provisions should be respected by international organizations. The four other space treaties concluded after the Outer Space Treaty also contain provisions for intergovernmental organizations. For example, the Rescue Agreement explicitly provides for an Intergovernmental Organization's being considered as a "launching authority." To obtain such recognition, it is required that the majority of the Member States of that organization be States Parties to the Rescue Agreement and to the Outer Space Treaty and that the intergovernmental organization declare its acceptance of the rights and obligations provided for in the Rescue Agreement.¹⁵ A similar provision can be found in the Liability Convention.¹⁶ Notably, States Parties to these Treaties have an obligation to ensure that the intergovernmental organization of which they are a Member will deposit such a declaration.¹⁷ ESA¹⁸ has submitted its declaration of acceptance of both treaties to the United Nations Secretary General and the Depository Governments.¹⁹ The same procedure was followed with regard to the Registration Convention,²⁰ where Article VII provides for application of the provisions to intergovernmental organizations. The Moon Agreement has a similar provision in Article 16, but has not yet been ratified by the majority of ESA Member States.

For many years, ESA was the only international organization to have accepted the space treaties, thereby demonstrating its intent to

¹⁴ See ESRO General Report of 1973. As an example, the Secretariats of ESRO and ELDO produced a legal analysis based on the "functional approach" on the definition/delimitation of outer space.

¹⁵ Art. 6 of the Rescue Agreement.

¹⁶ Art. XXII of the Liability Convention.

¹⁷ For example, in the Liability Convention, art. XXII, para. 2 provides that: "States members of any such organization which are States Parties to this Convention shall take all appropriate steps to ensure that the organization makes a declaration in accordance with the preceding paragraph."

¹⁸ More precisely, it was ESRO who declared the acceptance of both Conventions and ESA, in accordance with article XIX of the ESA Convention, took over these rights and responsibilities.

¹⁹ See M. Bourély, *L'Agence Spatiale Européenne et le Droit de l'Espace*, in ESA Bull. (13 May 1978).

²⁰ See G. Lafferranderie, *L'application par l'Agence Spatiale Européenne, de la Convention sur l'immatriculation des objets lancés dans l'espace extra-atmosphérique*, 11 ANN. AIR & SPACE L. 229 (1986).

comply with the fundamental principles of space law. Further, not only did ESA declare its acceptance of the above space treaties, but it also makes sure that they are properly implemented. For example, in December 1977 ESA adopted internal rules, in the form of a Council Resolution, to implement the provisions of the Liability Convention. In line with these fundamental principles, one may also note ESA's practice of clearing orbits of dead satellites (OTS, Olympus).

Participation in the Work of ITU

ESA, through its Member States, is an active participant at the ITU World Administrative Radio Conferences (WARC)²¹ and is involved in the discussions on allocations of frequencies and orbital positions due to its own need for frequencies for its various satellites and missions.²² The most prominent example was the Agency's Olympus programme which provided, amongst others, experimental regional European DBS services for its participating Member States.²³ Recently, the Additional Plenipotentiary Conference held in Geneva in December 1993 adopted a proposal from the High Level Committee regarding the status of intergovernmental organizations operating satellite systems which can now also participate in Plenipotentiary Conferences. ESA requested to be recognized as an intergovernmental organization operating satellite systems.

ESA and the Remote Sensing Principles

Another area where ESA is involved in the UN discussions is that of the legal principles for remote sensing satellites. ESA operates the ERS-1 satellite which provides a permanent flow of information on the Earth's environment. In the ERS-1 Declaration²⁴ the participants explicitly stated, in advance of their approval, that they accept and apply the United Nations General Assembly Remote Sensing Principles.²⁵

²¹ For example, during the WARC-92 in Malaga-Torremolinos, ESA participated as an observer in the work of the Conférence Européenne des Postes at Télécommunications (CEPT) Ad Hoc Group WARC-92 which prepared European Common Provisions (ECP's) for the Conference.

²² In 1980, ESA established the Space Frequency Coordination Group (SFCG), a coordination group of the different space agencies for areas as space research, earth exploration, meteorological satellites and space operations. ESA status at the ITU is comparable with an observer status.

²³ Bourély states that "On the basis of agreements with ESA, the European broadcasting entities using the satellite were responsible for observing the principles of Resolution 37/92 on international satellite television broadcasting." See M. Bourély, *Space Law and the European Space Agency*, in *SPACE LAW DEVELOPMENT AND SCOPE 87* (N. Jasentuliyana ed. Praeger 1992).

²⁴ M. Ferrazzani, *The Legal Framework for the Use of ERS1 Data*, ESA Bull. 104 (No. 68, 1991).

²⁵ See Annex C to the ERS Declaration. For the principles, see UNGA Res. 41/65 (Jan 27, 1987).

ESA AND THE LAW OF SPACE ACTIVITIES

ESA Telecommunication Programmes ²⁶

ESA's first experimental telecommunications satellite, the Orbital Test Satellite, was placed into orbit in May 1978 and provided pre-operational satellite communications capacity for the European PTT administrations. After the OTS, ESA developed the European Communication Satellite (ECS) series for the Eutelsat organization. ESA also developed the MAROTS satellites for the INMARSAT organization and launched the Olympus DBS satellite in 1989.²⁷ As a result of these telecommunication activities, ESA acquired a central position in Europe with respect to the development of the European satellite telecommunication industry.

ESA does not itself notify its communication satellites to apply for orbital positions and frequencies at the ITU. It is the French Government who fulfils this role on behalf of ESA. ESA studies the feasibility of certain frequencies and orbits for its future planned communication satellites. The Agency's telecommunications programme has recently been reorganized and is now being carried out under the name of Advanced Research in Telecommunications Systems (ARTES).²⁸ ESA has now started a discussion on the future of the European satellite telecommunications industry and the influence of the ongoing liberalization of this market. A working group of the Agency's Joint Communications Board (JCB) was established to examine the issue. The group's work was completed at the end of 1993 upon its submittal of its final report to the ESA Council.²⁹

In line with its projects for non-geostationary-orbit satellites,³⁰ ESA has also started considering the legal implications of such projects.

²⁶ For an analysis of the legal issues at the beginning of the Telecommunication Programmes of ESA, see W. M. Thiebaut, *Legal Framework of Communications Programs in the European Space Agency*, 5 MICH. Y.B. INT'L STUD. 125 (1984); A. Pinglier, *L'ESA et l'évolution des télécommunications spatiales en Europe*, AÉRONAUTIQUE ET ASTRONAUTIQUE 57 (No. 154-155, 1992).

²⁷ M. Bourély, *Olympus, le satellite européen de télévision directe*, 12 ANN. AIR & SPACE L. 193 (1987); P.H. Tuinder and O.M. Ribbelink, *ESA and the Development of Space Law, The Olympus Programme*, in 32 PROC. COLLOQ. L. OUTER SPACE 312 (1991).

²⁸ The ARTES programme was approved by the ESA Council on March 25, 1993.

²⁹ Full name of the Report is "Europe at the Cross-Roads: The Future of its Satellite Communications Industry," ESA SP-116, Nov.1993. The Report concludes that the R&D support given by ESA to European industry against the background of an increasing liberalization and international competition is inadequate and that satellite communications have to be seen as a fundamental economic pillar of the ESA programme.

³⁰ For example, Archimedes an ESA project which plans to provide mobile communications and digital sound broadcasting from a satellite in a Highly Elliptical Orbit.

Launching and Launching State

ESA developed the ARIANE (ARIANE 1) launcher, which performed its first successful launch in December 1979, as well as the launch pad at Kourou, within the confines of the European Space Centre and associated tracking stations. The legal basis for the development of this launcher by ESA and the commercialisation by the private company, ARIANESPACE, is a good illustration of the way space law provisions influence ESA's activities³¹ and of the particularly complex situation created by the interconnections between the ESA regime and the private regime under which the activities of Arianespace are carried out.

The execution of the development phase, which started in 1973 under an Arrangement concluded between several ESRO Member States, was carried out by the French Space Agency, CNES, under the direction of ESA. The commercialization of the ARIANE launcher was entrusted by the participating States to ARIANESPACE, a French private company created in 1979.³² To allow for such commercialization, a Declaration containing the rights and obligations of the ARIANESPACE company was accepted by Member States.³³ ESA's relationship with ARIANESPACE is implemented through a Convention between Arianespace and ESA which was signed in May 1981, and renewed in 1990 following renewal of the Declaration of Certain Governments on the Ariane Production Phase. It is stipulated in this Convention that ESA has the right of access to all company documents as well as a consultative vote on the Board of ARIANESPACE.

In the Arianespace Declaration and the Convention between ESA and Arianespace, it is explicitly provided that the participants will respect the ESA Convention and that the activities of Arianespace will be carried out for peaceful purposes.³⁴ To control the sales of Arianespace and especially whether the use of the launcher will be for peaceful purposes, a Sales Control Committee has been created. All the States party to the Ariane Declaration are represented on this Committee. Should the Committee come to the conclusion that a planned sale of the launcher is not in accordance with the peaceful uses principle, the Committee can prohibit Arianespace from carrying out this sale. Such prohibition is executed by the French government, since France is the responsible State according to Article VI of the Outer Space Treaty.

The legal arrangements for Ariane launches illustrate well the influence of space law and contract law provisions. All Ariane launches take place at the Centre Spatial Guyana (CSG), which is French territory. The CSG also includes outside facilities. Within the perimeter of the CSG, ESA had constructed the Ariane Launching Pad, normally referred to as

³¹ For an analysis of Arianespace and its relations with ESA, CNES and the French government, see V. Kayser, *Les Services Commerciaux de Lancement de Satellites - Aspects Juridiques*, in *La Lettre du C.E.R.D.I.*, Janvier 1993.

³² Shareholders of ARIANESPACE are the CNES (34.2%), European space industries (60.8%) and European banks (5%).

³³ Declaration of Certain Member States Concerning the Production Phase of ARIANE, 14.1.80. Notably this is not a legal instrument (Declaration) in accordance with Article V.I-B of the ESA Convention, but a separate international agreement.

³⁴ In accordance with art. II of the ESA Convention.

ELA.³⁵ The French government and ESA have concluded two types of agreements, one on the access and use by ESA of the CSG and its facilities and one on the functioning of the ELA. Two types of launching can be distinguished, namely, the qualification flights under the ESA research programme, and the operational, commercial launching by ARIANESPACE, with ESA as a paying customer. According to the provisions of the space treaties, there are in this particular situation several potential launching states: France, because the launch is performed on French territory and uses French facilities; ESA, because the launch pad was developed by ESA; and finally the client's, in the case of a commercial launch. These relations are governed by the CSG and ELA Agreements concluded between ESA and the French government as well as the Declaration on the Ariane Production Phase and the Convention between Arianespace and ESA. In the case of a commercial launch, relations are governed by contracts between Arianespace and its client, the insurance contracts, and the relationship described above between ESA, Arianespace and CNES.

Earth Observation and Meteorology.

In early 1972, ESA developed the experimental meteorological satellite Meteosat, in the absence of an adequate existing structure able to carry out and finance such a programme.³⁶ Thereafter, ESA promoted the establishment of an organization independent of ESA to take over the operational activities. This gave birth in 1986 to a new International Organization EUMETSAT, to manage the operational meteorological satellite system developed by ESA. EUMETSAT, which has its headquarters in Darmstadt,³⁷ is now implementing preparations for the second generation of Meteosat satellites which will be developed by ESA and owned by EUMETSAT. The first meteorological programme of the Agency began in 1972 when ESRO decided to develop a pre-operational meteorological satellite system. The first Meteosat satellite was launched in 1977 and a protocol was adopted between Participating States to cover the first five years of exploitation by ESA.

Legal problems relating to the activities of EUMETSAT have mainly focused on the relationship between EUMETSAT and ESA³⁸ and how EUMETSAT can protect its meteorological data.³⁹ This last issue is related to the legal protection of satellite remote sensing data which will be discussed later in this article.

³⁵ ELA stands for Ensemble de Lancements Ariane.

³⁶ G. Lafferranderie, *L'apport du programme Météosat opérationnel sur le plan juridique*, ESA Bull. 23 (No. 35, 1983).

³⁷ S. Courteix, *Eumetsat, l'Europe de la météorologie par satellite*, 29 ANNUAIRE FRANÇAIS DE DROIT INTERNATIONAL 624 (1983).

³⁸ For example the Météosat Second Generation Agreement concluded in February 1994 between ESA and Eumetsat contains a provision on the procurement of launchers for the three satellites to be developed.

³⁹ See generally I.H.PH DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO SPACE LAW 143-44 (Kluwer 1993) who summarizes the only known (lower) Court case dealing with protection of EUMETSAT data. See also the proceedings of the 1st Eumetsat Workshop on Legal Protection of Meteorological Data, March 13-14, 1989, Darmstadt, Germany, published by Eumetsat in 1991.

As stated above, at the time of adoption of the ERS-1 programme, the participating States explicitly declared their acceptance of the UNGA remote sensing principles. ESA's data policy reflects this through the adoption of two main principles: provision of the data on an open and non-discriminatory basis in accordance with the UNGA principles, and the claim of ownership of the ERS-1 data. This policy has been implemented in more than 20 agreements for the direct reception of ERS-1 data by third parties⁴⁰ and in several hundred distribution arrangements.

Currently, ESA is participating in the CEOS⁴¹ to define data policy principles with other space agencies for the Global Earth Observation System. Furthermore, a special Earth Observation International Coordination Working Group (EO-ICWG) has been established by the four space station partners to coordinate their respective roles in the management of remote sensing data and definition of a data policy.

Space Station

The agreements creating the cooperation between ESA, Canada, Japan and the USA for the International Space Station can be divided into two phases: Phase B and the development phase. Phase B is covered only by MOU's, for example the MOU signed in 1985 at Agency level between NASA and ESA. The Intergovernmental Agreement on the Space Station (IGA)⁴² between the States cooperating in this joint project, as well as the MOU's between NASA and each of the cooperating Agencies, which covered the development phase of this project, were signed in 1988. On the same day, an Arrangement was signed by the twelve states concerned (except Japan) to provisionally apply the IGA pending its approval or ratification.

The IGA and MOU's, which are now to be amended due to the potential participation of Russia as a new Partner, and the redesigned "Station Alpha," is the first general international implementation of principles of the space treaties and national laws of the Partners.⁴³ The IGA contains original clauses concerning cross-waiver, jurisdiction and control, exchange of information and data, criminal jurisdiction,⁴⁴ and intellectual property rights⁴⁵ on board the space station.⁴⁶ A code of

⁴⁰ See M. Ferrazzani, *ESA Data Policy*, ECSL News (9, June 1992).

⁴¹ Committee on Earth Observation Satellites (CEOS) established at the Economic Summit of the Group of Seven in Washington, 1984. ESA is a full member of CEOS.

⁴² Signed in September 1988. A. Farand, *La station spatiale et son régime juridique*, 15 ANN.AIR & AND SPACE L. 309 (1990); G. Lafferranderie, *Les Accords relatifs à la station spatiale internationale*, 22 REVUE GÉNÉRALE DE DROIT INTERNATIONAL PUBLIC 317 (No. 2, 1989).

⁴³ As commonly known, one innovation in the IGA is the introduction of the "Partner"; USA, Canada, Japan and the European Partner representing the nine participating ESA Member States.

⁴⁴ Criminal jurisdiction will be for the US when an act endangers the whole space station

⁴⁵ A. Vahrenwald, *Intellectual Property on the Space Station Freedom*, 15 EUROPEAN INTELLECTUAL PROPERTY REV. 318 (No.9, 1993); A. M. Balsano, *Industrial Property Rights in Outer Space: The Space Station International Governmental Agreement (IGA) and the European Partner*, 35 PROC. COLLOQ. L. OUTER SPACE 216-

conduct for the astronauts working on board the Space Station is still to be drafted. In conjunction with the civil status of ESA and its Convention, one must note the exchange of correspondence between the heads of the negotiations on the civil character of the Space Station.

Space Debris

ESA addressed the problem caused by space debris for the first time in a publication that appeared in 1988.⁴⁷ The Council Working Group concluded that ESA had to take immediate action in order to avoid "irreversible developments or expensive consequences." Furthermore, it advised ESA to take the necessary organizational, technical, and institutional steps to counter this threat to space flight and to seek cooperation with other concerned parties.⁴⁸ In the same year, the Council of ESA adopted a Council Resolution with respect to the space debris issue.⁴⁹ The Council also adopted an activity programme with respect to space debris⁵⁰ and formulated the following objectives: to minimize the creation of space debris in order to ensure free access to space and reduce the risk for manned and unmanned space flight; to reduce the risk on ground due to reentry of space objects; to reduce the risk for geostationary satellites; to acquire data on space debris in order to assess the extent of the problem and its consequences; and to study the legal aspects of space debris.⁵¹

The ESA Space Debris Advisory Group (SDAG) was established in 1989. This group consists of experts from the ESA Member States and is, amongst other objectives, to provide a European Forum to exchange information on space debris matters. As space debris is largely an international problem, international coordination of efforts was considered to be important. An interagency committee was established in October 1993 and the participating members are ESA, Japan, NASA, and the Russian Space Agency.⁵²

According to the reports published by the SDAG, the main problem is that there are no adequate provisions in the outer space treaties that deal with the prevention of pollution in outer space. Moreover, it was concluded that the provisions of the Registration Convention were insufficient for identifying the origin of some of the orbital debris. In 1993, ESA organised the first European conference on space debris in

28 (1992).

46 See Article 21 IGA and the discussion later on Intellectual Property Rights (IPRs) in outer space.

47 Space Debris - The report of the ESA Space Debris Working Group, Doc. ESA SP-1109 (Nov. 1988).

48 *Id.* at 68.

49 Doc. ESA/C/LXXXVII/Res.3 (final, 29 June 1989) in ESA, BASIC TEXTS, vol. IV.

50 Doc. ESA/C(89)24, rev.1, ESA Activities for Space Debris.

51 *Id.*

52 Full name of the group is Inter-Agency Space Debris Coordination Committee (IADC) and its terms of reference were accepted at the second IADC Meeting in Kalingrad/Moscow on October 25-26, 1993.

Darmstadt, Germany.⁵³

Remote Sensing Intervention for European Parliament.

As stated above, soon after the start-up of the ERS-1 programme, problems arose with respect to the legal title on whose basis protection could be assumed by the remote sensing satellite operator. For ESA, this problem became apparent when agreements had to be concluded with third parties for the reception of ERS-1 data. Although ownership of the data was claimed by ESA in these agreements, a clear legal title for this ownership was, and still is, lacking. This was the reason for the European Centre for Space Law's (ECSL) study, commenced in 1990, of the legal problems of protecting remote sensing data.⁵⁴ In 1991 a workshop was organized in Frascati where the results of this study were presented. The general conclusion was that the current legal framework is essentially inadequate and that a clear, precise, consistent and harmonized legal regime is necessary for the optimal exploitation of Earth observation data. Following this workshop, a new study continuing the work carried out in the ECSL study was issued by the European Commission at the end of 1991.⁵⁵ The purpose of this study was, amongst others, "to provide a comparative assessment of the main legal options possible and make recommendations regarding the steps towards a legal regime and the legislative measures that would best secure the interests of the providers and of the users of the data and the derived information."⁵⁶ This study, jointly managed by European Commission, ESA and ECSL representatives, was carried out in 1992 by a team of consultants under the direction of Professor Gaudrat of the University of Poitiers.

After reviewing the European legislations on protection of satellite data, the study confirmed that adequate protection is missing and that, although in some cases and in some European countries protection can be provided, the policy differs from country to country. The solution proposed in the study is to place the protection of satellite data under the umbrella of the proposed (European Commission) Council Directive on the legal protection of databases.⁵⁷ The attraction of this draft directive lies in the fact that it introduces a *sui generis* protection of (electronic) databases, so that protection is no longer dependent on creativity or authorship as under the existing scheme of protection by copyright or author's right.⁵⁸ However, to make this draft directive applicable to remote sensing data, the definition of a database⁵⁹ and the definition of

⁵³ See proceedings of the first European Conference on Space Debris, Darmstadt, Germany, 5-7 April 1993, Doc. ESA SD-01 (1993).

⁵⁴ The study was carried out by J. D. Dupuy, a Toulouse based consultant and former legal adviser of SPOT.

⁵⁵ Full title of this study: Conditions of Access to Earth Observation Data: Legal Aspects, Dec. 1992.

⁵⁶ *Id.* (Terms of reference of the study).

⁵⁷ Doc. COM(92) 24 final-SYN 393 (13 May 1992).

⁵⁸ At the same time this draft directive will create a harmonized regime in all European Union Member States and EFTA countries.

⁵⁹ Art. 1, subpara. 1 of the draft directive defines a database as "a collection

"unfair extraction" need to be clarified.⁶⁰ Following this analysis, proposals were made by the ESA Executive, after having consulted Prof. Gaudrat, to change the draft Directive accordingly.⁶¹ ESA was invited to give its view on the draft Directive at a hearing of the Legal Committee of the European Parliament on 17 March 1993.⁶² The Legal Adviser of ESA presented the Agency's view on the draft Directive, its importance for European remote sensing activities, and the need to alter the definitions in order to make it applicable to remote sensing data.⁶³

The draft Directive is still being discussed by the Council of the European Union, where the members are trying to obtain a common position which would enable the Council to send a consolidated text to the European Parliament for approval.⁶⁴

Intellectual Property Rights (IPR's) in Outer Space

Due to the planned implementation of the International Space Station, ECSL's attention was drawn to the problem of the protection and granting of patents in outer space. This resulted in a research project of ECSL to find out whether European industry and policy makers indeed considered Intellectual Property Rights in outer space a subject of concern and worth examination.⁶⁵ The results of this research were presented at a 1993 workshop in Madrid where some sixty specialists (including a representative from the World Intellectual Property Organisation) participated. Key issues were the difference between the US (first to file) and the European (first to invent) systems, the lack of specific European legislation making patent law applicable to outer space activities,⁶⁶ the influence of the micro-gravity environment on the criterion of novelty, inventive step and industrial application, and the infringement of a patent

of works or materials arranged, stored and accessed by electronic means, and the electronic materials necessary for the operation of the database such as its thesaurus, index or system for obtaining or presenting information; it shall not apply to any computer program used in the making of the operation of the database."

⁶⁰ Art. 1, subpara. 2 of the draft directive defines "the right to prevent unfair extraction" as the right of the maker of a database to prevent acts of extraction and re-utilization of material from that database for commercial purposes.

⁶¹ A letter was sent by the Director of Administration of ESA on December 4, 1992, to the Commission, explaining the interest of ESA and its Member States to have a harmonized European regulation protecting remote sensing data.

⁶² This was the first time ESA was invited to present its views at a European Parliament (Committee) Meeting.

⁶³ Full text of the intervention in Doc. PE 204.234/4.

⁶⁴ At the time of writing a modified version of the draft directive has been issued by the European Commission which appears to go into the direction ESA was proposing. For example the word "works" in the definition of a database has been deleted.

⁶⁵ For more details, see *Proceedings of the first ECSL/Spanish Centre for Space Law Workshop on Intellectual Property Rights in Outer Space, Madrid, May 26, 1993* (ECSL publ. 1993).

⁶⁶ For the U.S., see the Patents in Outer Space Act.

in outer space.⁶⁷ The conclusion drawn from the discussions was that Europe's participation in the International Space Station programme will give rise to specific problems in view of the (ten) competing national patent legislations applicable to inventions realized on the European module. The question of how European participants should ratify the IGA so that national patent law can be applicable⁶⁸ was also discussed.

In general, the workshop concluded that there was a need for worldwide harmonization of patent laws applicable to outer space activities.⁶⁹ This harmonization should take into account legislation applicable to other (non-space) activities. The harmonization should be based on common rules to be found in existing national patent laws and should firstly take the form of an international code of conduct for micro-gravity activities.

Since worldwide harmonization was considered to be necessary, WIPO was asked to take the next step to identify ways of implementing these recommendations. This year a follow-up of the study is planned to be undertaken by ECSL/ESA, possibly in cooperation with WIPO.

Astronauts Policy 70

With the International Space Station, the MIR space station, and the Shuttle flights, manned space flight is becoming more and more prominent in space activities. ESA is training its own team of astronauts⁷¹ to fly on the space shuttle and on the Russian Soyuz capsules.

It is interesting to note that provisions in the space treaties constitute only a general regime applicable to astronauts, particularly with regard to situations of distress.⁷² Some writers stated in this respect that astronauts, as envoys of mankind in such exceptional circumstances, must enjoy special treatment, and that astronauts will often be part of an international crew and work in international territory. As a result, questions have to be solved with regard to which (national) legislation is applicable, what is the responsibility of the state who has jurisdiction and control, *etc.* There is also the problem of the various terms used to describe astronauts, namely, "personnel,"⁷³ "envoy of mankind," and "representative."⁷⁴ Whatever definitional problems have arisen in the legal doctrine, multinational space crews have constituted a certain

⁶⁷ *Op. cit. supra* note 39, at 74.

⁶⁸ As done by Germany which considers for the applicability of its patent law that the work on the European module of the space station will be considered as having taken place on its own territory

⁶⁹ Here it was considered that the IGA only deals with the International Space Station and thus is limited in scope

⁷⁰ For more details, see G. Lafferranderie, *Pour Une Charte de L'Astronaute*, 12 ANN. AIR & SPACE L. 263 (1987).

⁷¹ At the European Astronaut Centre (EAC) in Cologne and in the USA and Russia.

⁷² See the Rescue Convention.

⁷³ Art. VIII of the Outer Space Treaty.

⁷⁴ See also M. Bourély, *Towards a Convention on the Legal Status of Manned International Space Flights*, 22 PROC. COLLOQ. L. OUTER SPACE 59 (1980).

practice and states or agencies conclude special agreements to arrange for the participation of other nationals in their space transportation and station missions.⁷⁵ In general, however, the regime can be described as *ad hoc* and not sophisticated enough for the time when astronauts will become regular visitors of space stations or passengers of aerospace planes (ASP) or other new single stage to orbit systems.

An attempt has been made to draft new legislation expressly for manned spaceflight.⁷⁶ Some writers go even further and conclude that there is a need for a "second generation space law" which would deal in much more practical terms with code of conduct for astronauts who could be journalists or maybe even tourists in the future. It goes without saying that in these cases they can hardly be considered as the envoys of mankind envisaged during the drafting of the space treaties.⁷⁷

In conjunction with the Spacelab programme, and the Hermes programme, ESA has studied the definition of space objects, as well as the legal implications of choices made.⁷⁸

ECSL Activities ⁷⁹

Many activities promoting the development of space law are conducted by the European Centre for Space Law (ECSL), an independent research centre operating under the chairmanship of the legal advisor of ESA. The Centre has one staff member (an ESA young graduate) and is supported mainly through funding from the Agency. Originally, the Centre was to act as a forum for exchanges of views by its European members. However, the Centre developed into a kind of small European "think-tank" on space law matters. The Centre publishes reports and a newsletter and organises workshops, research, fora for discussions and a Summer Course⁸⁰ on space law and policy which is supported by the European Union ERASMUS programme. Moreover, the Centre manages a unique database containing documents in electronic form on space treaties, ESA basic documents and space law policy papers which are accessible to its members. The Centre has currently over four hundred individual members from all interest groups of the ESA Member States.⁸¹ ECSL also reports to the United Nations on its educational activities in the framework of the UN

⁷⁵ See the ESA/NASA MOU for Space Lab and the flight of Nicholier as an ESA astronaut for the Mission to repair the Hubble telescope.

⁷⁶ Draft Convention on Manned Space Flights, a joint project of Prof. Böckstiegel, Prof. Vereschetin and Prof. Gorove. For the text, see *MANNED SPACE FLIGHT* (K.-H. Böckstiegel ed. Cologne 1993).

⁷⁷ See Y. Hashimoto, *The Status of Astronauts: Toward the Second Generation Space Law*, 36 *PROC. COLLOQ. L. OUTER SPACE* (in print).

⁷⁸ Proceedings of the Colloquium "L'avion spatial et le droit," *REVUE FRANÇAISE DE DROIT AÉRIEN ET SPATIAL* 427-571 (No. 4, 1991).

⁷⁹ See for more details the ECSL Newsletters and the two Biennial Reports of 1991 and 1993.

⁸⁰ *The Second ECSL Summer Course on Space Law and Policy*, Toulouse, September 6-18, 1993, 21 *J. SPACE L.* 170 (1993).

⁸¹ See the two ECSL Biennial Reports describing its activities in the periods 1989-1991 and 1991-1993, both available from the ECSL Secretariat.

Decade of International Law.⁸² Upon the initiative of ECSL, National Points of Contacts (NPOC's) have been established in Belgium, France, Germany, Italy, Spain, Sweden, the Netherlands and the United Kingdom.

Trend Towards Multilateralism and MOU's

Since 1992, there has been an emphasis within ESA on international cooperation for the execution of space programmes.⁸³ Apart from the political changes in Europe, the main motive for emphasizing international cooperation is the fact that space programmes are becoming more complex and costly. Cooperation allows not only the burden of cost to be shared, but also the expertise and facilities of the different partners. Cooperation is normally made possible through MOU's and agreements (at Agency level).

Influence of Charters and Development of "Soft Law"

Traditionally, cooperation between ESA and other organizations or institutions is concluded through formal agreements adopted by Council, or through the granting to certain States of the status of cooperating State, or associated State. Progressively, and in keeping with the general trend in international law, ESA is turning to soft law and is entering into cooperation where legal terms are defined in Charters or exchange of letters. Such Charters or texts set up the bodies adapted to the conduct of the programmes concerned and provide for the modalities under which these programmes will be executed and the information exchanged. As an example of such mechanisms, one may refer to the Inter-Agency Coordination of Solar-Terrestrial Science Projects,⁸⁴ where a Consultative Group was established which coordinated the six space missions to Halley's Comet undertaken by its four Member Agencies (Intercosmos, ISAS, NASA and ESA).

Coordination with other European Organizations.

ESA was the result of the European Space Conferences in the 1970's when European States came to the conclusion that the efforts of the CETS, ELDO and ESRO had to be merged in order to establish a coherent, balanced space research and development agency which, apart from science activities, also should be mandated to carry out application activities. Since the establishment of ESA, EUTELSAT, EUMETSAT and ARIANESPACE have been created as a kind of "spin-off" from ESA activities, proving that the initial work of ESA (in applications) in the area of telecommunications, meteorology and launchers was so advanced that operational organizations

⁸² See UNGA Res. 45/40 of 20. Nov. 1989.

⁸³ See ESA/C-M/CIV/Res.2 (Final) Resolution on International Cooperation (adopted on 10 November 1992 at the Council meeting at ministerial Level in Granada).

⁸⁴ R. Reinhard, *The role of the IACG and its Associated Working Groups*, ESA Bull. 81 (No. 46, 1986); R. Reinhard, *ESA Bull.* 8 (No.51, 1987) (terms of reference of the IACG are also reproduced in annex to this article).

could carry out these activities.

However, this well balanced situation, where ESA was the focal point of European space research and development activities, and at the same time building up the space industry in its Member States through its geographical return policy, is now changing. The European Union made its entry into the domain of space policy and legislation with its policy of liberalization of satellite telecommunications,⁸⁵ affecting the position of the telecommunications industry and EUTELSAT, and with its Single European Act (SEA) in 1987 which established a mandate in the area of Research and Development.⁸⁶ Apart from the enlarged mandate of the European Union (including a common defense and security policy), political and economic changes also produced this new situation for ESA.

Exploratory contacts have been established between the European Commission and ESA to seek a basis for a framework agreement between the two international organizations which would provide for improved coordination in regards to the respective research and development programmes and policy for space related activities.⁸⁷ Furthermore, ESA is asked to provide technical assistance to the Western European Union for the development of a European space-based observation programme.⁸⁸

ESA, as an international cooperative for space research and development activities, plays an important role in the further implementation of space law principles. Through its Member States, it is involved in UN discussions at COPUOS and ITU. As an actor it is confronted with the need for a practical translation of space law principles into clear legal provisions. Consequently, ESA is increasingly cooperating with the national space agencies and other international organisations to create regulations which will facilitate the activities of the Agency, its Member States, and the (European) industries and users of space services.

It is clear that international organizations, like ESA, can no longer be excluded from the process of creating and implementing space law principles. Indeed, were the space treaties to have been written today

⁸⁵ See for an overview of the questions related to the liberalization of the Satellite Telecommunication Market; The Implications of the CEC Green Paper on Satellite Communications in Europe, ECSL Proceedings of the ECSL/Dutch NPOC Workshop held at ESTEC on 27 Sept. 91

⁸⁶ Due to the ratification of the Maastricht Treaty on the European Union, The European Parliament is becoming actively involved in the Research and Development policy as it will have the right of co-decision (before the Maastricht Treaty it had only advisory power), see the procedure of Article 189(b) as amended by the Treaty on the European Union

⁸⁷ On relations EC/ESA see: K. Madders, W. Thiebaut, *Two Europes in One Space: The Evolution of Relations Between ESA and the European Community in Space Affairs*, 20 J. SPACE L 117 (1992); P. H. Tuinder, *The Implications of the Emerging European Community's Regulatory Policy Role in the Field of Space Activities*, 18 ANN AIR & SPACE L 331 (Pt. I, 1993); D. L. Boquet, *Droit Communautaire et Espace*, Jurisclasseur Droit Communautaire, fasc. 1240 (Nov. 1993).

⁸⁸ See the Western European Union Recommendation on the Development of a European space-based observation system which was adopted by its Assembly in December 1993. It is recommended that "the Council will contact the European Space Agency without delay in order to promote close cooperation between the two organizations in space matters" (Recommendation 5).

rather than three decades ago, they would have to take account of international organizations, such as ESA, and would be worded differently. The space treaties are a typical product of their time, but in the present climate additional provisions should be worked out concerning such concepts as registration, liability, jurisdiction and control. It is also important to underline the role of international organizations such as ESA in the implementation of basic space law principles, as well as complementing space law provisions with what we would like to call soft law.

EVENTS OF INTEREST

A. Past Events

Reports

The 1994 Session of the Scientific and Technical Subcommittee of UNCOPUOS Takes Place in a Constructive Atmosphere - Space Debris Issue for the First Time on its Agenda

The Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) held its thirty-first annual session at the United Nations Office at Vienna, Austria, from 21 February to 3 March 1994.

The Subcommittee, during its two-week session, continued consideration of various issues relating to international cooperation in outer space activities, including the implementation of the recommendations of the UNISPACE 82 conference, possible organization of a third space conference, remote sensing of the Earth by satellites, the safe use of nuclear power sources in space and, for the first time, discussion on the issue of space debris. The theme fixed for special attention at its 1994 session was, "Space applications for disaster prevention, warning, mitigation and relief." As in recent years, there were no apparent East-West conflicts. North-South differences on economic and development issues remained strong but were discussed in a spirit of consensus free from heavy confrontation. The session of the Subcommittee took place in a constructive atmosphere. This was in line with the trend already evident during the past years and resulted in moderate progress in most issues covered during the Subcommittee. Initial exchange of views which took place for the first-time on the issue of space debris and continued positive discussions on the possibility of holding a third UNISPACE conference made the Subcommittee meetings an overall success. The work of the Subcommittee on these and other issues took solid steps forward and provided a good momentum for further future discussions.

This year's Subcommittee session included a symposium organized by COSPAR and IAF on the theme "Space applications for disaster prevention, warning, mitigation and relief." The symposium included technical presentations on the contribution of space applications to the observation and warning of disasters and for understanding earthquakes and volcanic eruptions. Other presentations described the use of remote sensing satellites to monitor severe weather events as well as for mapping and quantifying desertification and land degradation. Moreover, presentations were made on space applications for mitigation and warning of floods and droughts, as well as the use of satellites for purposes of maintaining global food security. In addition to the presentations in the symposium, Member States arranged a number of special presentations. These included a presentation by astronaut *Dr. K. Bowersox* of NASA, and astronomer *Dr. R. Albrecht* of ESA on the Space Shuttle mission to repair

the Hubble Space Telescope and the first scientific results from the repaired telescope, a scientific presentation by astronaut *Dr. U. Walter* of DLR on the flight of Spacelab D-2 as well as other presentations on remote sensing, nuclear power sources in outer space, and the space microaccelerometer.

United Nations Programme on Space Applications

The expanded mandate of the Programme on Space Applications of the Office for Outer Space Affairs, under the direction of the Subcommittee covers six major areas: Provision of long-term fellowships; organization of training courses, workshops and conferences; provision of technical advisory services; development of indigenous capability at the local level; provision of space information and promotion of greater cooperation in space science and technology. The major objectives of the Programme on Space Applications is to assist developing countries by providing access to information on the use of space technology that will further their economic and social development. To this end, the Programme organizes short-term training courses and workshops on applications of space technology for economic and social development for the benefit of developing countries. The Programme also administers fellowships for long-term education in space-related disciplines; the fellowships are tenable in Brazil, China and at various institutions of the European Space Agency. The Programme also provides developing countries, on request, with advice on the organization and planning of national and regional space applications programmes.

The Subcommittee noted that, in 1993, the Programme had successfully conducted three training courses, three workshops and two regional conferences. These activities covered various aspects of remote sensing including remote sensing education for university educators, applications to geology and its applications in preventing and mitigating the effects of natural disasters, satellite communications for development, space science and technology for sustainable development and basic space science. These were held in Greece, Indonesia, Italy, Mexico, Nepal, Nigeria, Senegal and Sweden. Moreover, the Subcommittee approved proposed activities of the Programme for 1994 including meetings on space applications in the fields of environmental and natural resources monitoring, remote sensing, basic space science, combating and preventing natural disasters, sustainable development and satellite communications. The Subcommittee expressed its appreciation for the contributions of host countries, other supporting countries and to ESA for having made these activities possible. It also expressed its concern that, in order to continue this heavy load of activities, the resources available to the Programme would have to be augmented.

The Programme provided consulting services in support of regional space efforts, including, (i) collaboration with ESA on the selection of projects in Africa that are to receive remote sensing data from two ESA remote sensing ground receiving stations at Maspalomas, Spain and Fucino,

Italy; (ii) promotion of regional operation, administration and funding of the Cotopaxi (Ecuador) remote sensing receiving station; (iii) assistance to the Government in Chile in organizing the Second Conference of the Americas, as well as in its follow-up as *pro tempore* Secretariat to provide continuity to its outcome; and (iv) assistance to the Republic of Korea and specifically in the establishment of the Asia-Pacific Satellite Communications Conference (APSCC).

The Programme continues to contribute to the promotion of cooperation in space science and technology and related fields at the regional level. The realization of the initiative of the United Nations to establish regional Centres for Space Science and Technology Education in developing countries will reinforce cooperation among developing countries as well as between the industrialized and developing countries. An emphasis of these regional centers is to educate university teachers in developing countries who can pass their knowledge and skills on to large numbers of students. A number of developing countries have offered to host and support these centres. Evaluation missions to potential host countries and institutions in each region are being undertaken with the participation of potential supporting countries and organizations. Missions to identify potential host countries for these centers have already been made, and countries, such as Brazil, Iran and Mexico, have been identified as viable locations. The Subcommittee noted that similar missions to other regions would be undertaken and expressed its support for this initiative.

Use of Nuclear Power Sources in Outer Space

The Subcommittee continued its consideration of the use of nuclear power sources in outer space both in the Subcommittee and its Working Group on this issue. When the Principles on the use of nuclear power sources in outer space were adopted, the enunciated aims and objectives were somewhat limited. From the date of adoption, it was assumed that new applications of nuclear power in space would be developed and international principles on radiological protection would be formulated. It was agreed, therefore, that these principles applied, in a limited sense, only to use of nuclear power sources in outer space for purposes of generating power for satellite operations and not for propulsion. The principles therefore provided that they should be reopened for possible revision within two years of their adoption. During the thirty-first session, the United States, in its statement on the safe use of nuclear power sources in outer space, stated that after a review of its position on the Principles, it had determined that while the Principles have no binding effect on national programmes, U.S. policy and practice in the use of nuclear power sources in outer space is fully consistent with the overall objective and intent of the Principles. Hence, the United States did not see, for the time being, a need for revision of the Principles.

Although Principle 11 provides that these Principles should be

reopened for review and revision by the Committee on the Peaceful Uses of Outer Space no later than two years after their adoption, in the Working Group's report, as adopted by the Subcommittee, it was agreed by consensus that the Principles should remain in their current form until such time as they were amended. There was general agreement that a proper consideration of the aims and objectives of any proposed revision of the principles should be agreed upon before any specific revisions would be considered. It was also considered that the Subcommittee and the Working Group should continue to receive the widest inputs on matters concerning the use of nuclear power sources in outer space and any contribution related to broadening the scope and application as well as better aligning the Principles with the relevant recommendations of the International Atomic Energy Agency (IAEA) and the International Commission on Radiological Protection (ICRP) would be accepted. The Subcommittee also noted and welcomed the offer made by the IAEA to provide materials bearing on the Principles. The Subcommittee agreed to continue discussion on the issue next year.

Remote Sensing and Environmental Monitoring

During the course of the debate, delegations continued to review the national and cooperative programmes in remote sensing. Examples were given of national programmes in developing and industrialized countries and of international programmes based on bilateral, regional and international cooperation. The Subcommittee also noted special presentations on the remote sensing activities of Brazil, China and India. As in previous years, many developing countries called for non-discriminatory access to remote sensing data and information. The Subcommittee emphasized the importance of making remote sensing data and analyzed information available to all countries at a reasonable cost and in a timely manner and encouraged continued international cooperation in the use of remote sensing satellites. The Subcommittee particularly noted the importance of sharing experiences and technologies through cooperative regional use of remote sensing systems for environmental monitoring and, in the spirit of Agenda 21 of the 1992 United Nations Conference on Environment and Development, urged the international community to fully utilize remote sensing data in the effort to implement the recommendations of this Agenda. The Subcommittee recommended that the item be retained on its agenda for the next session.

Space Debris

In accordance with General Assembly resolution 48/39 of 10 December 1993, the Subcommittee, for the first time, began consideration of the issue of space debris as an agenda item. Several delegations expressed their views on the dangers posed by space debris. Since 1957, over 3500 launches have taken place. These, and in turn new, launches

have resulted in the creation of an ever-expanding debris population in Earth orbits. It was generally understood that space debris could become a problem that all space-faring nations must consider when planning and implementing future space activities. The Subcommittee agreed that international cooperation was needed to develop strategies to minimize the potential impact of space debris on future space missions.

The Subcommittee heard special presentations on space debris by experts from France, Germany, India, United Kingdom, United States and ESA. This gave the Subcommittee a better understanding of the sources of debris, probabilities of collision and other matters relevant to this issue. The Subcommittee agreed that it was necessary to have a firm scientific and technical understanding of the space debris problem. To this end, the Subcommittee agreed that it should focus on understanding certain aspects of research related to space debris, including debris measurement techniques, mathematical modelling, characterization of the space debris environment and spacecraft design. The Subcommittee agreed that it should develop a continuing, deliberate, and specific multi-year plan for its work on this agenda item. The Subcommittee agreed to continue its consideration of the item at its next session.

The Geostationary Orbit and Space Communications

The Subcommittee continued its examination of the physical nature and technical attributes of the geostationary orbit. Delegations reviewed national and international cooperative programmes in satellite communications and also discussed progress made in communication satellite technology that would allow easier access to and increase the capacity of the geostationary orbit and the electromagnetic spectrum. As in previous years, developing countries were of the opinion that the geostationary orbit was a limited natural resource and that saturation should be avoided to allow equitable and non-discriminatory access. Industrialized countries noted that the risk of collision of satellites in geostationary orbit with space debris remained very low and that it was more important for satellites to be made inert after their useful life. These delegations felt that questions related to the geostationary orbit, particularly the allocation of frequencies, were being effectively dealt with by the International Telecommunications Union (ITU). In terms of equitable access, equatorial countries noted their concern with the characteristics of the geostationary orbit and stated further that a *sui generis* regime should be established for this special part of space. The Subcommittee requested that the Secretariat bring to the attention of the Legal Subcommittee, the studies prepared on the physical and technical attributes of the geostationary orbit* to determine if further study and

* Physical Nature and Technical Attributes of the Geostationary Orbit (Study prepared by the Secretariat), U.N. Doc. A/AC.105/404 and Add.1; The Feasibility of Obtaining Closer Spacing of Satellites in the Geostationary Orbit (Study conducted

review should be performed on this matter. The Subcommittee recommended that consideration of this item be continued at its next session.

UNISPACE Conference

In accordance with the General Assembly, in both the Subcommittee and Working Group of the Whole, the Subcommittee discussed the possibility of holding a third UNISPACE conference. The discussion focused on defining a set of sharply focused objectives for such a conference as well as details relating to venue, organization, timing and funding. Working papers were submitted by Pakistan and India and by the Group of 77. The Subcommittee agreed that these papers constituted a basis for further discussion on the matter. The Subcommittee requested that the Secretariat, in time for the next session of the Committee, prepare a comprehensive report on the likely organization, funding and logistical implications of holding such a conference. Because of the changes in the international environment, which have a bearing on space programmes around the globe, and the many advances in space technology and the applications of that technology, the Subcommittee agreed that it was important to continue the discussions on the possibility of holding such a conference with as many participants as possible. India, as it did at last year's COPUOS meeting, proposed Bangalore as a possible venue for the third UNISPACE conference. The Subcommittee recommended that the Committee at its next session in June continue discussions and agreed to continue consideration on the matter at its next session with the view to coming to an early decision.

Matthew W. Sanidas
Associate Legal Affairs Officer
Office for Outer Space Affairs
United Nations Office at Vienna

1994 Session of U.N. Legal Subcommittee on Space Reasonably Successful

On 21 March 1994, the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) convened its thirty-third session at the United Nations Office at Vienna. The three-week session, which ended on 5 April, was chaired once again by *Mr. Václav*

with the assistance of a group of experts), U.N. Doc. A/AC.105/340, Corr.1, Corr.2 and Rev.1; Efficient Use of the Geostationary Orbit (Background Paper: UNISPACE 82), U.N. Doc. A/CONF.101/BP/7; Physical Nature and Technical Attributes of the Geostationary Orbit (Study prepared by the Secretariat), U.N. Doc. A/AC.105/203, Add.1, Corr.1, Add.2, Add.3, and Add.4; and Reports Pertaining to the Use by Satellites of Positions in the Geostationary Orbit (Note by Secretariat), U.N. Doc. A/AC.105/149.

Mikulka of the Czech Republic.

The session was attended by 45 of the 53 States members of the Subcommittee, including Argentina, Australia, Austria, Belgium, Brazil, Bulgaria, Cameroon, Canada, Chile, China, Colombia, Czech Republic, Ecuador, Egypt, France, Germany, Greece, Hungary, India, Indonesia, Iran (Islamic Republic of), Iraq, Italy, Japan, Kenya, Mexico, Mongolia, Morocco, The Netherlands, Niger, Nigeria, Pakistan, Philippines, Poland, Romania, Russian Federation, Sierra Leone, Spain, Sudan, Sweden, Ukraine, United Kingdom of Great Britain and Northern Ireland, United States of America, Uruguay and Venezuela. Also in attendance were five specialized agencies and other international organizations, including the Food and Agriculture Organization (FAO), the International Atomic Energy Agency (IAEA), the International Telecommunication Union (ITU), the European Space Agency (ESA) and the International Astronautical Federation (IAF), as well as ten observers (Algeria, Cuba, Israel, Nicaragua, Peru, Portugal, Republic of Korea, South Africa, Turkey and Yemen).

Pursuant to the recommendations of the thirty-sixth session of COPUOS (held in June 1993),¹ which were endorsed by the General Assembly at its 48th session (December 1993),² the Legal Subcommittee reestablished working groups to consider the following three substantive items on its agenda:

(I) Question of early review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space (agenda item 3);

(II) 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 (agenda item 4); and,

(III) Consideration of the legal aspects related to the application of the principle that the exploration and utilization of outer space should be carried out for the benefit and in the interests of all States, taking into particular account the needs of developing countries (agenda item 5).

As a whole, the session of the Subcommittee was reasonably successful. In the Plenary, there was little discussion on agenda item 3. With regard to item 4, discussions continued in greater and seemingly more constructive detail. The discussion of item 5 was very productive, based on constructive feedback received from several countries.

¹ See *Report of the Committee on the Peaceful Uses of Outer Space*, General Assembly Official Records, 48th Session, Supplement No. 20 (A/48/20).

² See Doc. A/Res/48/39 of 10 December 1993.

Item 3. "Question of Early Review and Possible Revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space"

The Working Group on this item was reestablished, under the Chairmanship of *Mr. Frank Cede*, the representative of Austria. The debate on this item was brief. The delegation of the United States, in its opening remarks, set the tone of the meeting by stating that United States policy and practice regarding the use of nuclear power sources in outer space were consistent with the objectives and intent of the Principles. Therefore, in its opinion, no revision of the Principles³ was necessary and that the Principles, in their present form, should remain in force until a complete set of new Principles was agreed upon. The United Kingdom, France, Germany and several other Member States supported this view. They believed that the Legal Subcommittee should await the results of the discussions on this matter in the Scientific and Technical Subcommittee (S&T) before taking any action of its own.

Some delegations said that a proper consideration of the aims and objectives of any proposed revision of the Principles, when undertaken, should be agreed upon before any specific amendments were considered. The revision should be aimed at strengthening the levels of safety provided by the Principles to consider the environmental implications of the use of nuclear power sources in outer space. In this regard, one delegation remarked that, in order to avoid the contamination of the environment, the use of nuclear power sources in outer space should be limited to those space missions that could not be reasonably executed without such sources.

It was suggested by the representative of a Member State that a review and revision of the Principles could establish a similar legal framework as that existing in other branches of international law as, for example, in the law of the sea which addresses issues like transboundary pollution and the carriage of dangerous goods.

The Working Group decided to suspend discussion of this item for one year, pending the results of the discussions on this matter in the Scientific and Technical Subcommittee's 1995 session. If the S&T debate showed progress, only then would the Legal Subcommittee reconvene the Working Group on this item next year. The item would, however, be maintained on the agenda of the Legal Subcommittee so that States could continue the debate in the Plenary.

Item 4. "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"

³ The Principles Relevant to the Use of Nuclear Power Sources in Outer Space were adopted by General Assembly Resolution 47/68 of 14 December 1992.

Orbit without Prejudice to the Role of the International Telecommunications Union

The Working Group on this item was established, under the Chairmanship of Mr. Estanislao Zawels, the representative of Argentina. As in previous years, the Subcommittee discussed two issues under this agenda item: "Question of the definition and delimitation of outer space" and "Question of the geostationary orbit."

With regard to the first issue, the Working Group mainly concentrated, at the Chairman's suggestion, on the informal working paper "Draft questionnaire concerning aerospace objects" which he had circulated at the 1993 session of the Subcommittee.⁴ The Working Group did not examine each provision of the questionnaire but, instead, discussed the paper in general terms and looked at the overall purpose and usefulness of the document.

To further the discussion, the Chairman prepared an introduction to the questionnaire, explaining that the latter's objective was to obtain replies from Member States, and on the basis of the answers the Subcommittee could then perhaps make progress in its work in this matter. In this regard, one delegation suggested that the replies received from Member States could also, *inter alia*, provide an answer to the question of whether existing law would suffice or whether a special new legal regime should be elaborated for aerospace objects.

Regarding the nature of the questionnaire, several delegations commented that it was made up of questions which were of both a technical and legal nature, and that they should be distinguished, and the technical questions might best be answered by a body with scientific and technical competence. For the work in the Legal Subcommittee, the draft questionnaire ought to be limited to legal questions in order to better correspond to the objectives of the Working Group.

Some delegations were of the opinion that the focus of the draft questionnaire should be directed at practical matters like determining relevant State practice with respect to aerospace objects and obtaining information on existing national legislation on the matter. Further, one delegation said that it would be useful to find out at what altitude of an object's flight an underlying State would not exercise its rights and obligations under air law with regard to that object. The delegation believed that this information might help to address successfully the

⁴ "Informal paper by the Chairman of the Working Group (Doc. A/AC.105/C.2/1993/CRP.1 of 29 March 1993): Draft questionnaire concerning aerospace objects", reproduced as an Appendix to the report of the Working Group on agenda item 4 (Annex II). See Doc. A/AC.105/544 of 15 April 1993, the Report of the Legal Subcommittee on the work of its thirty-second session, at pages 20-21. The legal questions raised in the paper deal, *inter alia*, with the definition of aerospace objects, the passage of space objects over foreign territory during their re-entry into the Earth's atmosphere, the question of the application of air law to aerospace objects, and the registration of aerospace objects. The questionnaire draws on and expands the working paper entitled, *Questions concerning the legal regime for aerospace objects*, submitted by the Russian Federation during the 1992 session of the Legal Subcommittee: See Doc. A/AC.105/C.2/L.189 of 30 March 1992, reproduced in Doc. A/AC.105/514 of 20 April 1992, Report of the Legal Subcommittee on the Work of its thirty-first session, at 48-49.

question of determining the upper limit of State sovereignty.

This question - whether it was really necessary to establish a boundary between airspace and outer space - was again raised. One delegation said that in more than 30 years of the peaceful exploration of outer space there never had been a practical problem caused by the lack of a boundary between airspace and outer space, and that any attempt to establish such a boundary could cause more problems than it would solve. Several delegations suggested that, where the definition and delimitation of outer space was concerned, an approach similar to that as used for the demarcation of maritime boundaries in sea law might be applied.

Very little progress was made in the discussions on the substantive part of the questionnaire. It was hoped, however, that an understanding on this issue could be reached at the next session of the Subcommittee.

With respect to the second matter, that of the geostationary orbit, the Working Group reviewed Colombia's working paper "Geostationary satellite orbit"⁵ paragraph-by-paragraph. The delegation of Colombia introduced the paper and explained that its purpose was to develop legal principles like equity and efficacy, which were already norms of positive law as contained in the treaties of the International Telecommunication Union (ITU). The paper sought a legal solution to guarantee, in practice, equitable access to the Orbit through the establishment of certain preferential rights for developing countries and countries that currently do not have access to the Orbit. The delegation of Colombia was clear that such a regime would be without prejudice to the technical role of the ITU.

Again, the positions of the delegations regarding the status of the Geostationary Orbit were very clear. In general, the developed countries maintained that the Orbit was part of outer space and therefore regulated by the space treaties, especially the Outer Space Treaty of 1967; most developing countries agreed that the Orbit was a part of outer space.⁶ Its special characteristics and features, however, and the fact that it was a limited natural resource⁷ which was in the danger of becoming saturated, required the creation of a *sui generis* regulatory regime to ensure equitable access to the Orbit. Further, in one delegation's view, the Outer Space Treaty was a general international instrument and it did not apply to the special situation that applied to the Orbit.

The question whether the Legal Subcommittee had a mandate to develop legal principles regarding the geostationary orbit was again raised and discussed. Developed countries believed that the Legal Subcommittee did not have a mandate to develop principles of law or a special legal regime for the Geostationary Orbit. The ITU had been quite successful in dealing with various aspects of the rational and equitable use of the Orbit

⁵ Submitted by Colombia at the 1993 session of the Committee. See Doc. A/AC.105/C.2/L.192, of 30 March 1993, reproduced in Docs. A/AC.105/544 and A/AC.105/573, being the reports of the Legal Subcommittee's 1993 and 1994 sessions, respectively.

⁶ Ecuador, however, maintained that since outer space had not so far been delimited, it could not be affirmed that the Geostationary Orbit was a part of outer space.

⁷ This fact being recognized in the ITU treaties.

and it was necessary to avoid any possible conflict with the ITU and the Subcommittee. The developing countries, however, were of the opinion that the Subcommittee did have a mandate to develop new principles. In fact, the Subcommittee's work was complementary, and not contradictory, to that being carried out by the ITU. One delegation pointed out that the working paper was trying to fill in the legal gaps with regard to the Geostationary Orbit that existed in the ITU legal regime, without prejudice to the role of the ITU. On the whole, a very productive debate took place, with several Member States making positive comments regarding the working paper. These suggestions could serve as a basis for future drafts submitted for consideration by the Subcommittee.

A suggestion was made during the course of the debate that a legal seminar on space debris in the Geostationary Orbit should be organized at the next session of the Subcommittee. This gave rise to some controversy. Some Member States, especially from the developed countries, did not wish to have a discussion on space debris in the Legal Subcommittee at this time. They were of the view that the Scientific and Technical Subcommittee should first complete a thorough and complete examination of the matter. While there was no agreement on the matter, the general feeling was that such a seminar, if organized, should be outside the scope of the Subcommittee's normal work.

Item 5. "Consideration of the Legal Aspects Related to the Application of the Principle that the Exploration and Utilization of Outer Space Should be Carried out for the Benefit and in the Interests of all States, Taking into Particular Account the Needs of Developing Countries"

The Working Group on this item was reestablished, under the Chairmanship of *Mr. Raimundo González*, the representative of Chile. Of the three substantive items on the agenda, the greatest progress was made on this item. Two more States, Egypt and Iraq, added their names to the list of sponsors⁸ of the working paper "Principles regarding international cooperation in the exploration and utilization of outer space for peaceful purposes".⁹ The Working Group discussed the working paper paragraph-by-paragraph, with the delegation of Brazil, the spokesperson for all co-sponsors, introducing each paragraph, in turn.

At the outset, some Member States questioned the need for such principles. In the first place, there existed significant international cooperation in the peaceful uses of outer space. They argued that a set of principles would only limit a State's sovereign right to choose with whom, and how, one State could cooperate with another in outer space activities,

⁸ Argentina, Brazil, Chile, Colombia, Mexico, Nigeria, Pakistan, Philippines, Uruguay and Venezuela.

⁹ See Doc. A/AC.105/C.2/L.182/Rev.1, of 31 March 1993, reproduced in Docs. A/AC.105/544 and A/AC.105/573, being the reports of the Legal Subcommittee's 1993 and 1994 sessions, respectively.

and this would also limit the extent of current cooperation. Also, they were concerned about the possible infringement of their sovereign rights with respect to international cooperation. The counter argument was made that the principles would serve only to facilitate international cooperation, and in no way would they limit one State's right to cooperate with another. The principles would, in fact, serve to enhance international cooperation. Some delegations pointed out that, in any case, principles adopted by General Assembly resolutions are not legally binding on Member States.

Nevertheless, a very constructive debate took place in the Working Group. Considerable progress was made in the discussions on this item because the delegation of France voiced its concerns regarding the principles and, in addition, the delegations of the Russian Federation and the United Kingdom made helpful suggestions regarding the working paper.

These concerns and comments were summarized in his concluding remarks by the Brazilian delegation as follows: a) a high level and long history of successful cooperation in the peaceful uses of outer space had existed without the proposed principles; b) any set of principles could be a source of concern since they would either be legally binding or might serve no purpose; c) there should be adequate compensation for technology transfers; d) questions relating to intellectual property must be addressed; e) security issues related to non-proliferation must also be examined; f) the practices of States with regard to international cooperation should be analyzed; g) developing countries required adequate institutions in order to be able to benefit from cooperation; h) discussions on that question should not be focused on "haves" versus "have-nots"; and, g) the co-sponsors, at the next session of the Subcommittee, should provide information on how they viewed a framework for the practice of international cooperation.

Brazil, on behalf of the co-sponsors, stated that these comments may allow the co-sponsors an opportunity to examine, review and revise the principles and therefore present a revised working paper at the next session of the Subcommittee.

Jitendra S. Thaker

Legal Affairs Officer

U.N. Office for Outer Space Affairs

Issues of Supreme Authority and Sovereign Rights Arising out of Space Activities

The meeting of the International Space Law Interest Group of the American Society of International Law on April 7, 1994, in Washington D.C., focusing on "Vexing issues of supreme authority and sovereign rights arising out of space activities," fitted well into the broad overall theme of the Annual Meeting of the Society which dealt with the perceived transformation of the concept of sovereignty.

In his introduction, Professor *Stephen Gorove* of the University of Mississippi Law Center, who chaired the meeting, noted that in looking at

the notion of sovereignty, a multitude of thoughts may flash through one's mind. They may include the Bodinian origins of the term, its transformation from the time of absolute monarchies to the popular manifestations of national sovereignty. They may cover its somewhat simplistic "indivisible" characterization or its more meaningful perception as an allocation of authority and control among different bodies internally and externally. Historic examples have occasionally also revealed a sham semblance of claim to sovereignty when authority and/or control lay in fact in a foreign entity. Today there are many varying manifestations of sovereignty and sovereign rights in different contexts and regions of the world.

The Chairman pointed out that the topic under discussion is much narrower in that it attempts to deal with issues relevant to the exercise of supreme authority and sovereign rights, including jurisdiction and control, over space objects and personnel in outer space as well as such issues relevant to the passage of space objects and envisaged future aerospace objects through foreign airspace. The multitude of issues that the panel could address included a possible criticism that the concept of sovereignty is characterized as "supreme authority and control exercised over people, resources and institutions in a given geographical area." Beyond this initial clarification of the concept, he alluded to a long list of specific issues and policies. Has sovereignty been abolished in outer space as frequently asserted? What about its functional aspects? Are the rights of jurisdiction and control unfettered? What, if any, are the erosions of sovereignty? Can there be an opting out in the future?

Gorove noted that a core issue raised in a recent article in the JOURNAL OF SPACE LAW by Dr. N. Jasentuliyana, Director of the U.N. Office for Outer Space Affairs in Vienna, has been whether jurisdiction, control and ownership over space objects are permanent.¹ According to Jasentuliyana, legal opinion favors permanency but he adds that removal of space debris could occur without consent if the hazard presented by the space object threatens the safety of spaceflight. He also states that in order to perform any space salvage operation with the intent of cleaning up the space environment, one must ask under what circumstances, if any, may a State either lose jurisdiction and control of a space object or cede any existing rights to that space object. To the question whether launching States are bound to capture and remove space objects that hinder the right of access of other States to space orbits, Jasentuliyana effectively answers no, because there is no positive duty placed on the launching States to remove inactive objects from orbit.² However, because of the work of WARC in the implementation of an *a priori* planning regime for nominal orbital

¹ N. Jasentuliyana, *Regulation of Space Salvage Operations: Possibilities for the Future*, see *infra* p. 5, at 13.

² *Id.* at 15.

positions and bandwidths, he notes that the authenticity of what has been the "first come, first served" principle may no longer be valid. He comes to the conclusion that an international group of experts should be brought together to formulate standards, practices and guidelines to effectively regulate access to certain orbits in order to guarantee that both current and future users will have continual and nondiscriminatory access.³

The other important issue relating to the panel topic was whether a space object may pass through the airspace of a foreign country during the ascending or descending phases of its flight in non-accidental conditions without the prior authorization of the underlying State? Should a different rule apply to aerospace objects, like the contemplated aerospace plane capable of flying in the air like conventional aircraft and also capable of moving in outer space? Should the norms of national and international air law be applicable to an aerospace object while it is in the airspace of another State? Judge *Guillaume* of the International Court of Justice, during an International Space Colloquium in Paris, put the question in this way, "should the aerospace plane be subordinated to the regime of air law or to that of space law or will it be necessary to imagine for it a new autonomous regime?"⁴ A Working Paper (1992) of the Russian Federation submitted before COPUOS stated the issue somewhat differently: "Should the regime applicable to the flight of an aerospace object differ according to whether it is located in airspace or outer space?"⁵ In their view, the answer to this question was in the affirmative. In this connection, *Dr. Vereshchetin* suggested as a possible single criterion the mission of the aircraft or of the aerospace system. On this criterion would indirectly depend the environment (airspace or outer space) in which the aerospace plane has to accomplish its mission. Thus vehicles which would serve the purpose of air transport, would simply be 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.⁶ The net result would be that since, in the absence of an international agreement providing otherwise, there is no rule of international air law allowing foreign aircraft to transit through national airspace, 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.⁷

In relation to all of these issues one may look at the doctrine embodied in international treaties, customary law, general principles of

³ *Id.*

⁴ Cited by V. Kopal, *Some Considerations on the Legal Status of Aerospace Systems*, see *infra* p. 57, at 68.

⁵ *Id.*

⁶ *Id.* at 69.

⁷ *Id.* at 71 (citing Christol).

law or writings of eminent publicists and evaluate the consequences of each position for policy and value preferences. For instance, the question may be asked whether international customary law exists with respect to the passage of space objects through foreign airspace in the course of their ascent to or descent from outer space under normal (*i.e.* non-accidental) conditions? The Chairman noted that there were differences of opinion on this even in the United States as revealed by a recent Questionnaire conducted by the American Branch of the Space Law Committee of the International Law Association (ILA).⁸

Following the Chairman's opening tone setting remarks, he introduced *Paul G. Dembling*, a senior counsel with the law firm Schnader, Harrison, Segal & Lewis, who served for many years as General Counsel of NASA and later also as General Counsel of the General Accounting Office. He was the architect of the NASAct and a leading participant in the drafting of the various international space treaties as a member of the U.S. delegation to the Legal Subcommittee of UNCOPUOS.

Dembling, first of all, drew attention to the fact that the boundless areas of space presented enormous challenges to all, including both the physical and the social scientists. He noted, for instance, that social scientists must consider the impact of weather forecasting on conservation programs and national agricultural policies, and even on such corollary issues as price guarantees and subsidies. In his view, social scientists will have to be concerned with the myriad of problems engendered by space activities in various countries of the world. He also recalled that the National Aeronautics and Space Act of 1958⁹ stated the policy of the United States -- "that activities in space should be devoted to peaceful purposes for the benefit of all mankind." If this end is to continue to be achieved, there must be effective and enforceable international agreements.

Notwithstanding the development of a body of space law, Dembling noted that there are some significant legal problems which are still being debated. Among them is the question of whether or not there is, or should be, an upward limit of territorial sovereignty. While every nation has the unquestioned right to exclude any foreign power from entering its air space, very few seriously contend today that such a rule should apply in outer space. Of the satellites launched, many are still in orbit. No permission was sought in advance to launch these satellites; none was expressly given, and not a single protest has been registered by any State. By the actions of the States engaged in this activity, it appears that a new principle of international law has been established. This principle is that outer space is not subject to claim of territorial sovereignty, that no State has the right to exclude other States from the use of any part of it, and that

⁸ Scheduled to be published in the Proceedings of the ILA's American Branch.

⁹ 42 U.S.C. 2451 *et seq.*

it is, therefore, freely available for exploration and use by all, much as the high seas are free. Dembling stressed that this does not mean, of course, that activities which threaten international peace and security are to be permitted in outer space, nor does it mean that a State is not free to take legitimate measures in outer space for self defense.

As to the issue of where does the airspace end and outer space begin, Dembling recalled that we have been wrestling with this issue close to 40 years and there does not appear to be any ready solution to this problem. The Outer Space Treaty of 1967 established an international legal regime for the space environment without providing a specific definition or delimitation of outer space. The legislative history of Article I of the treaty makes it clear that the exploration, use, and exploitation of the area was to be free to all. This could not be true if there were to be an appropriation in the sense of an exclusive control of the natural resources in the area. Therefore, notwithstanding the claims of equatorial countries embodied in the 1976 Bogota Declaration, it has never been considered that the geostationary orbital position could be appropriated by a juridical or natural person.

Another interesting, and more debated issue, according to Dembling, relates to the matter of ownership and use of natural resources found in space. While Article II of the Outer Space Treaty bars the assertion of claims of national sovereignty the question remains whether or not it bars claims of ownership asserted by private individuals and entities? Do private individuals and entities gain certain legal rights by virtue of possession of natural resources? To what extent is existing law applicable to acquisition of natural resources on earth applicable to acquisition of natural resources in outer space? To what extent should uses of natural resources in outer space by private entities and individuals be subject to national or international regulation, and what form should such regulation take? In response to these questions, Dembling noted that Article IX of the Outer Space Treaty as a whole establishes a basis for the proposition that the commercial utilization of natural resources found in outer space must be for the benefit of all, and not for the self-interest of some and to the detriment of the interest of others.¹⁰

As an example of the kinds of practical legal problems that arise when space is used for commercial purposes, Dembling drew attention to the interesting question of the legal status of property manufactured in outer space or on a celestial body from both material imported from earth and from natural resources found in space. If ownership of property on earth is unchanged by reason of its export to space, but natural resources in space are not subject to claims of ownership, the ownership status of a mixture of the two may depend upon some percentage test applied to the

¹⁰ The first sentence of Article IX provides: "In the exploration and use of outer space, including the moon and other celestial bodies, States Parties to the Treaty shall be guided by the principle of cooperation and mutual assistance and shall conduct all their activities in outer space, with due regard to the corresponding interests of all other States Parties to the Treaty".

composition of the item, or the method of its manufacture, the status of the manufacturer, or some other criterion or combination of criteria. Dembling felt that, aside from the projections of commentators, hard thinking on such matters must await the evolution of factual situations requiring legal resolution.

Since *Gerald Mussara*, of Lockheed Missiles and Space Company could not be present, Prof. *Paul B. Larsen* of Georgetown University Law Center was the last speaker who focused his remarks on what he regarded as recent changes in space law's concept of sovereignty. In his presentation, Larsen reviewed three distinct areas relating to global positioning satellites (GPS), direct broadcast satellites (DBS) and remote sensing satellites.

With respect to GPS which were to guide, *inter alia*, the navigation of airplanes in the airspace, ships on the water, and intelligent vehicles on land surface, he noted that they were recently declared operational by the U.S. Secretary of Transportation. These satellites provide world-wide coverage for airplanes, ships and intelligent vehicles not only in U.S. sovereign airspace but also in foreign sovereign airspace and over the high seas. While the satellites themselves do not enter the sovereign space of States, the signals which control the navigation in sovereign space of aircraft, ships and vehicles do. Larsen observed that the lack of a claim of invasion of foreign airspace by these signals can be explained by the amazing utility of GPS.

Larsen saw comparable challenges to the concept of sovereignty by communications satellites that broadcast into foreign sovereign airspace. He observed that the restrictive attitudes reflected in the 1982 U.N. Resolution dealing with DBS appear to have withered since then. For instance, the Europeans have had uncontroversial experience with crossborder DBS since 1982. Also, the British Sky broadcasting Company has been broadcasting into the United Kingdom successfully from Luxembourg and Star TV, a Hong Kong-based company, broadcasts over most of Asia. He added that several DBS operators are ready to begin service in the United States.

Much like DBS developments, other forms of wireless communications which carry not only voice but other forms of electronic communication (fax, electronic mail, etc.) also seem to be driven by new technology, free enterprise and the demand for services. According to Larsen, the same appears to hold true for remote sensing satellites which are employed to locate natural resources and gather valuable economic information in foreign sovereign territories. In the United States remote sensing data is sold by EOSAT, a private commercial company which competes with SPOTIMAGE, a French commercial company. Neither of these companies have been restricted significantly in their business activities by claims that the sovereignty of sensed States have been violated. All these examples appear to indicate that the traditional concept of sovereignty has been diminished by these recent technological advances.

The wide scope of coverage of relevant issues presented in the panel

discussion was appreciated by the audience as indicated by comments from the floor which concluded the session.

Stephen Gorove
Chairman

ASIL Interest Group on International Space Law

Space-Related Legislative Initiatives and Policy Developments

For the purpose of updating its membership on important space law and policy developments, the *American Institute of Aeronautics and Astronautics (AIAA)* Legal Aspects Committee ("Committee") held its Annual Meeting in Washington, D.C., on May 4, 1994. Speakers at the meeting included government officials responsible for shaping space policy, as well as other guests and Committee members.

After a brief introduction by the Committee's chairman, *William English*, the program began with a comprehensive and very interesting overview of space-related legislative initiatives, provided by *Elaine David*, who now serves as counsel to the House Subcommittee on Space. Ms. David informed us that the NASA Authorization bill (H.R. 2200) for Fiscal Years (FY) 1994 and 1995 still has not passed the Senate, and she was pessimistic about the prospects for passage. Nonetheless, she noted, an Appropriations Act for NASA was passed for FY 1994.

Although the entire H.R. 2200 may never pass, said Ms. David, pieces of it probably will. For example, an amendment to the Commercial Space Launch Act of 1984 (49 U.S.C. §§ 2601-2623), which would broaden the authority of the Department of Transportation's Office of Commercial Space Transportation ("OCST") to allow for the licensing of reentry vehicles, could be incorporated into and passed as part of another bill. Ms. David also made note of several other legislative initiatives, among them a bill to be introduced by Congressman Joel Hefley (R-CO), which would provide for the establishment of a U.S. launch services corporation modeled on the Communications Satellite Corporation.

Scott Pace, formerly Director (Acting) of the Department of Commerce's Office of Commercial Space, and now with Rand Corporation, provided a terrific update on recent developments in remote sensing policy. On March 9, 1994, he said, the Department of Commerce ("DOC") finally announced the Administration's new policy on commercial satellite remote sensing, thereby paving the way for the long-awaited licensing of remote sensing satellite operations proposed by Lockheed Corporation and a venture comprising Orbital Sciences Corporation, Litton ITEK, and GDE Systems. The policy permits commercial satellite operators to provide satellite imagery with one-meter resolution, and thus allows U.S. companies to compete in what may become a major commercial space market.

Gerald Musarra, Washington Counsel and Director of Commercial Programs for Lockheed Missiles and Space Company, informed the group that his company received a satellite remote sensing license from DOC's

National Oceanic and Atmospheric Administration on April 22, 1994, an event also noted by Dr. Pace. Mr. Musarra discussed some of the conditions imposed upon Lockheed under the license, among which is that the licensee may have to limit data collection and distribution under certain circumstances where U.S. national security interests are at stake.

Speaking next on the use of excess ballistic missiles for space launches, *Marc Johansen* from the White House's Office of Science and Technology Policy ("OSTP"), offered general comments on the ongoing review of this issue by his office. "Excess missiles," said Mr. Johansen, refers to those missiles which will have to be dismantled in order for the U.S. and Russia to comply with the Treaty Between the United States and the Union of Soviet Socialist Republics on the Reduction and Limitation of Strategic Offensive Arms July 31, 1991 ("START I Treaty"). (The Lisbon Protocol of May 23, 1992, makes the treaty applicable to Russia, Kazakhstan, Ukraine, and Byelarus).

Mr. Johansen said the announcement of a government policy on the use of U.S. excess missiles (Minuteman IIs) is imminent. The policy is likely to restrict the use of excess missiles, and will reflect an attempt to balance the interests of those parties who have advocated the virtually unrestricted release of government excess missile assets to the private sector, on the one hand, and of those, for example, the existing U.S. launch providers, who argue that the unrestrained use of these missiles would destroy a fledgling commercial launch industry and impede technological development, on the other hand.

Following up on Mr. Johansen's presentation, *Pamela Meredith*, a Washington, D.C., attorney, discussed restrictions on the use of *foreign* excess ballistic missiles imposed by the Missile Technology Control Regime (MTCR) of 1987 and the START I Treaty. She noted that the Russian SS-25 missile, now being offered for commercial launch services, falls within the ambit of the MTCR, a legal regime (but not a treaty), which requires partner states to restrict, but not prohibit, exports of missiles and missile technology. The SS-25 also is subject to locational and numerical restrictions under the START I Treaty, she said.

On another subject, Ms. Meredith noted that, for the first time, this year, orbital debris was considered by the Scientific and Technical Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS). She said the U.S. continues to oppose consideration of orbital debris by the COPUOS Legal Subcommittee -- for fear of a treaty or resolution that would impose stringent requirements on spacecraft design and operation. Ms. Meredith also discussed briefly the accomplishments of the AIAA Committee on Orbital Debris, which she co-chairs.

Mr. Richard Scott spoke on the subject of space launch trade, which counts among his many responsibilities as OCST's Associate Director for Commercial Space Policy and International Affairs. He touched upon some of the problems encountered in the enforcement of the pricing clause of the Agreement Between the Government of the United States of America and the

Government of the Russian Federation Regarding International Trade in Commercial Space Launch Services, signed September 2, 1993 ("Trade Agreement"). Under this agreement, as a condition of entry into the world commercial launch market, the Russians agreed to price their launch services within 7.5% of the lowest Western bid.

Also, concerned that the Russians might circumvent the quota limitation imposed by the Trade Agreement, said Mr. Scott, the United States Trade Representative, on March 10, 1994, issued a Notice (59 Fed. Reg. 11360) clarifying the U.S. position that commercial leasing of Russian-launched satellites in-orbit counts against the quota. (The Trade Agreement limits to eight the number of geostationary satellites the Russians may launch before year 2001). Satellite leasing was not explicitly covered under the agreement, said Mr. Scott. He also noted that the 1989 launch trade agreement with China will expire at the end of this year, but that the U.S. has not decided whether to renew or renegotiate. Launch trade talks with the Europeans are on hold, he said, pending a determination by the Europeans as to who should be the U.S. counterpart in the talks, the European Union or the European Space Agency.

Daniel Cassidy, Director of Sedgwick Space Services, commented on the state of the space insurance market. He said launch insurance capacity in the market today (*i.e.*, the sum underwriters are willing to commit per launch event) is in the range of \$400-500 million. The insurance market consists of underwriters in Europe (56%), the U.S. (21%), and other countries (23%), said Mr. Cassidy. In the European market, Lloyds of London and Italy's Assicurazione Generali are the dominant players, he noted, with capacities, respectively, of about \$80 million and \$60 million; in the U.S., International Technology Underwriters (INTEC) and U.S. Aviation Insurance Group (USAIG) are market leaders, with approximately \$50 million each.

Speaking on spacecraft export policy, *Dennis Burnett* of Haight, Gardner, Poor & Havens mentioned that, in the past year, regulations were finalized which served to move communications satellites to the Commerce Control List under DOC's jurisdiction from the Department of State's Munitions List. The move will result in a less burdensome licensing review, said Mr. Burnett. He further noted that the export to China of communications satellites and component parts on the Munitions List will continue to be difficult, and will depend on China's compliance with the MTCR, as well as on China's cooperation with the U.S. on matters involving human rights and sanctions against North Korea.

Janice Bellucci of Law Offices of Janice Bellucci enlightened the group on recent policy initiatives in the area of space transportation. She noted that OSTP is close to completing a review of U.S. launch policy options, and she provided copies of the draft of the national space policy directive which will emerge from the OSTP review. Ms. Bellucci discussed briefly the launch policy options that have been considered by the OSTP, which range from upgrading of current expendable launch vehicle technology, to development of a government-funded, single-stage-to-orbit

launch system involving "leapfrog" technologies.

William C. Anderson, Senior Patent Attorney, The Boeing Company, Washington, summarized NASA's High Speed Research (HSR) Technology Transfer Plan. The Plan is embodied in NASA's "Limited Exclusive Rights (LER) Data" clause of January 1992 which is usually made part of NASA's contracts for High Speed Research. The LER Data clause grants NASA a "governmental purpose license" in selected data first produced by a contractor under those HSR contracts and the option to direct the contractor to license "U.S. Persons." Those licensees and the original contractor enjoy "limited" or non-exclusive commercial rights in the LER Data but must not disclose the LER Data outside the U.S. or to non-U.S. persons without the permission of NASA. LER Data is protectable for at least five (5) years and is considered the proprietary, confidential, and/or trade secret information of the original contractor. (Mr. Anderson submitted this paragraph in writing for purposes of publication in the Journal).

Completing what turned out to be a very successful Annual Meeting, *William English*, who is General Counsel of Iridium, Inc., gave a status report on the Federal Communications Commission's ("FCC") ongoing rulemaking and licensing proceedings for "big" low-Earth orbit ("LEO") satellites. On February 18, 1994, he said, the FCC released a Notice of Proposed Rulemaking, setting forth specific proposed criteria for licensing of the big LEO applicants and suggesting a frequency sharing arrangement. Comments on the FCC's Notice, he said, were due on May 5, 1994. Mr. English said he believed all of the applicants were concerned that failure to come to agreement on a frequency sharing scheme might lead the FCC to call for a frequency spectrum auction. He predicted that the FCC should be in a position to license qualified big LEO applicants by year-end 1994 or shortly thereafter.

Pamela L. Meredith,

Member, AIAA Legal Aspects Committee

William D. English,

Chairman, AIAA Legal Aspects Committee

United Nations Committee on the Peaceful Uses of Outer Space Holds Annual Meeting in Vienna, Austria

I. Introduction

The United Nations Committee on the Peaceful Uses of Outer Space held its thirty-seventh annual session at the United Nations Office at Vienna, Austria, from 6 to 16 June 1994. The Committee, under the Chairmanship of *Ambassador Peter Hohenfellner* of Austria, continued its consideration of questions relating to international cooperation in outer space activities. As has been the trend in recent years, Member States continued their discussions on how to best facilitate international cooperation, particularly between developed and developing countries. To this end, during the general exchange of views, many States discussed

plans currently under way or in development, designed to further enhance the spirit of cooperation between all States for the benefit and in the interest of all countries of the world.

As in previous years, the principal items on the agenda of the Committee were the consideration of the work of its two Subcommittees, the Scientific and Technical Subcommittee¹ and the Legal Subcommittee.² The Committee also considered the items "ways and means of maintaining outer space for peaceful purposes" and "spin-off benefits of space technology."

With regard to the item, "ways and means of maintaining outer space for peaceful purposes", the members of the Committee firmly believed that developments that would strengthen the role of the Committee in maintaining space for peaceful purposes should continue. The Committee had responsibilities relating to the strengthening of the international basis for the peaceful exploration and uses of outer space. The Committee agreed that a good way to broaden international cooperation in outer space was through international and regional programmes.

With regard to the item of spin-off benefits of space technology, the Committee agreed that spin-offs of space technology were yielding substantial benefits in many fields.³ It noted the importance of international cooperation in the development of spin-off benefits of space technology and in ensuring that all countries, particularly developing countries, had access to those benefits. The Committee again recommended that the Space Applications Programme devote at least one of its training courses, seminars, or expert meetings each year to the promotion of spin-off benefits from space.

II. United Nations Programme on Space Applications

In considering the work of the Space Applications Programme, the Committee expressed its satisfaction with the Programme as implemented by the United Nations Office for Outer Space Affairs. The Committee however, expressed its concern over the limited financial resources available for carrying out the Programme and appealed to Member States to support the Programme through voluntary contributions. The Committee also approved the proposed program for 1994, including training courses, workshops, symposia, and regional conferences on various subjects, for

¹ This Subcommittee held its thirty-first session in Vienna from 21 February to 3 March 1994 under the Chairmanship of Mr. John H. Carver (Australia). The report of the Subcommittee was issued as doc. A/AC.105/571.

² The Legal Subcommittee held its thirty-third session in Vienna from 21 March to 5 April 1994 under the Chairmanship of Mr. Vaclav Mikulka (Czech Republic). The report of the Subcommittee was issued as document A/AC.105/573 and the summary records of the meetings of the Subcommittee are contained in docs. A/AC.105/C.2/SR.572-579.

³ For example, new techniques for the field of industrial measurement and control, image and data processing, medical techniques, computer systems, robotics, power generation, special materials and chemicals, water treatment and refrigeration.

persons from developing countries, and fellowships for qualified applicants for advanced study in the area of space science and technology and space applications. The Committee also noted that the Programme was continuing its technical advisory services to various governments for various international and regional activities. Finally, the Committee noted with satisfaction that many countries had expressed an interest in hosting regional centres for space science and technology education. To that end, the Committee noted with satisfaction that the Governments of Brazil and Mexico had concluded negotiations for the establishment of a Centre for the ECLAC⁴ region.

III. Use of Nuclear Power Sources in Outer Space

The Committee noted that Principle 11 of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space⁵ stated that the Principles should be reopened for revision by the Committee no later than two years after their adoption. The Committee agreed that the Principles should remain in their current form until amended and that before amendment, proper consideration should be given to the aims and objectives of any proposed revision. The Committee also agreed with the recommendation of the Legal Subcommittee that consideration of the Principles by the Working Group within that Subcommittee should be suspended for one year, pending the results of the work in the Scientific and Technical Subcommittee, without prejudice to the possibility of reconvening the Working Group if, in the opinion of the Legal Subcommittee, sufficient progress was made in the Scientific and Technical Subcommittee at its 1995 session to warrant such a reconvening. The Committee endorsed the recommendations of both its Subcommittees that the item on nuclear power sources should be retained on their respective agendas for their sessions in 1995.

IV. Space Debris

The Committee noted with satisfaction that, after many years of discussion, the subject of space debris had been included in the agenda of the Scientific and Technical Subcommittee. The Committee agreed that consideration of space debris was important and that international cooperation was needed to evolve appropriate and affordable strategies to minimize the potential impact of space debris on future space missions. The Committee also noted that it was important that Member States pay more attention to possible collisions of orbiting space objects, including those with nuclear power sources on board, with space debris, and other aspects related to space debris. The Committee agreed that there was a need for further research concerning space debris and agreed with the Scientific and Technical Subcommittee that it was important to have a firm

⁴ Economic Commission for Latin America and the Caribbean.

⁵ Adopted by General Assembly resolution 47/68 of 14 December 1992.

scientific and technical basis for future action on the complex attributes of space debris. The Committee also agreed that the Subcommittee should, *inter alia*, focus on understanding aspects of research related to space debris. These could include debris measurement techniques, mathematical modeling of the debris environment, characterization of the space debris environment and spacecraft design measures to protect against space debris. The Committee also agreed that the Subcommittee, at its next session, should develop a specific multi-year plan for its work on this agenda item.

V. Definition and Delimitation of Outer Space and the Character and Utilization of the Geostationary Orbit.

The Committee continued its consideration of the agenda item concerning the definition and delimitation of outer space and the character and utilization of the geostationary orbit. The Committee noted that a variety of views had been expressed on the definition and delimitation of outer space. Some Member States felt that a conventionally defined boundary between air space and outer space was needed and that the Legal Subcommittee should continue to consider the question with a view to establishing such a boundary. Other Member States stated that the need for such a definition or delimitation had not yet been established; attempts to prematurely establish a boundary between airspace and outer space might complicate and impede progress in the peaceful exploration and use of outer space. A draft questionnaire concerning aerospace objects,⁶ along with an informal paper which contained an introduction for the draft questionnaire prepared by the Chairman of the Working Group on this item, were also further discussed by the Working Group. The Committee noted that both documents could form a suitable basis for future discussions.

The Committee noted that a productive exchange of views had taken place on the working paper, "Geostationary satellite orbit", submitted by Columbia to the Working Group in 1993⁷ and that this exchange could also

⁶ "Informal paper by the Chairman of the Working Group (Doc. A/AC.105/C.2/1993/CRP.1 of 29 March 1993): Draft questionnaire concerning aerospace objects", reproduced as an Appendix to the report of the Working Group on agenda item 4 (Annex II). See A/AC.105/544 of 15 April 1993, the Report of the Legal Subcommittee on the work of its thirty-second session, at pages 20-21. The legal questions raised in the paper deal, *inter alia*, with the definition of aerospace objects, the passage of space objects over foreign territory during their re-entry into the Earth's atmosphere, the question of the application of air law to aerospace objects, and the registration of aerospace objects. The questionnaire draws on and expands the working paper entitled, *Questions concerning the legal régime for aerospace objects*, submitted by the Russian Federation during the 1992 session of the Legal Subcommittee: See doc. A/AC.105/C.2/L.189 of 30 March 1992, reproduced in doc. A/AC.105/514 of 20 April 1992, Report of the Legal Subcommittee on the Work of its thirty-first session, at pages 48-49.

⁷ See doc. A/AC.105/C.2/L.192, of 30 March 1993, reproduced in docs.

provide a good basis for future discussions on the subject. Some Member States reiterated the view that the geostationary orbit, because of its particular characteristics, required a special, *sui generis*, legal regime to regulate access and utilization by all States, taking into account the needs of developing countries. Other Member States thought that the International Telecommunications Union (ITU) was the appropriate body to effectively address the question of regulating the use of the geostationary orbit. Some delegations also thought that the subject of the geostationary orbit and definition and delimitations of outer space should be considered separately while others thought that, because of their historical links, these issues should continue to be considered jointly. The Committee also recognized that space debris was a cause for concern in the geostationary orbit as well as in lower orbits.

VI. Outer Space Benefits

The Committee again considered the work accomplished during the Legal Subcommittee on the subject of outer space benefits. The Committee noted that the Working Group had continued its consideration of a working paper, "Principles regarding international cooperation in the exploration and utilization of outer space for peaceful purposes",⁸ sponsored by several Member States.⁹ The discussions that took place this year were very constructive and included many substantive comments that allowed the sponsors of the working paper to better gauge the attitude of many Member States towards this document. Several delegations thought that it was essential to have legal principles that would ensure that all countries have access to, and benefit from, outer space activities. Other delegations felt that any set of principles should address the inequalities existing between the technologically advanced space nations and the developing countries without the infrastructure, resources and technological capability to benefit from space exploration and utilization. Still other delegations questioned whether there was a need to elaborate principles such as those proposed in the working paper because, in their view, there was sufficient international cooperation in the peaceful uses of outer space and that these principles would limit the sovereign right of a State to choose with whom, and in what form, it could conduct cooperative activities, and would also limit the extent of ongoing cooperation.

A/AC.105/544 and A/AC.105/573, being the reports of the Legal Subcommittee's 1993 and 1994 sessions, respectively.

⁸ See doc. A/AC.105/C.2/L.182/Rev.1, of 31 March 1993, reproduced in docs. A/AC.105/544 and A/AC.105/573, being the reports of the Legal Subcommittee's 1993 and 1994 sessions, respectively.

⁹ Argentina, Brazil, Chile, Colombia, Mexico, Nigeria, Pakistan, Philippines, Uruguay and Venezuela. Egypt and Iraq added their names to this list, in this year's session of the Legal Subcommittee.

VII. The Question of Review and Revision of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies.

Article 18 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies¹⁰ requires that 10 years after the entry into force of the Agreement,¹¹ the question of its review should be included in the provisional agenda of the General Assembly so that the Assembly might consider, in light of past application of the Agreement, whether it required revision. One Member State felt that since the Agreement had been ratified by only nine Member States and signed by five others,¹² any possible revision of the provisions of the Agreement should be conducted with prudence and only on the basis of consultations with all Member States. The Committee recommended that the General Assembly, at its forty-ninth session, in considering whether to revise the Agreement, should take no further action at that item.

VIII. Unispace III

The Committee again considered the possibility of convening a Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space.¹³ This year, on the basis of discussion and debate, the Committee agreed that a third UNISPACE conference could be convened in the near future and also agreed that prior to recommending a date for such a conference, there should be a consensus recommendation on the agenda, venue, and funding of the conference. Therefore, in light of this recommendation, the Committee thought that a very thorough analysis and definition of an agenda for a third UNISPACE conference should take place at the next Scientific and Technical Subcommittee meeting. During the

¹⁰ Annexed to General Assembly resolution 34/68, of 5 December 1979. See also 1363 U.N.T.S. 3ff and 18 I.L.M. 1434ff.

¹¹ The Moon Agreement entered into force on 11 July 1984.

¹² Ratifications: Australia, Austria, Chile, Mexico, Morocco, Netherlands, Pakistan, Philippines and Uruguay; Signatures: France, Guatemala, India, Peru and Romania. See doc. A/AC.105/572 and Corr. 1, "United Nations Treaties and Principles on Outer Space" of March 1994.

¹³ The First United Nations Conference on the Exploration and Peaceful Uses of Outer Space was held in August 1968 in Vienna. It was conceived not only as a meeting for exchanging information on a global scale but also for examining the practical benefits of space exploration and the opportunities available for international cooperation with special reference to the needs of developing countries. In view of the rapid progress of space exploration and technology following this Conference, a second conference - UNISPACE 82 - was convened, also at Vienna, in 1982. Its purpose was to exchange information and experience on relevant developments in space and to assess such developments and the adequacy and effectiveness of institutional and cooperative means for realizing the benefits of space technology: See doc. A/AC.105/521, "Space Activities of the United Nations and International Organizations" (September 1992), at 9-10.

next session of the Scientific and Technical Subcommittee, discussions should take place on a broad range of themes and subjects which could be refined into a sharply focused and detailed agenda for a third UNISPACE conference. These discussions should provide the basis for a prompt decision by the Committee on a recommendation to the General Assembly regarding the agenda, timing, funding, organization and venue of a third UNISPACE conference. As far as venue is concerned, which has yet to be decided, the delegation of India again offered to host a third UNISPACE conference at the Indian Space Centre at Bangalore.

IX. Membership in the Committee

Since its inception in 1959, the Committee has expanded its membership several times. Currently, the Committee is made up of 53 Member States. Portugal and Spain, and Greece and Turkey, are permanent members on a three-year rotational basis. During this session, the Committee agreed to a limited enlargement of its membership. The Committee agreed, however, that the expansion should be limited to eight Member States. The Committee also agreed that, on the basis of recommendations made by various interested regional groups and subject to consensus of Member States of the Committee, the President of the General Assembly should appoint eight Member States to be added to the Committee at the forty-ninth session of the Assembly. The Committee was of the view that, after its current enlargement, there would be no need to further expand its membership in the near future until a comprehensive and thorough assessment was made on the impact of enlargement on the efficiency of its work.

Matthew W. Sanidas & Jitendra S. Thaker
Legal Affairs Officers
U.N. Office for Outer Space Affairs

Case Notes

*Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corporation (COMSAT)**

This Note assumes familiarity with the previously summarized facts and holding of the Court of Appeals in 20 J. SPACE L. 78. Briefly, the Plaintiffs, Alpha Lyracom Space Communications, Inc. and Pan American Satellite, collectively referred to as "PanAmSat," who are the owner and operator of the first international commercial communications satellite outside of INTELSAT, brought suit alleging that COMSAT, through INTELSAT and in conjunction with other signatories, engaged in a variety of anticompetitive practices in the market for international commercial satellite telecommunications services. The District Court for the Southern District of New York granted COMSAT's motion to dismiss in 1990 on the

* 1993 U.S. Dist. LEXIS 3825.

finding that COMSAT was immune from suit and legal process for its acts as a signatory to INTELSAT. Although the Court of Appeals upheld this finding, it reversed and remanded the case to allow PanAmSat an opportunity to "allege specific aspects of COMSAT's conduct as common carrier that are actionable under the antitrust laws," but specifically cautioned against any effort to dress up "Signatory" allegations in the language of "common carrier" allegations.

PanAmSat responded to the Appeals Court mandate by amending the core allegations of their complaint in a manner that either omitted reference to INTELSAT altogether, or, at the very least, distanced COMSAT's alleged acts as much as possible from its capacity as signatory to INTELSAT. For example, in the allegation that COMSAT has monopolized "and/or conspired to monopolize with others" the international commercial satellite telecommunications services market, PanAmSat's amended complaint deletes three references to "other INTELSAT signatories" as those who have conspired with COMSAT to monopolize, and also adds the following sentence: "All of this conduct has been undertaken by COMSAT outside of its capacity as United States signatory to INTELSAT."

In this remand, COMSAT principally argues that PanAmSat's amended complaint fails to distinguish between COMSAT's signatory conduct and its common carrier role. COMSAT points to plaintiffs' mere deleting of INTELSAT references and insertions of simple disclaimers that proclaim that the material actions described are independent of INTELSAT or within COMSAT's role as a common carrier. Ultimately, COMSAT contends that all of the actions alleged by the plaintiffs are either performed as a signatory or are so intertwined with its signatory duties that they are virtually indistinguishable.

The Court rejected COMSAT's argument, holding that PanAmSat has shown that they only seek redress for COMSAT's acts as a common carrier. In the court's view, a standard that required sharper distinctions between COMSAT's roles as a common carrier and an INTELSAT signatory at this stage would inappropriately transform this motion to dismiss into a motion for summary judgment. Hence, the present suit will now proceed to the discovery phase, which is "designed to provide whatever additional sharpening of the issues may be necessary."

Michael A. Gorove*

Smith v. United States ** & *Hughes Aircraft Co. v. U.S.* ***

After Smith's husband was killed in Antarctica while he was working under contract to a federal agency, Smith filed this wrongful death action against the United States under the Federal Tort Claims Act (FTCA). The FTCA's foreign-country exception states that the statute's

* Boston University School of Law.

** 113 S. Ct. 1178 (1993).

*** 29 Fed. Cl. 197 (1993).

waiver of sovereign immunity does not apply to "any claim arising in a foreign country." Hence, the issue presented was whether Antarctica, a sovereignless region that is frequently analogized to outer space, is a "foreign country" within the meaning of the FTCA.

In the Supreme Court's view, the phrase "foreign country" includes Antarctica, even though it has no recognized government. The Supreme Court justified its holding on both the structure of the FTCA itself as well as long-standing presumptions against extraterritorial application of Acts of Congress.

First, if Antarctica were not a "foreign country", then the FTCA - which waives sovereign immunity for torts committed "under circumstances where the United States, if a private person, would be liable . . . in accordance with the law of the place where the act or omission occurred" - would instruct courts to look to the law of a place that has no law in order to determine United States' liability, an inherently bizarre result. Similarly, if Antarctica were not a "foreign country", then the FTCA provision which provides that claims may be brought "only in the judicial district where the plaintiff resides or wherein the act or omission complained of occurred" would have the anomalous result of limiting venue to cases in which the claimant resides within the United States. These peculiar results, coupled with the presumption against extraterritorial application of U.S. statutes unless there exist affirmative evidence of congressional intent to the contrary, led the court to conclude that Antarctica is a "foreign country" within the meaning of the FTCA, thereby barring Plaintiff's wrongful death complaint for lack of subject-matter jurisdiction.

Justice Stevens - the lone dissenter - emphasized the profound importance of the issue at hand, stating that the negligence alleged in this case "will surely have its parallels in outer space as our astronauts continue their explorations of ungoverned regions far beyond the jurisdictional boundaries that were familiar to the Congress that enacted the . . . [FTCA] in 1946." Fueling his dissent was the fact that at the time it was enacted, the FTCA waiver of sovereign immunity extended to the sovereignless reaches of the high seas. In Stevens' view, the "geographic scope of that waiver has never been amended," thereby making the Government's position that the waiver is confined to territory under the jurisdiction of the United States completely unfounded.

Justice Stevens' observation that the majority holding "will surely have its parallels in outer space" has since been legitimated, although outside the realm of tort law, in a recent Federal Claims Court decision. In *Hughes Aircraft Company v. U.S.*, Hughes brought an action pursuant to 28 U.S.C. §1498 seeking just compensation for the unauthorized use or manufacture by or for the government of spacecraft containing an embodiment of a patented apparatus. The aforementioned section contains a provision similar to that found in the FTCA, stating that §1498 "shall not apply to any claim arising in a foreign country."

The *Hughes* Court stated that this provision, by itself, does not

prevent the application of §1498 to activities in outer space, because outer space is not a "foreign country" in the ordinary meaning of that phrase. However, citing the *Smith* Court interpretation of the similar provision in the FTCA, the *Hughes* Court felt constrained to limit §1498 to activities in this country only. Citing Stevens' dissent in the *Smith* holding, the Court stated that "*Smith* also prevents the assertion of §1498(a) over claims arising in outer space." Hence, the *Hughes* court held that §1498 does not apply to activities in outer space and therefore confined their analysis to activities occurring only within the territorial limits of the United States.

Michael A. Gorove*

Short Accounts

Implementation of the ESA Convention - Lessons From the Past

An International Colloquium on The Implementation of the ESA Convention - Lessons From the Past, was held in Florence, October 25-26, 1993, organized by ESA/ECSL (European Space Agency/European Centre for Space Law) and EUI (European University Institute). It consisted of four sessions dealing with the past, present and future of the ESA Convention. The Colloquium was intended not only for an audience which had followed and collaborated in the evolution of the ESA Convention but also for those who had an interest in this aspect of the Agency's development. As such, it presented the main issues raised by the Convention both from a historical and a prospective point of view and gathered more than a hundred experts and representatives of international bodies operating in this field, permitting a highly technical exchange of views among participants and speakers.

Prof. *Reimar Lüst*, President of the Alexander von Humboldt Foundation, opened Session I "The birth and evolution of the ESA Convention."** stressing the permanent need for a coherent European space policy. He was followed by *John Krige*, historian of EUI, Florence, who traced the drafting process of the Convention, which reflects the experience and patterns of thinking of the seventies. Then above all, it was sought to make ESA an even stronger instrument of European industrial policy and to harmonize national and European space programs more closely with one another. The important provision for optional programs carried out in parallel with the mandatory scientific program was meant to make it possible that potential users of applications satellites be involved in program planning from the very start.

Gabriel Lafferranderie, Chairman of ECSL, Paris, indicated the essential features characterizing the optional programs and explained the reasons why ESA was in great part sustained by them. A detailed analysis

* Boston University School of Law.

** Doc. EUI 297/93 (Col. 46).

of the pertinent provisions was followed by the discussion of various problems which arise during the realization of these optional programs. As a result rethinking and eventual modification of Art. V. 1b and Annex III might become urgent.

Concluding Session I, *Reinhard Loosch*, Head of EUREKA Secretariat, Brussels, commented on the decision-making and voting within ESA, giving particular consideration to the assignment of powers, the practice in their exercise and the basic trends under terms of the Convention.

Session II concerning "The geographical return" was introduced by *Winfried Thoma*, Head of ESA Contracts Department, Paris, who explained the rules of the Convention on industrial policy and the resulting conflicts among the various objectives: competition, worldwide competitiveness, specialization and industrial return. Furthermore, he pointed out the potential conflicts with the European Community (EC) caused by the development in the industrial return requirements decided by the ESA members.

The following paper presented by Prof. *Hans W. Micklitz*, Berlin School of Economics, considered the compatibility or contradictions existing between the ESA Convention and European Community Regulations especially after the completion of the Internal Market. In his opinion, the ESA procurement rules interfere with the Common Commercial Policy, for which reason the ESA Convention should be re-negotiated. The power to enter into such negotiations, Prof. *Micklitz* believes, might be shifted from the EC Member States to the Community.

Daniel Sacotte, Counselor to the President of CNES, examined the ESA rules from a national perspective dealing with the particular position held by the French space industry in Europe, whereas *Michel Praet*, Adjunct General Director of ALCATEL ETCA, questioned whether industrial return, industrial policy and competitiveness were reconcilable objectives.

Session III having as its subject "Commercialization - from Independence to Integration" was made up of five papers discussing this rather new phenomenon from several aspects.

Charles Bigot, President and Director General of ARIANESPACE, opening the session stressed the two main objectives to be pursued from the launchers point of view: regularity and rentability. In his opinion, commercialization should primarily promote the realization of the independence of European space activities, which only a persistent policy of solidarity preferring ARIANESPACE to other space enterprises, could achieve.

Jean Grenier, Director General of EUTELSAT outlined the history of the European efforts in the field of communications satellites. In describing the relationship between EUTELSAT and ESA, he attempted to draw conclusions and to learn lessons for the future.

John Morgan, Director General of EUMETSAT, giving information on the European Organization for the Exploitation of Meteorological Satellites, its history and activities, pointed out that EUMETSAT, in close cooperation

with ESA, has become an important contribution to the global system of meteorological satellites.

Gerard Brachet, Chairman of SPOT IMAGE, Toulouse, made it clear that the lack of concern for potential commercial utilization of space systems in the ESA Convention led necessarily to the commercial distribution of data obtained by earth observation from space by SPOT IMAGE. He said changes and updating in the ESA Convention will be needed and announced that prospects for these changes and suggestions to implement them are already under discussion.

Jürgen K. von der Lippe, Managing Director of INTROSPACE, Hannover, analyzed the possibilities of utilizing the microgravity environment for the production of new materials and research. Both processing and manufacturing in space are still limited by the excessive cost. Single missions infrequently performed can not supply the data needed to make microgravity a useful tool for research programs. Microgravity, *von der Lippe* argued, should not be considered as a space program, but as an element needed in many important research fields. Production of new materials under microgravity conditions, however, could at present not be identified.

The concluding Session IV concerned "The Agency and the evolution of the international environment."

Vladimir S. Vereshchetin, Russian Academy of Sciences, Moscow, opened the Round Table discussion and commented on the changing structure of the political relations in the world and its influence on the patterns of international space cooperation. Prof. *Vereshchetin*, considering the newly created Russian Space Agency fully responsible for the implementation of the 1990 Agreement between the former Soviet Union and ESA, felt certain that a number of new agreements between ESA and the Russian Space Agency on important space initiatives (manned space infrastructure, flight to Mars in 1994, space transportation systems) will be signed in the near future.

Jean Arets, Head of the International Affairs Branch of ESA, spoke of ESA as the best accomplished example of international cooperation in space on the European level (while other similar efforts with non-European countries have been less successful). ESA enjoying long experience in cooperation with NASA recently has had to face difficulties with the Space Station Program due to a non-equal partnership. The perspective of Cooperation-operation with Russia appears promising provided that both sides will make efforts in innovation. Contacts with Japan should be intensified since both partners are in comparable situations in regard to space activities.

Peter Creola, Chairman, Long Term Space Policy Committee, ESA, saw a new type of Cooperation-operation following the deep changes in the geopolitical environment coupled with world-wide economic stagnation becoming necessary. A thorough assessment of future space plans and options, he meant, would be inevitable.

Michele Paillon, Head of Division "Space" DG XII EC, Brussels,

recognized the importance of cooperation in space among European countries for the integration process on the whole and its contribution for the socio-economic development within EC. In consideration of this positive influence, EC intends to be more active in the field of European space programs and will create among other favorable conditions for the market of applications satellites and thus promote the expansion of European space policy.

Kenneth S. Pedersen, Research Professor of International Relations, Georgetown University's School of Foreign Affairs, gave - with the final paper presented in the Session - his perspective of the relations between ESA and NASA evaluating positively ESA's assistance to the American space programs, which ranged from sound technical and scientific counsel to the provision of major scientific instruments including Spacelab and Columbus. ESA, providing a single organizational point in Europe, also facilitated greatly negotiations leading toward sharing responsibilities for the implementation of U.S. - European space projects. For Prof. *Pedersen*, ESA is proof that, however difficult, a body of nations can pool their resources and collectively develop and implement a challenging array of space enterprises. Current conditions suggest that similar close collaboration among all space-faring nations of the world may be required to achieve the ambitious goals that lie ahead. In this respect, ESA is a pioneer in his view, and could in this context exercise valuable leadership for the benefit of all.

Elisabeth Back Impallomeni

Associate Professor of International Law
Department of International Studies
University of Padua, Italy

Asia Booms in Space!

The Eastern half of Asia is a booming area in terms of space activities, especially satellite telecommunications activities. More or less as a consequence thereof, it also is a booming area in terms of conferences, workshops, symposia and colloquia on space activities, including of course telecommunications activities. It was one of these conferences, the Asia-Pacific Conference on Multilateral Cooperation in Space Technology and Applications, held from January 14 through 18, 1994, in Bangkok, Thailand, that the present author was invited to visit and address.

The opening session on January 14 did already show the extent to which Asian states were interested in a diversity of space activities. Thus on this very first day some 150 speakers and participants were addressed by *Mr. Sombat Uthaisang*, Deputy Permanent Secretary of the Ministry of Transport and Communications of Thailand, *Mr. Rafeuddin Ahman* from Pakistan of ESCAP, *Mr. Hiroyasu Sonoki* from Japan of the Asia-Pacific Telecommunity and *Col. Wiani Sompong*, Minister of Transport and Communications of Thailand.

Then, in the first session, under the Chairmanship of *Dr. Suthi Aksornkitti* from Thailand, the so-called keynote addresses were

delivered by the official representatives of the most important Asian states that were in attendance. Here, *Mr. Uthaisang, Prof. Wang Liheng* of China, *Dr. George Joseph* of India, *Mr. Tsutomu Kubota* of Japan, *Mr. Jang Su Riyu* of Korea and *Mr. Sikander Zaman* presented the views of their respective states in general on the issue of multilateral cooperation, and those specific fields where cooperation was closest to their interests and their hearts. Thus, a first overview was given of those main projects which were ongoing or undertaken.

The next sessions on the 14th of January also focused, first and foremost, on those very projects. To this lawyer's ear, it was therefore sometimes bewildering to hear a large number of interesting projects pass scrutiny and discussion, but what became clear above all was that the general developments in the terms used were so political and so much in *statu nascendi* in character as to preclude any thorough legal discussion of the juridical aspects. For instance, *Mr. Kubota* gave an overview of the status and prospects of NASDA's activities, explaining such projects as the H-II Launch vehicle, and its launch of 2 tons into geostationary orbit this year, and an alternative project on J-I launch vehicle for low earth orbit payloads. As to international cooperation, the distribution of remote sensing data was *inter alia* a topic of discussion.

Likewise, *Dr. Joseph* gave an interesting update on Indian programs of the recent past, the present and the near future. He discussed the various INSAT satellites which serve a multitude of communication, broadcasting and meteorological purposes. Also noted was a third remote sensing satellite, IRS-1C, which is expected to be realized by the Indian space industry with a 6 meter (panchromatic) resolution.

As a final example, *Mr. Nasim Shah* of Pakistan presented a detailed proposal for a Asia-Pacific Multilateral Space Cooperation Organization (APMSCO), to be modeled especially after the European Space Agency. Realization of such an organization should be viable already at the turn of the century, with an ESA-style Authorization Board, a Council and a headquarters staff.

In the end, only two presentations were almost exclusively focusing on legal issues, and hence of potential interest to the present readers of the JOURNAL OF SPACE LAW. *Dr. Visoot Tuvayanond* of Thailand presented "Some Reflections on Contemporary Space Law." He discussed the various forms that space law could take, relating the respective conventions and resolutions to each other. Especially, he dwelt upon the issue of the binding nature of space law as it stood at present and as it was derived from the various sources.

The main part of the argument then went into some iniquitous aspects of space law, as perceived by the speaker, and how, in his opinion, they should be rectified to ensure more equitable sharing of benefits deriving from activities of man in outer space. His criticisms focused essentially on the fact that the principle of the freedom of outer space was in actuality so much snowed under by the enormous difference in space capabilities, that it had become almost a farce for most of the nations of

this world. Other, more specific legal measures were necessary to rectify this situation and create true possibilities for all states to benefit from outer space activities.

In this light, the issues of the sharing of the geostationary orbit by all states - and not just the happy few with the technology and the resources - and the measure of free utilization of information and data acquired through remote sensing satellites formed the main bones of contention. Specifically, if Third World countries were to benefit from space activities, and to be able to usefully and meaningfully participate in multilateral cooperation projects, special attention would ultimately have to be paid to the issues of broadcasting and copyright.

Finally, at the very end of the day, the present author on special request discussed, in the session with *Prof. Chen Fang-Yun* of China as chairman, the interesting proposals made by *Prof. H. A. Wassenbergh* in an article published in the *JOURNAL OF SPACE LAW*.^{*} Since launching obviously was a first requirement for all space activities, all present were interested in discussing Wassenbergh's proposals concerning "The Law Governing International Private Commercial Activities of Space Transportation."

Here, comparisons were made not only with air transportation law, and the Chicago Convention, but also with the United States Commercial Space Launch Act. The issues of liability and responsibility passed scrutiny, as did the question of competition and competition rules. The conclusion amounted to a proposal for a Multilateral Launch Transport Services Agreement, to be based on the definition of six launching freedoms along the lines of the freedoms of the air provided by air law. It was unfortunate that, because time was running short at the end of the day, only a very summary discussion of all these topics was possible.

Although the conference resumed three days later, the present author had to leave due to engagements elsewhere, and hence is unable to further report on the second part of the conference. One overriding impression had, however, already clearly emerged amidst all the ongoing discussions and varying presentations: the Asian-Pacific area is booming in terms of space activities just as much as it is booming in terms of conferences - or just as much as Bangkok is booming in other terms!

Frans G. von der Dunk
Co-Director

International Institute of Air and Space Law
Leiden University

Legal Questions Regarding Commercial Activities in Outer Space

The 33rd Session of the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space (COPUOS) took place in Vienna from March 21 to April 8, 1994 under the chairmanship of *Dr. Václav Mikulka* of the

* 21 J. SPACE L. 97-121 (1993).

Ministry of Foreign Affairs of the Czech Republic. As usual, a symposium was organized by the International Institute of Space Law (IISL) to be held during the session. The European Centre for Space Law (ECSL) acted as co-sponsor.

At the request of *Dr. Nandasiri Jansentuliyana*, President of IISL, *Dr. Ernst Fasan*, Honorary Director of IISL, was appointed co-ordinator, and the chosen topic for the symposium was "Legal Questions Regarding Commercial Activities in Outer Space."

With *Mr. Matthew Sanidas* serving as rapporteur and recording the event, the symposium took place on March 22, 1994 at the United Nations Office at Vienna (Vienna International Centre) and was attended by nearly all delegations present at the Legal Subcommittee's meeting.

In his welcoming address, *Fasan* pointed out that for many years the IISL has been honored by the possibility of having a symposium program presented to the delegates attending the Legal Subcommittee's session which this year, for the first time, took place in Vienna. He expressed his thanks to the Chairman for this opportunity and noted his particular pleasure about the possibility of welcoming the attendants in his own country. He indicated the topic of the symposium and, after an introduction of the four speakers, namely *Dr. Peter NESGOS* (USA), *Mrs. Valérie KAYSER* (France/ECSL), *Dr. Priyatna ABDURRASSYID* (Indonesia), and *Dr. Walter THIEBAUT* (Belgium/ESA), he gave the floor to the first speaker, *Dr. Peter Nesgos*. *Nesgos* spoke on "Commercial Space Law: Practical Examples Relating to Contracts, Insurance and Finance."

Nesgos indicated that the hallmark of space activities in the 1980s and 1990s is the increasing commercialization in space transportation, remote sensing, telecommunication, mobile and radio determination services and materials processings. Then he gave examples to demonstrate how international legal principles applicable to space intersect with practical commercial law in space-related business, and mentioned the auction by Sotheby's on December 11, 1993 in New York of a Lunokhod (Lunar Rover) which had been launched back in November 1970 to the Moon and was still there in Mare Imbrium. He quoted the legal disclaimer of liability used by Sotheby's in this regard. The object sold, according to his report, for US \$60,000

Nesgos also discussed third party liability arising from a failed launch and also referred to insurance problems. He gave the example of Arianespace's liability to the French Government in case of injury or damage caused by Ariane launchers in the amount of 400 Million French Francs. Discussing the insurance problems of this liability, he pointed out the growing concern of insurance industry with the increase of space debris, and drew attention to the financial aspects in connection with satellite launches and other space activities. In conclusion, he requested a dialogue among the aerospace industry and the insurance, finance, and legal communities.

The next speaker, *Valérie Kayser*, reported on "Private Involvement in Commercial Space Activities: Legal Issues and Recent Trends." She

started with the anecdote about Neil Armstrong's reaction immediately before lift-off and about his thoughts in those critical seconds: he thought about sitting on the top of 20,000 subcontracts, all at the lowest costs. Kayser then discussed how private ventures appear in the area of space exploration and exploitation and examined the impact that the space treaties, such as the Outer Space Treaty, the Liability Convention and the US Commercial Space Launch of 1984, *etc.*, have had on private enterprise. She noted the growing private involvement in the field of telecommunication services and remote sensing, and referred to the development of domestic laws, including the US Communication Satellite Act, the Land Remote Sensing Commercialization Act, and the Commercial Space Launch Act, and gave examples about liability arising out of private involvement in space business.

Kayser elaborated in detail on the Tonga Satellite Company case and discussed the recent activities to privatize certain international telecommunications organisations, like INMARSAT. Legal questions pertaining to aerospace carriers and problems of commercial mining interests versus rescue obligations on the Moon concluded her paper.

The third speaker, *Dr. Priyatna Abdurrassyid*, spoke on "The Road to an International Agreement on Commercial Utilization for Outer Space." He pointed out the importance of the legal status of outer space as set out in the Outer Space Treaty of 1967 and its history, followed by further outer space treaties and agreements, including the Moon agreement. He made a scientific study of the meaning of the word "Commercialization" and, in particular, discussed this term and its relation to the principles of "The Common Interest of all Mankind" and "The Common Heritage of Mankind." In connection with this, *Abdurrassyid* discussed articles 55 and 56 of the Charter of the United Nations together with the Report of the 13th Session of the Legal Subcommittee, New York, 1991.

In regard to developing countries, he pointed out the possible benefits of commercial space activities as follows: "Social improvement through the availability of better facilities such as telecommunications, television, weather forecasting, natural resources management through remote sensing, *etc.*.... [An] increase in the scientific knowledge about the Earth and its surroundings.... [An] increase in the study and application of better technology for their national reconstruction."

The last speaker, *Dr. Walter Thiebaut* spoke about "Aspects of Commercialization of Space Activities in Europe." He started with an overview of the former European Space Organisations - ESRO (Research) and ELDO (Launching) - which merged into the European Space Agency (ESA) in 1975.

Thiebaut discussed in detail the ESA Convention of May 30, 1975, and showed that ESA Member States rarely took advantage of the possibility of carrying out activities by way of the Agency, but rather used these articles to allow the Agency to give assistance to non-ESA Member States. He pointed out that Arianespace is a Company Ltd. under French Law, with shareholders from private industry and banks; it also includes CNES, as a

shareholder. He further elaborated on the OTS-satellite in the area of telecommunication. He then mentioned that EUTELSAT, which earns its income from the lease of transponders, and EUMETSAT, which provides a public service and, not being uniquely suited for privatization, must therefore be financed by public funds.

Thiebaut then discussed the impact of the Single European Act of 1987, such as the actions undertaken by the Commission and the ECSL in the area of Legal Protection of Remote Sensing Data. He recalled that in 1984 an American private Company, T.C.I. (Transpace Carriers, Inc.), which had obtained the commercialization of the Thor Delta Launcher, requested the U.S. Government to impose economic sanctions against Europe, alleging that Arianespace was being subsidized by the European Space Agency via its Member States. He further advised the audience about the negotiations of the Commission with ESA support, about Russia's entry into the worldwide competition among launch providers. Finally, he requested a clear legal environment, a task which, in his view, the European Union must conquer if it wishes to ensure that Europe's space activities remain at an appropriate level.

These four papers were followed by an interesting discussion. First, the matter of reconciliation between the necessary access to low cost technology for developing countries and the predominant trend toward commercialization was raised (*Mrs. Victoria S. Bataclan* of the Philippines and *Dr. Walter Thiebaut*). Then, *Mr. Maria Curia* of Argentina pointed out that the treaties on space law do not deal directly with commercialization or questions of liability insurance. Explanatory responses were given by *Dr. Peter Nesgos* and *Dr. Walter Thiebaut*. After that, *Dr. Fasan* expressed his appreciation to the speakers and the audience and, on behalf of IISL and ECSL, invited the attendants to an informal reception.

Dr. Ernst Fasan
Honorary Director, IISL

Congressional Notes

The NASA Authorization bill (H.R. 2200) for Fiscal Year (FY) 1994 still has not passed the Senate, only the Appropriation bill has, as reported in the last issue of the JOURNAL.* As to FY 1995, the House approved funding for the Space Station and Senate approval is not in doubt.

Executive Developments

On March 10, 1994, the Administration's new policy to allow for the commercial sale of remote sensing technology was announced. Under the new policy, U.S. companies will be licensed by the Secretary of Commerce to operate private remote sensing systems and sell those images

* See 103 P.L. 124; H.R.2491 (1993); 107 Stat. 1275; 21 J. SPACE L. 180 (1993).

to domestic and foreign entities. The export of the so-called "turn-key" systems will be considered on a case-by-case basis under an export license issued by the State Department. National security and international obligations will be protected through specific conditions in the license. The export of sensitive technologies will be considered on a restricted basis to protect advanced capabilities.*

A new national space policy directive has been under consideration to establish national policy guidelines and implementing actions for the conduct of the national space transportation program in order to sustain and revitalize the U.S. space transportation capabilities. The new directive would supersede several earlier national space policy and security directives.

International Developments

The size of the global telecommunication market was estimated at \$535 billion in 1992 according to a recent ITU report.

In July 1993, the legal issue of geostationary orbit slot ownership arose. Rimsat, licensed by Tongasat of the Pacific island nation Tonga (which was granted use of several slots by the ITU), moved its Gorizont satellite into the slot at 134° east longitude, already occupied by a Palapa spacecraft belonging to Indonesia's Pacific Satelit Nusantara. Subsequently, two satellite operators in the United States, PanAmSat and Columbia Communications Corporation, filed petitions with the FCC to take action against Tongasat for alleged slot use abuse.

Between July 15 and 17, 1993, the United States and the Russian Federation entered into three distinct agreements. The first covers commercial launches from the Russian Federation of satellites built in the United States or containing components made in the United States. The second relates to space shuttle and space station cooperation, and the third, which deals with curbing the proliferation of missile technology, stipulates that the Russian Federation will comply with the provisions of the Missile Technology Control Regime. The United States and the Russian Federation also sealed plans for a jointly run space station.

On August 20, 1993, the Russian Federation's Parliament passed a law defining the roles of the Russian Space Agency and the Russian Space Foundation in science, communications, navigation, and remote sensing. The law bans orbiting nuclear weapons, use of the Moon for military purposes, and deliberate pollution of space.

The terms of the agreement between the Russian Federation and Japan signed on October 13, 1993, provide for the establishment of a "Japan-Russia Joint Committee for Cooperation in Space."

On March 10, 1994, the U.S. established certain guidelines it intends to follow in implementing the agreement of September 2, 1993,

* For further details, see the Current Documents section in this volume of the JOURNAL.

between the United States and the Russian Federation regarding International Trade in Commercial Space Launch Services.*

Manfred Lachs Space Law Moot Court Competition

The finals of the third Manfred Lachs Space Law Moot Court Competition will be held in Jerusalem on October 13, 1994, between the University of Helsinki (Finland) and the John Marshall Law School in Chicago (USA). The finalists are the winners of the preliminary competitions which were held in the US and Europe. In the US seven teams participated and in Europe four teams took part. The 1994 problem relates to issues involving an international space station, intellectual property rights and liability for damage. Judges Guillaume, Herczeg and Weeramantry of the International Court of Justice have accepted the invitation to judge the finals.

Other Events

In September, 1993, Intelsat and Martin Marietta settled a lawsuit stemming from a Titan-3's failure to launch Intelsat 603 into its proper orbit in March, 1990, which was found to be caused by miswiring of the Titan's payload deployer. Under the terms of settlement, Intelsat will purchase an additional Intelsat-8 spacecraft from Martin Marietta at a discount price.

Under a settlement reached on October 4, 1993, with the United States Department of Justice, the Perkin Elmer Corporation, builder of the flawed Hubble Telescope mirror, reimbursed NASA \$15 million, about one-tenth of the cost NASA incurred in correcting the defect.

The STS '93 Forum on Space Transportation Systems took place in Nancy, France, on Nov. 25-26, 1993.

The 10th European Satellite Communications Conference met in London, England on December 7-8, 1993.

The President of Argentina opened the First World Telecommunication Development Conference (WTDC 94) held by the ITU which took place in Buenos Aires, Argentina on March 21-29, 1994.

Topics of discussion of the Tenth National Space Symposium, held April 5-8, 1994, in Colorado Springs, Colorado, included the international space station, international competition in space launches, the support of life on planet earth, and issues of national security.

Organized by the ITU as part of its program of regional TELECOM events, the Africa TELECOM '94 met in Cairo, Egypt on April 25-29, 1994.

The Global Air & Space '94 - International Business Forum and Exhibition - was held in Arlington, Virginia, May 3-5, 1994.

* For a text of the Guidelines, see the Current Documents section in this volume of the JOURNAL.

Brief News

New findings by British astronomers may shed light on one of the issues of the "Big Bang" theory, whether the Universe will expand forever or whether it is in a constant cycle of expansion and contraction....A scientist has confirmed the existence of two planets orbiting a dense star in the Milky Way Galaxy....Scientists assert that an unseen cluster of objects at least ten times more massive than what scientists previously had identified as the most massive force of the Universe may be pulling our Galaxy toward it.

Pockmarks, no more than an eighth of an inch in diameter, found on the face plate of the planetary camera removed from the Hubble space telescope in December, 1993, were likely caused by dust the size of a grain of sand, or perhaps debris from earlier launches....The refurbished Hubble space telescope made a significant scientific discovery when it provided the first conclusive evidence of a massive black hole at the core of a distant galaxy, thereby confirming predictions based on Einstein's theory of general relativity....The Hubble has photographed twenty comet fragments that are expected to smash into the planet Jupiter in July, 1994, with the force of 100 million hydrogen bombs.

A broken fuel line appears to have been the most likely cause of loss of the \$1 billion Mars Observer in August, 1993.

An unmanned spacecraft, named Clementine, was launched in late January, 1994 on a 7-month-mission, jointly sponsored by NASA and the Department of Defense, to map the entire surface of the moon and an asteroid named Geographos. The first close-up pictures of the Moon taken from space since 1972 were released in March, 1994. They were taken from the Clementine spacecraft.

In February 1994, an Air Force Titan IV rocket released the MILSTAR satellite, designed to provide instant, extra-secure communications among the U.S. armed services.

Columbia, NASA's oldest space shuttle launched in March 1994, carried more engineering and technology experiments than have ever flown on a shuttle before.

In March, 1994, the Galileo Space Probe spotted on its way toward Jupiter what scientists believe is a natural satellite of the asteroid IDA. If so, it would be the first asteroid moon ever sighted.

The Space Shuttle Endeavour has been using some of the most sophisticated radar instruments ever put into space during its 10-day earth surveying mission in April, 1994. Endeavour has mapped about 3 million square miles of the Earth's surface, an area equivalent to half the United States.

A military communications satellite experienced a power failure in orbit in March, 1994.

A Russian cosmonaut received ham-radio permission on the recent Discovery mission, America's first jointly staffed mission with Russia, since the 1975 Apollo-Soyuz link-up....Before their return to Earth on

January 14, 1994, two Russian cosmonauts spent 197 days aboard the Mir space station. This included a 21-day joint mission with a French astronaut....In February, 1994, three cosmonauts celebrated the eighth anniversary of the 130-ton space station MIR which was launched by the Soviet Union on Feb. 20, 1986 and on July 3, 1994, a Russian and a Kazakh cosmonaut docked a Russian spaceship with MIR....The Russian Government has now begun the privatization of NPO Energia, the organization that manages MIR and assembles the Proton upper stage....On March 28, 1994, Russia and Kazakhstan agreed on a long-term lease arrangement that provides the Russian Military Space Forces with continued control of the Baikonur launch site.

On July 3, 1994, China's Long March rocket successfully placed into correct orbit a recoverable research satellite.

Member States of ESA have reaffirmed their participation in the International Space Station Program....France and Austria announced that they would keep their payments to ESA at current levels for the rest of the decade....The first launch of Ariane-5 is currently scheduled for late 1995 or early 1996....Artemis, the first experimental data relay satellite, is to be launched in 1996....On Jan. 1, 1995 Finland will become the 14th ESA Member State.

Japan's space agency, NASDA, is pursuing research on element and system technologies involving robot simulators, robots for orbital servicing and lunar exploration....A Japanese H-II rocket, the product of revolutionary new breakthroughs in propulsion technology, designed to lift a 10-ton payload into low earth orbit, was successfully launched on February 4, 1994.

Micronesia, Bahrain and Hungary joined INTELSAT, bringing its membership to 131.

Taking its first step towards privatization, INMARSAT approved on May 13, 1994 the creation of a separate subsidiary to run a satellite constellation that will provide global wireless telephone service. Bangladesh, Brunei Darussalam, Georgia and the Slovak Republic joined INMARSAT bringing the membership to 71.

EUTELSAT has approved membership applications from Estonia, Latvia, Moldova, Andorra, Bulgaria, and the Russian Federation. The minimum investment required for each new member is about \$50,000 per year.

As of January 1, 1993, the ITU had 182 members.

India launched a medium-range, surface-to-surface ballistic missile in February, 1994, bringing India's missile technology closer to that of the United States, Russia, and France.

On July 2, 1993, South Africa passed the Space Affairs Act.

B. Forthcoming Events

ITU's next Plenipotentiary Conference will be held in Kyoto, Japan on September-October 1994.

As previously reported, the 1994 Colloquium on the Law of Outer Space will be held Oct. 9-14, 1994 in Jerusalem, Israel. The following topics will be discussed: (1) New Legal Developments in Satellite Communications, to be chaired by Prof. F. Lyall (U.K.); (2) Definitional Issues in Space Law, to be chaired by Prof. S. Gorove (U.S.A.); (3) Liability in Commercial Space Activities, to be chaired by Prof. K.-H. Böckstiegel (Germany); (4) Other Legal Matters, to be chaired by Prof. V. Kopal (Czech Rep.).

The 1995 IISL Colloquium will be held in October, 1995 in Oslo, Norway. The following subject matters are scheduled for discussion: (1) Recent Developments in the Law of Intergovernmental Organizations Dealing with Outer Space Matters, to be chaired by Dr. M. Bourély (France).¹ (2) Legal Issues Arising From Recent Technical Studies Relating to Space Debris, to be chaired by Prof. M. Williams (Argentina) and Dr. L. Perek (Czech Rep.) (invited).² (3) Legal Aspects of Commercial Space Activities, to be chaired by Dr. Fife (Norway).³ (4) Other Legal Matters, to be chaired by Dr. N.M. Matte (Canada).⁴

Following the success of the first workshop on *Intellectual Property Rights and Space Activities*, in a European perspective, the European Centre for Space Law and the European Space Agency are organizing a second workshop, in a worldwide perspective, on December 5 and 6, 1994.⁵ Intellectual property rights raise a number of important legal

¹ In this session, the legal advisors of various organizations will be invited to discuss the developments and activities within their organization (e.g. ESA, ITU, Inmarsat, Eutelsat...). In addition, individual papers dealing with this topic may be submitted.

² The specific purpose of this session is to identify and define the problem of space debris in legal terms, in order to provide a genuine contribution to the solution of the space debris problem. Only those papers which use the most recent technical data as the basis for their research shall be accepted. Examples of recent technical debris studies are: ESA-SP 1109 (1988); Interagency Group (SPACE) report for National Security Council, Washington, D.C. (1989); US Congress/OTA Background Paper, (1990); US Congress/General Accounting Office (1990); ESA Contract no. 9024/90/NL/PM(SC) (1992); Report of study group of Japan Society for Aeronautical and Space Sciences, Tokyo (1992); IAA Position Paper, *Acta Astronautica* (Oct. 1993), etc.

³ Papers in this session may address questions of intellectual property, transfer of technology and launch agreements.

⁴ Authors in this session may select their own topics, which should deal with pertinent issues in the field of space law. Special attention may be given to NPS, review of the Moon Agreement, Article I of the Outer Space Treaty (the Benefit Principle), and the settlement of disputes.

⁵ The workshop will be chaired by Mr. Said Mostesher Mackenzie, London and San Diego. In a first session, *"Intellectual Property Rights and Space Activities: A Global Scenario,"* presentations will be given on Intellectual Property Rights policy and practice by the representatives of the main national space agencies in the world. The second session, *"Intellectual Property Rights: Practical Experiences and Importance of the Legal Environment,"* will emphasize the issues of Intellectual Property Rights encountered in their experience by those active in

questions with regard to space activities and, in this view, the objective of the workshop is to present a first analysis of legal and policy issues with regard to intellectual property rights and space activities in a world context. Invited experts representing the major space faring nations will present an overview of the different ways they deal with intellectual property questions related to space activities in order to inform and stimulate awareness of these issues among representatives of the private and public entities, such as WIPO, EPO, EU, intellectual and/or industrial law firms and promote the need for an in depth world-wide study on the possibilities to elaborate a more harmonized legal environment.

space activities (industry, ESA, national space agencies) and the relevance of the legal environment in this context. The third session, *"International Agreements and Intellectual Property Rights"* will enlarge the analysis to a European and worldwide perspective, with the participation of speakers from the European Commission, the European Patent Office and the World Intellectual Property Organisation.

Admittance to the workshop is free of charge but we can only welcome a limited number of participants. For more information on the workshop, contact Valerie Kayser, Executive Secretary, European Centre for Space Law (ECSL), 8-10 rue Mario Nikis, 75738 Paris Cedex 15, Phone: 42.73.76.05. Fax: 42.73.75.60.

BOOK REVIEWS/NOTICES

Reviews

AN INTRODUCTION TO SPACE LAW, by I.H.Ph. Diederiks-Verschoor (Kluwer 1993), pp. 238.

This introductory paperback, written by the President Emeritus of the International Institute of Space Law of the International Astronautical Federation, is a most welcome addition to an otherwise already rich space law literature. The book is unique in filling a gap by providing a systematic and concise, yet carefully developed, exposition of the basic issues of space law in seven well annotated chapters.

The book's coverage extends to issues involving the boundaries of outer space and the major space law conventions drafted by the U.N. Committee on the Peaceful Uses of Outer Space. Also espoused are the exploitation and uses of outer space associated with meteorology, telecommunications, remote sensing, manned space flights, space transportation systems, large space structures, solar power satellites, nuclear power sources and commercial implications. The last chapters focus on environmental issues and the preservation of outer space for peaceful purposes and prospective developments, including trends in space law. Texts of the five UN-drafted space agreements and principles on direct broadcast satellites, remote sensing and nuclear power sources, as well as a bibliography, are included for easy reference and orientation.

The particular charm of the book is that it serves both as an introduction to the uninformed in an easily understandable manner and, at the same time, it represents a scholarly overview that can be read with benefit by those familiar with space law since it sheds light on many important issues and takes solid positions.

Stephen Gorove
Chairman, Editorial Board
JOURNAL OF SPACE LAW

COMMERCIAL UTILIZATION OF SPACE, by H.L. van Traa-Engelman (Nijhoff 1993), pp. 442.

After a brief historical introduction to space law, this treatise starts out with an analysis of the legal implications of space transportation and then moves on to review the international regulation and practice of satellite communications, including those pertaining to the ITU, UNCOPUOS and GSO, INTELSAT, INTERSPUTNIK, INMARSAT, EUTELSAT, EUMETSAT, ARABSAT, and DBS. This is followed by a discussion of the legal implications of remote sensing, intellectual property, private enterprise, insurance, and the settlement of space law disputes.

Obviously, it is not possible in a brief book review to list, even in a schematic manner, the multitude of interesting issues and problems which

are skillfully elaborated by the author in this treatise. However, by way of an example, it may be mentioned, for instance, that in connection with her analysis of the legal implications of space transportation, the author raises the all important issue "what are the national activities in outer space to which the basic state responsibility applies?" (p. 60). In response, she quite correctly states that Article VI of the Outer Space Treaty of 1967 does not offer a clear answer about the determination of 'national activities' in the event of non-governmental entities. She notes that there are basically two different ways of coming up with a solution to this question. The first solution would leave it up to the individual state to define the qualification rules for 'national activities' in outer space. The second one would be to take the position that the coverage of the phrase 'national activities' in outer space derives from international law. In this connection, the author undertakes the *extra* effort of looking at relevant provisions of the major space treaties in some detail in order to find an answer. Ultimately, she comes to the conclusion - with which this reviewer fully agrees - that the use of the 'launching state' criterion to identify the responsible state "will cover nearly all cases of space involvement, excluding only those instances in which private organizations launch space objects from a place other than a state's territory or facility, for instance, directly from the high seas." In these cases "the application of a second criterion based on the nationality and/or seat of the persons or organizations respectively which launch the space object," could fill the lacuna (p. 63).

The foregoing example illustrates the care with which issues and provisions have been analyzed by the author, not because her conclusion happens to be in agreement with the position taken by this reviewer on the issue many years ago,* but because the author systematically develops a careful analysis in support of it. As a further thought to the issues analyzed, one may add a recent proposal of three aerospace companies (Boeing, NPO Energia and NPO Yushnoye) of different nationality (U.S.A., Russia and Ukraine) which plan jointly to launch satellites from a mobile launch site in international waters. In such a case, the "appropriate State" which is to exercise continuing supervision could not be the launching State, the launch being from international waters. At the same time, there would be three different States which would qualify as the State of nationality because companies of three different nations are involved. Thus it appears that there would be more than one "appropriate State."

Of course as in any book, there are many issues which are not touched upon, such as those pertaining to concurrent criminal jurisdiction arising under the Space Station Agreement. This, however, should not detract from the competency and care with which the various fields and issues are analyzed throughout the book. A special plus of this monograph is the inclusion in its Annex of a seldom reprinted Convention on the

* Stephen Gorove, *Liability in Space Law: An Overview*, 8 ANN. AIR & SPACE L. 373, at 377 (1983).

Settlement of Space Law Disputes, prepared under the auspices of the International Law Association.

Stephen Gorove
Chairman, Editorial Board
JOURNAL OF SPACE LAW

AIR AND SPACE LAW; DE LEGE FERENDA - ESSAYS IN HONOUR OF HENRI A. WASSENBERGH, edited by Tanja L. Masson-Zwaan & Pablo M. Mendes De Leon (Nijhoff 1992), pp. 305.

This book, honoring Professor Henri A. Wassenbergh of Leiden University, as suggested by its title, is broken down into two parts, containing essays in the fields of both air and space law. The contributions in the latter area are wide ranging and extend to the nationality of spacecraft (*Bin Cheng*), the principle of *jus cogens* (*Frans G. von der Dunk*), freedoms of the air - the way to outer space (*Manfred Lachs*), the aerospace plane (*Tanja L. Masson Zwaan*), communications satellites (*Nicolas Mateesco Matte*), dispute resolution (*Rachel B. Trinder*) and open skies (*Vladlen S. Vereshchetin*).

While the portion of the book dealing with space law is not as extensive as that covering air law, it nonetheless constitutes a significant contribution to the literature by well-known authors, several of whom have actively participated in drafting and building the law of outer space. In view of this, the space law essays may be read with benefit and interest by scholars and policy makers alike.

Book Notices

CHOOSING THE RIGHT STUFF, THE PSYCHOLOGICAL SELECTION OF ASTRONAUTS AND COSMONAUTS, by Patricia A. Santy (Praeger 1994), pp. 324.

This book deals with a subject that has seldom, if ever, been discussed by international colloquia dealing with space law matters. What would the psychological selection of astronauts and cosmonauts have to do with legal issues relevant to the field of space exploration and utilization? Yet when one looks at the content of the book which includes such topics as "Not Everyone Can Fly - The Psychiatric Evaluation," and reviews the European, Japanese and Soviet procedures in addition to the American "stuff," the inevitable thought that comes to mind is whether psychiatric evaluations are legally part and parcel of the notion of astronauts and cosmonauts. Would future passengers on space flights have to undergo similar tests? If not, or if they would be required to undergo less rigorous tests, could they still be regarded as astronauts or cosmonauts and receive the benefits, protection and special status accorded to them under the space treaties? Most likely not in the professional sense. There would be a clear distinction between the professional astronauts and cosmonauts and others who travel in outer space without the rigors of training and evaluation. While common sense suggests that there should be a difference,

the use of the word "personnel" in Article VIII of the Outer Space Treaty raises the issue whether the term should apply only to professional personnel or whether it should be regarded to include passengers as well. Similarly, the Agreement dealing with the Rescue and Return of Astronauts raises the issue whether it should apply only to professional astronauts or be extended to other people traveling in outer space.

WERNHER VON BRAUN - CRUSADER FOR SPACE, by Ernst Stuhlinger & Frederick I. Ordway III (Krieger 1994), pp. 147.

This book is a well illustrated history of the life and achievements of Wernher von Braun, a leading rocket scientist of this century whose knowledge, leadership and unwavering devotion to space exploration were a significant element in achieving mankind's age-old dream, the landing of a man on the Moon.

The pictorial history goes back to Braun's early years as a child and student in Germany, then extends to the Peenemünde years and his transfer to America. This is followed by the Redstone years and the Apollo Drama, and ends with his final years in Washington, D.C. The book also has ample illustrations of his workplaces, hardware and dreams. It includes 21 color plates, a listing of his honors and selected works.

The wealth of pictures, many from his personal collections never before published, is accompanied by short captions and explanations of the occasions (the time, place, personalities, etc.) captured in the photos. They make space history more vivid and easier to follow.

The book should be of interest to space historians. Beyond that, the average reader may wish to know how a leading rocket scientist's enthusiasm and devotion has influenced the birth of the space age.

THE SIXTH, SEVENTH, EIGHTH, NINTH NATIONAL SPACE SYMPOSIUM, PROCEEDINGS REPORTS, APRIL 9-11, 1990; APRIL 9-11, 1991; MARCH 31-APRIL 3, 1992; APRIL 13-16, 1993. (United States Space Foundation, Univelt 1990, 1992, 1993, pp. 184; pp. 215; pp. 278; pp. 210, respectively).

The United States Space Foundation has done an outstanding job in sponsoring annual forums which provide an important overview of some of the highlights of civil, military, commercial and international space developments by leading policy makers.

The wide range of topics discussed in these volumes include, for instance, the development of space launch capabilities and infrastructure as a national resource, manned and unmanned space flights, the space station, Lunar and Mars missions, national space policy and budget issues, the influence of changed international relations on space exploration, outlook for the U.S. space program, unparalleled launch vehicle propulsion capabilities, national security issues, and many others.

The books are amply illustrated by photographs of the leading participants and are also highlighted by summations in bold letters of the more important statements.

PROSPECTS FOR INTERSTELLAR TRAVEL, by John H. Mauldin (American Astronautical Society, Univelt 1992), pp. 370.

This book is a sober analysis of the formidable challenges and difficulties inherent in any endeavor involving interstellar travel by human beings. Notwithstanding the effort to tone down stark reality, the book appears to shed cold water on the aspirations and hopes of many space enthusiasts and followers of science fiction who will continue to cross galaxies, black holes and universes in the flash of a thought - which is faster than light.

RECENT PUBLICATIONS*

A. Books

- BENKÖ, MARIETTA & SCHROGL, KAI-UWE (EDS.), *INTERNATIONAL SPACE LAW IN THE MAKING - CURRENT ISSUES IN THE UN COMMITTEE ON THE PEACEFUL USES OF OUTER SPACE* (Forum for Air & Space Law, vol. I, Editions Frontières 1993).
- D'ANGELO, GEORGE V., *AEROSPACE BUSINESS LAW* (Quorum Books 1994).
- ESSER, WAYNE J./TOMAJAN, DON K. (EDS.), *SPACE BUSINESS OPPORTUNITIES* (American Astronautical Soc'y, Univelt 1992).
- MAULDIN, JOHN H., *PROSPECTS FOR INTERSTELLAR TRAVEL* (American Astronautical Soc'y, Univelt 1992).
- SANTY, PATRICIA A., *CHOOSING THE RIGHT STUFF - THE PSYCHOLOGICAL SELECTION OF ASTRONAUTS AND COSMONAUTS* (Praeger 1994).
- SIMPSON, JOHN A. (ED.), *PRESERVATION OF NEAR-EARTH SPACE FOR FUTURE GENERATIONS* (Cambridge Univ. Press 1994).
- STUHLINGER, ERNST & ORDWAY III, FREDERICK I., WERNHER VON BRAUN: *CRUSADER FOR SPACE, AN ILLUSTRATED MEMOIR* (Krieger 1994).

B. Contributions to Books

- Alwes, Detlef/Benkö, Marietta/Schrogl, Kai-Uwe, *Space Debris: An Item for the Future*, in BENKÖ, MARIETTA & SCHROGL, KAI-UWE (EDS.), *INTERNATIONAL SPACE LAW IN THE MAKING - CURRENT ISSUES IN THE UN COMMITTEE ON THE PEACEFUL USES OF OUTER SPACE* 233 (Forum for Air & Space Law, vol. I, Editions Frontières 1993).
- Benkö, Marietta & Schrogl, Kai-Uwe, *The UN Committee on the Peaceful Uses of Outer Space in International Space Law in the Making - Current Issues*, *id.* at 1.
- Benkö, Marietta & Gebhard, Jürgen, *The Use of Nuclear Power Sources in Outer Space*, *id.* at 19.
- Benkö, Marietta & Gebhard, Jürgen, *The Definition /Delimitation of Outer Space and Outer Space Activities Including Problems Relating to the Free ("Innocent") Passage of Spacecraft through Foreign Airspace for the Purpose of Reaching Orbit and Returning to Earth*, *id.* at 113.
- Schrogl, Kai-Uwe, *Questions relating to the Character and Utilization of the Geostationary Orbit*, *id.* at 152.
- Schrogl, Kai-Uwe, *Legal Aspects Related to the Application of the Principle that the Exploration and Utilization of Outer Space Should be Carried out for the Benefits and in the Interest of all States Taking into Particular Account the Needs of Developing countries*, *id.* at 196.

* Compiled and edited by Michael A. Gorove, Boston University School of Law.

- Edwards, David, *Commercial Remote Sensing*, in ESSER, WAYNE J. & TOMAJAN, DON, K. (EDS.), *SPACE BUSINESS OPPORTUNITIES* 169 (American Astronautical Soc'y, Univelt 1992).
- Pryke, Ian, *European Space Agency and its Long-Term Plan*, *id.* at 129.
- Baker, Howard A. *Regulation of Orbital Debris - Current Status*, in: SIMPSON, JOHN A. (ED.), *PRESERVATION OF NEAR-EARTH SPACE FOR FUTURE GENERATIONS* 180 (Cambridge Univ. Press 1994).
- Gorove, Stephen, *Preservation of Near-Earth Space Environment for Future Generations: Current Initiatives on Space Debris in the United Nations*, *id.* at 205.
- Lang, Winfried, *Environmental Treaty-making: Lessons Learned for Controlling Pollution of Outer Space*, *id.* at 165.
- MacLure, Jeffrey/ Bartley, William C., *Orbital Debris: Prospects for International Cooperation*, *id.* at 201.
- Meredith, Pamela L., *A Legal Regime for Orbital Debris: Elements of a Multilateral Treaty*, *id.* at 214.
- Wood, Diane P., *Who Should Regulate the Space Environment: The Laissez-Faire, National, and Multinational Options*, *id.* at 189.

C. Articles

- Böckstiegel, Karl-Heinz, *Space Law Past and Future: The Challenges of the XXIst Century*, 17 ANN. AIR & SPACE 15-28 (1992).
- Christol, Carl Q., *Influence of the International Institute of Space Law and the International Law Association on the Development of Space Law*, 42 ZEITSCHRIFT FÜR LUFT- UND WELTRAUMRECHT (ZLW) 430 (1993).
- Christol, Carl Q., *The Aerospace Plane: Its Legal and Political Future*, 9 SPACE POL'Y 35 (1993).
- Delpesch, J.F./ Logsdon, J.M./ Meslin, B., *A New Cooperative Strategy for Space in the Twenty-first Century*, 8 SPACE POL'Y 265 (1993).
- Diaz, Daria, *Trashing the Final Frontier: An Examination of Space Debris from a Legal Perspective*, 6 TUL. ENVTL. L. J. 369 (1993).
- Dunk, von der, Frans, *The Spider in the Web and the Rainproof Umbrella*, 15 REVISTA DEL CENTRO DE INVESTIGACION Y DIFUSION AERONAUTICO - ESPACIAL (C.I.D.A-E.) 27 (1991).
- Ferrazzani, M./Thiebaut, W., *The Legal Protection of Remote-Sensing Satellite Data*, 76 ESA BULL. 61 (1993).
- Ferrier, Jill, *The Open Skies Treaty of 1992*, 18 ANN. AIR & SPACE L. 79 (Pt. I, 1993).
- Gabrynowicz, Joanne Irene, *The Promise and Problems of the Land Remote Sensing Act of 1992*, 8 SPACE POL'Y 319 (1993).
- Gibson, Roy, *Earth Observation Data Policy*, 8 SPACE POL'Y 272 (1993).
- Kamenetskaya, E., *The Present Developments of Legal Regulations of Space Activities in Russia and Commonwealth of Independent States*, 26 AKRON L. REV. 465 (1993).
- Manner, J. A., *President Bush's 1990 Policy on the Commercial Space Former Soviet Union: A Proposal for Change*, 58 J. AIR L. & COM. 981 (1993).

- Marko, David Everett, *A Kinder, Gentler Moon Treaty: A Critical Review of the Current Moot Treaty and a Proposed Alternative*, 8 J. NAT. RESOURCES & ENVIR. L. 293 (1992).
- Martin, Pierre-Marie, *Space Debris: Remarks on the Visible and the Unvisible*, 43 ZLW 30 (1994).
- McDougal, Myres S., *Legal Bases for Securing the Integrity of the Earth-Space Environment*, 8 J. NAT. RESOURCES AND ENVTL. L. 293 (1993).
- Moutier, M. Lyonnet du/Collet, J., *Using Lunar Resources - The Next Step?*, 77 ESA BULL. 59 (1994).
- Salin, Patrick A., *L'Évolution du Régime Juridique de la Télédétection aux États-Unis*, 18 ANN. AIR & SPACE L. 241 (Pt. I, 1993).
- Seay III, G. E., *Remote Sensing: The Media, the Military, and the National Security Establishment - A First Amendment Time Bomb*, 59 J. AIR L. & COM. 239 (1993).
- Sterns, Patricia M./Tennen, Leslie I., *International Law and the "the Art of Living in Space": The Recognition of Settlement Autonomy*, 9 SPACE POL'Y 213 (1993).
- Tucker, Stephen, *Some Strategic Defense Initiatives Toward Preventing U.S. Space Insurance Related Disputes and Litigation*, 21 J. SPACE L. 123 (1993).
- Tuinder, Harry, *The Implication of the Emerging European Community's Regulatory and Policy Role in the Field of Space Activities*, 18 ANN. AIR & SPACE L. 331 (Pt. I, 1993).
- Vahrenwald, A., *Intellectual Property on the Space Station 'Freedom'*, 15 EUR. INTELL. PROP. REV. 318 (1993).
- Wassenbergh, Henri A., *The Law Governing International Private Commercial Activities of Space Transportation*, 21 J. SPACE L. 97 (1993).
- Weaver, J. H., *Lessons in Multilateral Negotiations: Creating a Remote Sensing Régime*, 7 TEMP. INT'L & COMP. L.J. 29 (1993).

Reports

- Bogomolov, Vladimir, *Prevention of an Arms Race in Outer Space: The Deliberations in the Conference on Disarmament in 1993*, 21 J. SPACE L. 141 (1993).
- Boudreault, Richard, *Strategic Plan for Civilian Remote Sensing - OTA The Greening of Space?*, 8 SPACE POL'Y 342 (1993).
- Chipman, Ralph, *United Nations Committee on the Peaceful Uses of Outer Space Holds 1993 Annual Meeting in New York*, 21 J. SPACE L. 146 (1993).
- Focke, von Knut, *Europäisches Zentrum für Weltraumrecht (ECSL): Generalversammlung, Paris, 25 June 1993*, 42 ZLW 444 (1993).
- Haubold, Hans J./Wamsteker, Willem, *Third United Nations European Space Agency Workshop on Basic Space Science, Lagos, Nigeria, Oct. 18-22, 1993*, 43 ZLW 66 (1994).

- Kayser, Valérie, *International Colloquium: The Implementation of the ESA Convention - Lessons from the Past*, Florence, Oct. 25-26, 1993, 43 ZLW 68 (1994).
- Masson-Zwaan, Tanja L., *Colloquium on the Law of Outer Space*, Graz, Austria, Oct. 18-22, 1993, 21 J. SPACE L. 150 (1993).
- Reibel, David E./Stoffel, Wilhelm, *44th International Astronautical Congress: Challenges of Space for a Better World*, Graz, Austria, Oct. 16-22, 1993, 43 ZLW 61 (1994).
- Schrogl, Kai-Uwe, *European Space Agency (ESA) - International Relations Committee (IRC): Space Applications in the Context of the Developing World*, Paris, Oct. 27, 1993, 43 ZLW 70 (1994).
- Schrogl, Kai-Uwe/ Alwes, Detlef, *Deutsche Agentur für Raumfahrtangelegenheiten (DARA) GmbH, Wissenschaftliche Tagung: Hindernisse für die Raumfahrt durch Space Debris - Forschungsaktivitäten, Gefahren und Bearbeitungsmöglichkeiten*, Bonn, Dec. 2, 1993, 43 ZLW 74 (1994).

Notes/Comments

- Baca, K. A., *Property Rights in Outer Space*, 58 J. AIR L. & COM. 1041 (1993).
- Orrico, Miguel, *The Mexican Position Before the U.N. Committee on the Peaceful Uses of Outer Space*, 21 J. SPACE L. 163 (1993).
- Paxson III, E. W., *Sharing the Benefits of Outer Space Exploration: Space Law and Economic Development*, 14 MICH. J. INT'L L. 487 (1993).
- Rourk, Chris, *Analysis of the Technical and Economic Issues raised in the Consideration of International Telecommunications Satellite Systems Separate from INTELSAT*, 46 FED. COMM. L.J. 329 (1994).
- Sagar, David, *INMARSAT*, 18 ANN. AIR & SPACE L. 440 (Pt. I, 1993).

Case Notes

- Florida Coalition for Peace and Justice v. George Herbert Walker Bush, 21 J. SPACE L. 167 (1993).
- Hughes Communication Galaxy, Inc. v. The United States, 21 J. SPACE L. 166 (1993).

Short Accounts

- Gorove, Katherine M., *Space Debris Issues*, 21 J. SPACE L. 178 (1993).
- Kayser, Valérie, *The Second ECSL Summer Course on Space Law and Policy*, Toulouse, September 6-18, 1993, 21 J. SPACE L. 170 (1993).
- Malanczuk, Peter, *Organizing Space Activities in Developing Countries: Resources and Mechanisms*, 21 J. SPACE L. 175 (1993).
- Trinder, Rachel B./Meredith, Pamela L., *Important Developments In Space Policy And Law*, 21 J. SPACE L. 173 (1993).

Book Reviews/Notices

- AIAA, SPACE TECHNOLOGY FOR DEVELOPING COUNTRIES - MAKING IT HAPPEN!, AIAA, 1993, 21 J. SPACE L. 189 (1993).
- ANDEM, MAURICE N., INTERNATIONAL LEGAL PROBLEMS IN THE PEACEFUL EXPLORATION AND USE OF OUTER SPACE, Rovaniemi, 1992, 18 ANN. AIR & SPACE L. 467 (Pt. I, 1993).
- BENKÖ, MARIETTA/SCHROGL, KAI-UWE (Eds.), INTERNATIONAL SPACE LAW IN THE MAKING: CURRENT ISSUES IN THE UN COMMITTEE ON THE PEACEFUL USES OF OUTER SPACE, ed. Frontières, 1993 (Bertamini), 43 ZLW 131 (1994).
- BÖCKSTIEGEL, K.-H. (Ed.), MANNED SPACE FLIGHT: LEGAL ASPECTS IN THE LIGHT OF SCIENTIFIC AND TECHNICAL DEVELOPMENT, Köln, 1993 (de Graaff), 42 ZLW 488 (1993).
- CHENG, CHIAG-JUI/MENDES DE LEON, PABLO (Eds.), THE HIGHWAY OF AIR AND OUTER SPACE OVER ASIA, Nijhoff, 1992 (Schrogl), 43 ZLW 132 (1994).
- CHRISTOL, CARL Q., SPACE LAW - PAST, PRESENT, AND FUTURE, Kluwer, 1991 (Kessedjian), 21 J. SPACE L. 187 (1993).
- FLURY, W., (Ed.), PROCEEDINGS OF THE FIRST EUROPEAN CONFERENCE ON SPACE DEBRIS, Darmstadt, 1993, 21 J. SPACE L. 189 (1993).
- GOROVE, STEPHEN, DEVELOPMENTS IN SPACE LAW: ISSUES AND POLICIES, Nijhoff, 1991 (Rothblatt), 88 AMER. J. INT'L L. 194 (1994).
- GREENBERG, JOEL S./HERTZFELD, HENRY R. (Eds.), SPACE ECONOMICS, AIAA, 1992 (Knittlmayer), 43 ZLW 133 (1994).
- HOBE, STEPHAN, DIE RECHTLICHEN RAHMENBEDINGUNGEN DER WIRTSCHAFTLICHEN NUTZUNG DES WELTRAUMS, Duncker & Humblot, 1992, 18 ANN. AIR & SPACE LAW 474 (Pt. I, 1993).
- HURWITZ, B. A., STATE LIABILITY FOR OUTER SPACE ACTIVITIES, Nijhoff, 1992 (K. Gorove), 21 J. SPACE L. 188 (1993).
- MARTIN, PIERRE-MARIE, DROIT DES ACTIVITÉS SPATIALES, 18 ANN. AIR & SPACE L. 480 (Pt. I, 1993).
- MILLER, RON, THE DREAM MACHINES - AN ILLUSTRATED HISTORY OF THE SPACESHIP IN ART, SCIENCE AND LITERATURE, Krieger, 1993, 21 J. SPACE L. 189 (1993).
- MOSTESHAR, SA'ID, EUROPEAN COMMUNITY TELECOMMUNICATIONS REGULATION, Nijhoff, 1993 (Schrogl), 43 ZLW 134 (1994).
- PEYREFITTE, LÉOPOLD, DROIT DE L'ESPACE, ed Dalloz, 1993, 18 ANN. AIR & SPACE L. 481 (Pt. I, 1993).
- PEYREFITTE, LÉOPOLD, DROIT DE L'ESPACE, ed Dalloz, 1993 (S. Gorove), 21 J. SPACE L. 185 (1993).
- ROTH, ARMAND D., LA PROHIBITION DE L'APPROPRIATION ET LES RÉGIMES D'ACCÈS AUX ESPACES EXTRA-TERRESTRES, Presses Universitaires de France, 1992 (Peterson), 88 AMER. J. INT'L L. 413 (1994).
- SLOVAR MEZDUNARODNOGO KOSMICHESKOGO PRAVA (INTERNATIONAL SPACE LAW DICTIONARY), Moscow, 1992 (Lipunov), 21 J. SPACE L. 186 (1993).
- VAN TRAA-ENGELMAN, HANNEKE-LOUISE, COMMERCIAL UTILIZATION OF OUTER SPACE: LAW AND PRACTICE, Nijhoff, 1993 (Schrogl), 43 ZLW 130 (1994).

D. Official Publications*Agreements*

- Accession by Andorra to the Convention of Nairobi (1982) on Nov. 12, 1993.
- Accession by Belize, the Republic of Bolivia, the Republic of Mauritius, and the Syrian Arab Republic to the Constitution and Convention of the ITU (Geneva, 1992) on Nov. 9, 1993, Jan. 6, 1994, and Dec. 14, 1993, respectively.
- U.S.-Belarus Agreement on Science and Technology Cooperation, with annex. Signed at Minsk Jan. 14, 1994. Entered into force Jan. 14, 1994.
- U.S.-Kazakhstan Agreement on Science and Technology Cooperation, with annex. Signed at Washington Feb. 14, 1994. Entered into force Feb. 14, 1994.
- U.S.-Russian Federation Protocol on Cooperation in the Implementation of Certain Defense Conversion Projects. Signed at Moscow Dec. 16, 1993. Entered into force Dec. 16, 1993.
- U.S.-Russian Federation Memorandum on Cooperation in the field of Defense Conversion. Signed at Moscow Dec. 16, 1993. Entered into force Dec. 16, 1993.
- U.S.-Russian Federation Agreement on Science and Technology Cooperation, with annexes. Signed at Moscow Dec. 16, 1993. Entered into force Dec. 16, 1993.

CONGRESS

- HOUSE COMMITTEE ON FOREIGN AFFAIRS, EXPORT PROMOTION FOR THE PRODUCTS OF DEFENSE CONVERSION AND DIVERSIFICATION: HEARING before the Subcommittee on Economic Policy, Trade, and Environment, 103d Cong. 1st Sess. (Aug. 5, 1993).
- HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, CONVERGENCE OF CIVILIAN AND DEFENSE POLAR-ORBITING WEATHER SATELLITES: HEARING before the Subcommittee on Space, 103d Cong. 1st Sess. (Nov. 9, 1993).
- HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, NASA'S COMMERCIAL SPACE PROGRAMS: HEARING before the Subcommittee on Space to review NASA space commercialization programs, including Centers for Commercial Development of Space (CCDS) program promoting partnerships among universities, industry, and government to facilitate private sector participation in space commercialization, 103d Cong. 1st Sess. (Oct. 20, 1993).
- HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, REPORT: Oversight Visit: Baikonur Cosmodrome, 103d Cong. 2d Sess. (Mar. 23, 1994).
- HOUSE COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY, U.S.-RUSSIAN COOPERATION IN THE SPACE STATION PROGRAM: Parts I and II, 103d Cong. 1st Sess. (Oct. 6, 14, 1993).

INMARSAT

INMARSAT Annual Review and Financial Statements 1993 (1994).

ITU

Thirty-third Report by the International Telecommunication Union on Telecommunications and the Peaceful Uses of Outer Space (Geneva 1994).

NASA

Advanced technology for America's future in space [microform]: A review of NASA's integrated technology plan for the civil space program (1992).

Bryan Palaszewski, *Space transportation alternatives for large space programs [[microform]]: The International Space University Summer Session* (1993).

Gregory N. Katnik, Barry C. Bowen, J. Bradley Davis, *Debris/ice/TPS assessment and integrated photographic analysis for shuttle mission STS-57* (microform, 1993).

NASA Advisory Council, Aerospace Medicine Advisory Committee, *Strategoc Considerations for support of humans in space and Moon/Mars explorationn missions* (vol. II, microform, 1992).

Response to recommendations by the United States Advisory Committee on the Future of the U.S. Space Program (1992).

Use of Antarctic analogs to support the Space Exploration Initiative (microform, 1990).

NASDA

National Space Development Agency of Japan (1993).

UNIDIR

DOYLE, STEPHEN E., *CIVIL SPACE SYSTEMS - IMPLICATIONS FOR INTERNATIONAL SECURITY* (Dartmouth 1994).

UNITED NATIONS

General Assembly, Committee on the Peaceful Uses of Outer Space, *Report of the Committee on the Peaceful Uses of Outer Space*, Off. Rec., 49th Sess., doc. A/49/20 (1994).

General Assembly, Committee on the Peaceful Uses of Outer Space, *Report of the Legal Subcommittee on the Work of its Thirty-third Session*, doc. A/AC.105/573 (1994).

- General Assembly, Committee on the Peaceful Uses of Outer Space, *Report of the Scientific and Technical Subcommittee on the Work of its Thirty-first Session*, doc. A/AC.105/571 (1994).
- General Assembly, Committee on the Peaceful Uses of Outer Space, *Report of the United Nations Expert on Space Applications to the Scientific and Technical Subcommittee*, doc. A/AC.105/555 (1994).
- General Assembly, Committee on the Peaceful Uses of Outer Space, *Scientific and Technical Presentations to the Scientific and Technical Subcommittee at its Thirty-first Session*, doc. A/AC.105/574 (1994).
- Office for Outer Space Affairs, *Highlights in Space - Progress in Space Science, Technology and Applications, International Cooperation and Space Law*, doc. A/AC/105/566 (1994).

WMO

- Annual Report of the World Meteorological Organization*, doc. A/AC.2105/569 (1993).

E. Cases

- Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corporation (COMSAT), 1993 U.S. Dist. LEXIS 3825.
- Hughes Aircraft Co. v. U.S., 29 Fed. Cl. 197 (1993).
- Smith v. United States, 113 S. Ct. 1178 (1993).

F. Miscellaneous

- ALL RUSSIA RESEARCH INSTITUTE OF STANDARDIZATION, RUSSIAN-ENGLISH DICTIONARY: "Exploration and Application of Space" (in print, Moscow 1994).
- AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, INTERNATIONAL CONFERENCE PROCEEDINGS - COLLECTION OF PAPERS FROM THE 44TH INTERNATIONAL ASTRONAUTICAL FEDERATION (IAF) CONGRESS, OCTOBER 16-22, GRAZ, AUSTRIA (1993).
- Matte, Nicolas Mateesco, *In Memoriam - Judge Manfred Lachs*, 18 ANN. AIR & SPACE L. ii (Pt. I, 1993).
- U.S. SPACE FOUNDATION, THE NINTH NATIONAL SPACE SYMPOSIUM - PROCEEDINGS REPORT, APR. 13-16, 1993 (Univelt 1993).
- INTERNATIONAL INSTITUTE OF SPACE LAW OF THE INTERNATIONAL ASTRONAUTICAL FEDERATION, PROCEEDINGS OF THE THIRTY-SIXTH COLLOQUIUM ON THE LAW OF OUTER SPACE, Oct. 16-22, 1993, GRAZ, AUSTRIA (AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, WASHINGTON, D.C. 1994). INCLUDED ARE:

IISL Board of Directors..... iii

Introduction

N. Jasentuliyanav

Legal Aspects of Space Activities of Organizations of the United Nations System and Other International Organizations

The Intellectual Property Within Public International Research Organizations: The Example of the European Space Agency	
A. M. Balsano	3
Is It Necessary to Establish a World Space Organization?	
S. Courteix	20
Space Law Related to European Space Activities—The <i>Corpus Iuris Spatialis Europeanus</i>	
S. Hobe and P. H. Tuinder	31
The Contribution of the International Astronautical Federation to International Cooperation in Outer Space and the Development of Its Constitution	
V. Kopal	48
Legal Liability for Global Navigation Satellite Systems	
P. B. Larsen	69
The International Telecommunication Union Reconstructed	
F. Lyall	78
The Place of the Missile Technology Control Regime (MTCR) in the International Space Law	
J. Monserrat Filho	89
Activities of the IAEA Concerning Outer Space	
J. Ondrej	93
Legal Aspects of Space Activities of ICAO in Implementing FANS	
H.-K. Shin and S.-K. Hong	98
Legal Aspects of Aeronautical Mobile Satellite Services—The ICAO FANS Concept	
W. Stoffel	116

Adjudication and Arbitration of Disputes Regarding Space Activities

Disputes, Disagreements and Misunderstandings: Alternative Procedures for Settlement (Claims Process in Outer Space)	
H. H. Almond Jr.	125
Arbitration of Disputes Regarding Space Activities	
K.-H. Böckstiegel	136
Creating an International Space and Aviation Arbitration Court	
M. G. Bourelly	144
European Regulation of Competitive Satellite Services: Battling the Cartel and the Monopolies	
M. Potter	150
Adjudication and Arbitration of Disputes Regarding Space Activities	
H. Safavi	163
Resolution of Disputes in the <i>Corpus Iuris Spatialis</i> : Domestic Law Considerations	
P. M. Sterns and L. I. Tennen	172

Legal Aspects of Space Insurance

Insurance Implications About Commercial and Industrial Activities in Outer Space	
G. Catalano Sgrosso	187
The Status of Astronauts Toward the Second Generation Space Law	
Y. Hashimoto	206
Space Insurance and the Legal Aspects of Allocating Risk and Liability Among State and Private Entities	
D. E. Reibel	211

Accidents of Space Activities and Insurance	
H. Yoshida	221

Recent Developments in Space Law with Special Emphasis on Nuclear Power Sources

The United Nations Committee on the Peaceful Uses of Outer Space: Adoption of Principles Relevant to the Use of Nuclear Power Sources in Outer Space	
M. Benkő, G. Gruber, and K.-U. Schrogl	231
Nuclear Power Sources (NPS) for Space Objects: A New Challenge for International Law	
C. Q. Christol	244
Are the Principles on the Use of Nuclear Power Sources in Outer Space a Progress in Space Law?	
A. A. Cocca	255
UN, U.S., and C.I.S. Space Debris Positions: "Heavenly Junk"	
E. R. Finch Jr.	263
Air Crew and Space Crew: Comparative Observations De Lege Ferenda	
G. Gál	272
The Space Agency Forum (SAF) and International Cooperation	
E. Galloway	287
Recent Litigation Involving the Launch of Spacecraft with NPS on Board	
S. Gorove	298
The Notification Principle in the 1992 NPS Resolution	
M. Hosková	304
An Assessment of the United Nations Principles on the Use of Nuclear Power Sources in Outer Space	
N. Jasentuliyana	312
An International Remote Sensing Cartel?	
M. Mejia-Kaiser	322
Changing Basic Space Laws: Popularity, Pragmatism and Historical Lessons	
S. Sanz Fernández de Córdoba	328
Review and Revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space	
A. D. Terekhov	336
The Illogical Link: Launching, Liability and Leasing	
F. G. von der Dunk	349

Addenda

Report of the Discussions Held After the Four Sessions of the 36th Colloquium on the Law of Outer Space	
T. L. Masson-Zwaan	363
Fifteenth Roundtable of the Scientific-Legal Liaison Committee of the International Academy of Astronautics and the International Institute of Space Law: Scientific and Legal Aspects of Space Debris	
Introductory Note	
V. Kopal	366
Scientific and Legal Aspects of Space Debris	
C. Q. Christol	368
Summary of the First European Conference on Space Debris	
W. Flury	386
Summary of Replies to the Questionnaire Which Included Issues Concerning Space Debris	
V. Kopal	394

Liability Issues on Space Debris: The Opinion of a Teacher in International Law	
P. M. Martin	405
Summary of IAA Position Paper on Orbital Debris: Recent Events and Observations	
D. S. McKnight	415
Controlling Orbital Debris: The Role of the U.S. Congress	
R. Obermann and R. A. Williamson	423
Scientific-Legal Roundtable: Comments and Discussion	432
Annual Report 1993: Standing Committee on the Status of International Agreements Relating to Activities in Outer Space	
A. D. Terekhov	436
Legal Issues Concerning Low Earth Orbit Communications Satellite	
Opening Remarks of the Panel Moderator	
J. B. Gantt	445
Recent European Regulatory Issues of Communication Satellite Systems	
M. Ferrazzani	447
Legal and Regulatory Challenges to Universal Personal Communication Services Provided by Low Earth Orbiting Satellites	
R. Frieden	451
United Kingdom Perspective on Two Issues	
S. Mosteshar	457
Manfred Lachs Space Law Moot Court Competition 1993	463
Statutes of the International Institute of Space Law of the International Astronautical Federation	482
Author Index	485

CURRENT DOCUMENTS

*Guidelines for U.S. Implementation of the Agreement Between
the U.S. and Russian Federation Government Regarding
International Trade in Commercial Space Launch Services**

AGENCY: Office of the United States trade representative.

ACTION: Notice of guidelines for U.S. implementation of the agreement between the Government of the United States of America and the Government of the Russian Federation regarding international trade in commercial space launch services.

DATES: The Agreement entered into force on September 2, 1993. These guidelines on monitoring and enforcement are effective upon publication.

FOR FURTHER INFORMATION CONTACT: Scott Monier, (202) 395-3320, Director for European Industry and Technology, Office of the U.S. Trade Representative, 600 17th Street, NW., Washington, DC 20506. (Copies of the Agreement referenced herein can be obtained from the official designated above.)

SUMMARY: On September 2, 1993, the United States and the Russian Federation entered into the Agreement Between the Government of the United States of America and the Government of the Russian Federation Regarding International Trade in Commercial Space Launch Services (Agreement). The Agreement allows the Russian Federation (Russia) to enter the international commercial space launch market during the country's transition to an economy based on market principles in a manner intended to prevent disruption of normal competition. In order to assist in the successful operation of the Agreement, the U.S. Government has established certain guidelines it intends to follow in implementing the Agreement. This notice sets out those guidelines.

SUPPLEMENTARY INFORMATION

Background

At the June 1992 Summit between former President Bush and Russian President Yeltsin, the United States announced that it was granting a one-time exception to its policy of prohibiting the export of U.S.-made satellites or satellites incorporating U.S. technology (essentially all

* 59 FR 11360 (March 10, 1994)

Western satellites) to Russia for launch on Russian space launch vehicles. This one-time exception allowed the International Maritime Satellite Organization (INMARSAT) to select a Russian launcher to launch an INMARSAT 3 satellite. At the same time, the United States stated that, while no further exceptions would be granted, it was willing to undertake negotiations on Russian entry into the international commercial space launch services market. The negotiations culminated in an agreement which would provide Russia, during its transitional phase from a non-market to market economy, access to the international commercial launch services market yet ensure against severe market distortion or disruption to the market. The Agreement was signed by Vice President Gore and Russian Prime Minister Chernomyrdin and entered into force on September 2, 1993.

The Agreement

Definition of Terms

The Agreement defines certain terms, as follows:

Contract means (i) to agree or commit to the provision of commercial space launch services such that a launch is effectively removed from competition in the international market, or (ii) any such agreement or commitment.

International customer means any person; or any kind of corporation, company, association, venture, partnership, or other entity, whether or not organized for pecuniary gain, or privately or governmentally owned or controlled; or any governmental body, excluding the Government of the United States of America and the Government of the Russian Federation; or any intergovernmental organization or quasi-governmental consortium, including but not limited to INTELSAT, INMARSAT and their respective legal successors, that is the ultimate owner or operator of a spacecraft or satellite or that will deliver the spacecraft or satellite to orbit for use by such ultimate owner or operator.

Principal payload means a telecommunications satellite or, in the absence of a telecommunications satellite, any other spacecraft or combination of spacecraft.

Russian space launch service provider means any entity, agent or instrumentality acting on its behalf, permitted by the Government of the Russian Federation to provide commercial space launch services or the space launch vehicles for such services.

Agreement Terms

The Agreement establishes basic rules for avoiding distortion which results from government involvement in the commercial space launch market by prohibiting such practices as certain subsidies, marketing

inducements, and corrupt business practices. The terms of the Agreement also include the following specific provisions:

Quantity Provisions

The Agreement permits Russian space launch services providers to contract with international customers for the launch of up to eight (8) principal payloads, in addition to the INMARSAT-3 satellite, to geosynchronous earth orbit (GEO) or geosynchronous transfer orbit (GTO), for the duration of the agreement (through December 31, 2000). Not more than two (2) such launches may be conducted in any twelve-month period.

Up to four (4) of these launches may be of two principal payloads, and each of these may be counted against the quantity limitation as single launches if the parties mutually agree that the international space launch market so warrants.

The Agreement also allows Russian space launch service providers to contract for up to three (3) launches to low earth orbit (LEO) for the Iridium system. Proposals by Russian space launch service providers for commercial suborbital launches LEO and launches to orbits other than GEO and GTO will be considered on a case by case basis, where there are competing comparable commercial space launch services.

Pricing Provisions

The Agreement provides that prices, terms, and conditions offered by Russian space launch service providers shall be comparable to those offered for comparable space launch services by commercial launch service providers from market economy countries. For GEO and GTO launches, the Agreement establishes a specific pricing mechanism. Bids or offers for launches to GEO or GTO more than 7.5% below the lowest market economy bid trigger special consultations in which Russia must demonstrate that its offer conforms to the principles of the Agreement. Bids or offers for Russian launch services to orbits other than GEO/GTO are not subject to a specific pricing mechanism; however, prices, terms, and conditions must be comparable to those offered by providers from market economy countries. Accordingly, the comparable pricing provision of the Agreement applies to all launches by Russian space launch service providers, including those to LEO.

The pricing provisions of the Agreement apply to bids or offers made as part of a sole-source procurement as well as to completed contracts.

Consultations

The Agreement requires the United States and Russia to hold annual

consultations to " * * * review and examine implementation of the Agreement and market developments in commercial space launch services." The Agreement also allows the United States or Russia to request special consultations "on an urgent basis" prior to the conclusion of a contract, if possible, if either Party has reason to believe that a contract or pending contract is inconsistent with the terms of the Agreement.

Applicability Guidelines

Russian Launch Vehicles

All types or classes of launch vehicles that may be used by a Russian space launch service provider to provide commercial space launch services are subject to the Agreement.

Russian Space Launch Service Providers

Transactions involving launch service providers, regardless of nationality, permitted by the Russian Federation to provide commercial space launch services on Russian launch vehicles are subject to the terms of the Agreement.

Leasing on-Orbit

Leasing a satellite on orbit or satellite transponders does not remove a transaction from the terms of the Agreement. As a general rule, the Agreement applies to a contract calling for the leasing of a satellite on-orbit as to one requiring the launch of a satellite purchased by the customer. The definition of "international customer" as defined in the Agreement makes no distinction based upon the financing arrangement selected for the satellite. There will be no special consideration given to leased satellites launched solely for use by an international customer.

Nationality of Satellite Manufacturer

The terms of the Agreement apply to all satellites, regardless of the manufacturer's nationality. The Agreement is intended to be neutral in its effects on the satellite market.

Contracts Signed Prior to the Agreement

Contracts signed prior to the Agreement for the launch of a satellite subject to United States export controls will be considered under the terms of the Agreement.

Contracts signed prior to the Agreement for the launch of a Russian-built satellite for purchase or lease by an international customer are excluded from the terms of the Agreement.

Options Agreements/Reservations

An option agreement or reservation for Russian commercial space launch services, entered into on or before September 2, 1993, is subject to the terms and provisions of the Agreement.

Monitoring and Enforcement*A. Designation of Responsibility*

The Trade Policy Staff Committee Subcommittee on Russian Space Launch Services (Subcommittee), will be responsible for overall implementation of the Agreement.

B. Subcommittee Organization

For purposes of carrying out its responsibilities with respect to overall implementation of the Agreement, the Subcommittee will be chaired by the Office of the United States Trade Representative (USTR) and will be composed of the Departments of Transportation, State, Commerce, Justice, Defense and Treasury, the Office of Management and Budget (OMB), the National Aeronautics and Space Administration (NASA), the Office of Science and Technology Policy (OSTP), the Joint Chiefs of Staff, and such other departments and agencies as may be invited by the Chair to participate. A Working Group on Information (WGI) will be established to assemble such information as is necessary to enable the Subcommittee to carry out its responsibilities. The WGI will be chaired by the Department of Transportation (DOT) and will include the Departments of Commerce, State, Defense, and such other departments or agencies as designated by the Chair of the Subcommittee.

C. Monitoring and Data Collection

The Subcommittee will monitor Russian compliance with the Agreement. To this end, the Subcommittee will review market and other information relevant to participation in the commercial launch services market by Russian space launch service providers and compliance by those providers with the terms of the Agreement. This information will be assembled, together with a preliminary assessment, and presented to the Subcommittee by the WGI. In monitoring Russian compliance with the Agreement, particular attention will be given to information on the number of contracts with international customers and the distribution of contracts by Russian space launch service providers within any twelve-month period; prices, terms and conditions offered or provided by Russian space launch service providers; unfair business practices; grants and subsidies to commercial space launch services suppliers; inducements to international customers; insurance or reflight guarantees; and government-supported financing for commercial space launch vehicles or services except in

accord with the Organization for Economic Cooperation and Development's (OECD) "Arrangement on Guidelines for Officially-Supported Export Credits."

The Subcommittee will review and determine which information is to be provided to Russia to comply with U.S. obligations under the Agreement. This information will be assembled, together with a preliminary assessment, and presented to the Subcommittee by the WGI in a timely fashion so that it could then be made available to Russia in accordance with the terms of the Agreement.

Particular attention will be given to U.S. obligations under the Agreement with respect to the provision of publicly releasable information to Russia on prices, terms, and conditions offered in the international market for commercial launch services, including insurance arrangements relating to such services.

The WGI will periodically produce information and preliminary assessments of conditions in the commercial launch services market, including prices, terms and conditions, commitments, and market forecasts for the Subcommittee as needed to implement effectively the Agreement and at least 30 days prior to annual consultations.

The WGI will also provide to the Subcommittee such additional information and preliminary assessments on compliance by Russian space launch service providers with the provisions of the Agreement as needed, and at least 30 days prior to annual consultations, or as needed prior to any additional or special consultations.

D. Consultations

The Subcommittee will hold annual consultations with the Russian Federation as outlined in the Agreement. The Subcommittee will exchange information with Russian authorities in advance of such consultations.

The Subcommittee will meet in advance of the annual consultations. The Subcommittee will provide all information, including prices, terms and conditions offered for commercial space launch services, necessary to monitor the Agreement and carry out regular and special consultation. Such information shall be provided to U.S. and/or Russian government authorities promptly, and in any case, no later than 30 days after a request, except that such information need not be provided prior to bids for commercial space launch services.

Following consultations, the Subcommittee will also report on the results of the consultations and recommend any follow-up actions to the TPSC or other appropriate government agencies.

The Subcommittee will consider whether consultations with other international parties could be beneficial, by aiding in the monitoring of the Agreement. If the Subcommittee determines that consultations could be beneficial, it will recommend to the TPSC and to the USTR that such consultations be initiated.

The Subcommittee and the WGI may, in carrying out the functions and procedures set forth herein, consult with U.S. commercial launch services providers, launch vehicle and satellite manufacturers, and, as appropriate, interested Congressional committees, the user community, and other interested parties, including the relevant private sector advisory committees. Such contacts will be made in conjunction with the information collection and assessments referred to herein and U.S. preparation for, and follow-up on the results of, meetings with Russia held under the Agreement. The Subcommittee will also, as appropriate, inform such interested parties of significant requests or notifications made by Russia under the Agreement, or significant developments under the Agreement.

E. Information Sharing

In the course of consulting with interested parties, in particular prior to annual consultations under the Agreement, the U.S. Government may provide such information provided by Russia as is allowed and appropriate under the Agreement, subject to business confidentiality.

F. Collection of Information

DOT, as Chair of the WGI, will have primary responsibility for soliciting and receiving relevant information, and will maintain data to be collected and reviewed by the WGI for purposes of this Agreement.

Members of the U.S. industry, and other interested members of the public, are invited to submit written comments on issues related to the Agreement and its operation. Comments must be provided in twenty copies to the DOT Office of Commercial Space Transportation, Attention: Working Group on Information for Russian Space Launch Services, 400 7th Street, SW., room 5408, Washington, DC 20590-0001.

Submissions from the public will be placed in a file open to public inspection at the above address pursuant to 15 CFR 12003.5, except confidential business information exempt from public inspection in accordance with 15 CFR 2003.6. Confidential business information submitted in accordance with 15 CFR 2003.6 must be clearly marked "Business Confidential" at the top of the cover page or letter and each succeeding page, and must be accompanied by a nonconfidential summary of the confidential information.

G. Enforcement

If the Subcommittee is of the view that the provisions of the Agreement have been violated as a result of information obtained in any annual or special consultation and review required under Article VII of the Agreement or on the basis of information presented to it by the WGI, the Subcommittee will notify the TPSC and recommend consultations with Russia. If consultations proceed and satisfactory resolution is not achieved with Russia, or if consultations are deemed to be inappropriate in the circumstances, based on recommendations of the Subcommittee, the Section 301 Committee may be requested to review the case.

The USTR will, from time to time, advise the Secretary of State and the Secretary of Commerce of the status of the implementation of the agreement in order that this information may be available to the Secretaries with respect to the State Department export license responsibilities under the Arms Export Control Act and the implementing regulations, the International Traffic in Arms Regulations, 22 CFR parts 120-130 and the Commerce Department export license responsibilities under the Export Administration Act.

Frederick L. Montgomery,

Chairman, Trade Policy Staff Committee.

[FR Doc. 94-5498 Filed 3-9-94; 8:45 a.m.]

STATUS OF INTERNATIONAL AGREEMENTS RELATING TO ACTIVITIES IN OUTER SPACE*

UNITED NATIONS TREATIES

1. 1967 OST - Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty)

Adoption by the UN General Assembly:	19 December 1966 (Resolution: 2222 (XXI))
Opened for signature:	27 January 1967, London, Moscow, Washington
Entry into force:	10 October 1967
Depositary:	Russian Federation, United Kingdom United States

(Sources: 18 UST¹ 2410; TIAS² 6347; 610 UNTS³ 205)

2. 1968 ARRA - Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (Rescue Agreement)

Adoption by the UN General Assembly:	19 December 1967 (Resolution: 2345 (XXII))
Opened for signature:	22 April 1968, London, Moscow, Washington
Entry into force:	3 December 1968
Depositary:	Russian Federation United Kingdom United States

(Sources: 19 UST 7570; TIAS 6599; 672 UNTS 119)

*As of March 1994, U.N. doc. A/AC/105/572.

¹United States Treaties and Other International Agreements

²Treaties and Other International Acts Series

³United Nations Treaties Series

3. 1972 LIAB - Convention on International Liability for Damage Caused by Space Objects (Liability Convention)

Adoption by the UN General Assembly: 29 November 1971
(Resolution: 2777 (XXVI))
Opened for signature: 29 March 1972,
London, Moscow, Washington
Entry into force: 1 September 1972
Depositary: Russian Federation
United Kingdom
United States

(Sources: 24 UST 2389; TIAS 7762; 961 UNTS 187)

4. 1975 REG - Convention on Registration of Objects Launched into Outer Space (Registration Convention)

Adoption by the UN General Assembly: 12 November 1974
(Resolution: 3235 (XXIX))
Opened for signature: 14 January 1975, New York
Entry into force: 15 September 1976
Depositary: UN Secretary-General

(Sources: 28 UST 695; TIAS 8480; 1023 UNTS 15)

5. 1979 MOON - Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement)

Adoption by the UN General Assembly: 5 December 1979
(Resolution: 34/68))
Opened for signature: 18 December 1979, New York
Entry into force: 11 July 1984
Depositary: UN Secretary-General

(Sources: 18 ILM⁴ 1434; 1363 UNTS 3)

⁴International Legal Materials

OTHER AGREEMENTS**GENERAL****6. 1963 NTBT - Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water**

Opened for Signature:	5 August 1963, Moscow
Entry into force:	10 October 1963
Depositary:	Russian Federation United Kingdom United States

(Sources: 14 UST 1313; TIAS 5433; 480 UNTS 43)

7. 1974 BRUS - Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite (Brussels Convention)

Opened for signature:	21 May 1974, Brussels
Entry into force:	25 August 1979
Depositary:	UN Secretary-General

(Sources: 1144 UNTS 3)

INSTITUTIONS**8. 1971 INTL - Agreement Relating to the International Telecommunications Satellite Organization (INTELSAT) with annexes, and Operating Agreement Relating to the International Telecommunications Satellite Organization with annex**

Opened for signature:	20 August 1971, Washington
Entry into force:	12 February 1973
Depositary:	United States

(Sources: 23 UST 3813, 4091; TIAS 7532)

9. 1971 INTR - Agreement on the Establishment of the INTERSPUTNIK International System and Organization of Space Communications

Opened for signature:	15 November 1971, Moscow
Entry into force:	12 July 1972
Depositary:	Russian Federation

(Sources: 862 UNTS 3)

10. 1975 ESA - Convention for the Establishment of a European Space Agency (ESA) with annexes

Opened for signature:	30 May 1975, Paris
Entry into force:	30 October 1980
Depositary:	France

(Sources: 14 ILM 864)

11. 1976 ARBS - The Agreement of the Arab Corporation for Space Communications (ARABSAT)

Opened for signature:	14 April 1976, Cairo (Wednesday 14 Rabi Al Akhar 1396 H.)
Entry into force:	16 July 1976
Depositary:	The Arab League

(Sources: Space Law and Related Documents, U.S. Senate, 101st Congress, 2nd Session, 395 (1990))

12. 1976 INTC - Agreement on Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes (INTERCOSMOS)

Opened for signature:	13 July 1976, Moscow
Entry into force:	25 March 1977
Depositary:	Russian Federation

(Sources: 16 ILM 1)

13. 1976 INMR - Convention on the International Maritime Satellite Organization (INMARSAT) with annex, and the Operating Agreement on the International Maritime Satellite Organization with annex

Opened for signature:	3 September 1976, London
Entry into force:	16 July 1976
Depositary:	IMO Secretary-General

(Sources: 31 UST 1; TIAS 9605)

14. 1982 EUTL - Convention Establishing the European Telecommunications Satellite Organization (EUTELSAT)

Opened for signature:	15 July 1982, Paris
Entry into force:	1 September 1985
Depositary:	France

(Sources: UK Misc. No.4, Cmnd. 9154 (1984))

15. 1983 EUMT - Convention for the Establishment of a European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)

Opened for signature:	24 May 1983, Geneva
Entry into force:	19 June 1986
Depositary:	Switzerland

(Sources: Germany, "Bundesgesetzblatt", Jahrgang 1987, Teil 11, p.256 (1987). This Convention has been published in the national bulletins of the ratifying States.)

NOTE: Coded entries are used in the table as follows:

R	=	ratification, acceptance, approval, accession or succession
S	=	signature only
D	=	declaration of acceptance of rights and obligations

When no entry is made in a column opposite a state's name, that state has not signed that agreement, or is not a party to it, or that state has withdrawn from the agreement.

**STATUS OF INTERNATIONAL AGREEMENTS RELATING TO
ACTIVITIES IN OUTER SPACE
(as of March 1994)
UNITED NATIONS TREATIES**

STATE	(1) 1967 OST	(2) 1968 ARRA	(3) 1972 LIAB	(4) 1975 REG	(5) 1979 MOON
Afghanistan	R				
Albania					
Algeria	R		S		
Angola					
Antigua and Barbuda	R	R	R	R	
Argentina	R	R	R	R	
Armenia					
Australia	R	R	R	R	R
Austria	R	R	R	R	R
Azerbaijan					
Bahamas	R	R			
Bahrain					
Bangladesh	R				
Barbados	R	R			
Belarus	R	R	R	R	
Belgium	R	R	R	R	
Benin	R		R		
Bhutan					
Bolivia	S	S			
Bosnia and Herzegovina					
Botswana	S	R	R		
Brazil	R	R	R		
Brunei Darussalam					
Bulgaria	R	R	R	R	
Burkina Faso	R				

OTHER AGREEMENTS									
(6) 1963 NTBT •	(7) 1974 BRUS	(8) 1971 INTL	(9) 1971 INTR	(10) 1975 ESA •	(11) 1976 ARBS •	(12) 1978 INTC	(13) 1976 INMR	(14) 1982 EUTL	(15) 1983 EUMT
R		R	R						
								R	
R		R			R		R		
		R							
R									
R	R	R					R		
	R	R						R	
R	R	R					R		
R	R	R		R				R	
		R						R	
R		R							
		R			R		R		
R		R					R		
		R							
R							R		
R	S	R		R			R	R	R
R		R							
R		R							
R		R							
								R	
R									
R	S	R					R		
							R		
R			R			R	R		
S		R							

STATE	(1) 1967 OST	(2) 1968 ARRA	(3) 1972 LIAB	(4) 1975 REG	(5) 1979 MOON
Burundi	S		S	S	
Cambodia			S		
Cameroon	S	R			
Canada	R	R	R	R	
Cape Verde					
Central African Rep.	S		S		
Chad					
Chile	R	R	R	R	R
China	R	R	R	R	
Colombia	S	S	S		
Congo					
Costa Rica		S	S		
Côte d'Ivoire					
Croatia					
Cuba	R	R	R	R	
Cyprus	R	R	R	R	
Czech Republic	R	R	R	R	
Dem. People's Rep. of Korea					
Denmark	R	R	R	R	
Djibouti					
Dominican Republic	R	S	R		
Ecuador	R	R	R		
Egypt	R	R	S		
El Salvador	R	R	S		
Equatorial Guinea	R				
Ethiopia	S				
Fiji	R	R	R		
Finland	R	R	R		
France	R	R	R	R	S

(6) 1963 NTBT	(7) 1974 BRUS	(8) 1971 INTL	(9) 1971 INTR	(10) 1975 ESA	(11) 1976 ARBS	(12) 1976 INTC	(13) 1976 INMR	(14) 1982 EUTL	(15) 1983 EUMT
S									
S		R					R		
R		R		(1)			R		
R		R							
R		R							
R		R							
R		R					R		
		R					R		
R		R					R		
		R							
R		R							
R	S	R							
	R	R					R	R	
			R			R	R		
R	S	R					R	R	
R		R	R			R	R	R	
			R						
R		R		R			R	R	R
					R				
R		R							
R		R							
R		R			R		R		
R		R							
R									
S		R							
R		R							
R		R		(2)			R	R	R
	S	R		R			R	R	R

STATE	(1) 1967 OST	(2) 1968 ARRA	(3) 1972 LIAB	(4) 1975 REG	(5) 1979 MOON
Gabon		R	R		
Gambia	S	R	S		
Georgia					
Germany	R	R	R	R	
Ghana	S	S	S		
Greece	R	R	R		
Guatemala			S		S
Guinea					
Guinea-Bissau	R	R			
Guyana	S	R			
Haiti	S	S	S		
Holy See	S				
Honduras	S		S		
Hungary	R	R	R	R	
Iceland	R	R	S		
India	R	R	R	R	S
Indonesia	S				
Iran (Islamic Rep. of)	S	R	R	S	
Iraq	R	R	R		
Ireland	R	R	R		
Israel	R	R	R		
Italy	R	R	R		
Jamaica	R	S			
Japan	R	R	R	R	
Jordan	S	S	S		
Kenya	R		R		
Kuwait	R	R	R		
Lao People's Dem. Rep.	R	R	R		
Lebanon	R	R	S		

(6) 1963 NTBT	(7) 1974 BRUS	(8) 1971 INTL	(9) 1971 INTR	(10) 1975 ESA	(11) 1976 ARBS	(12) 1976 INTC	(13) 1976 INMR	(14) 1982 EUTL	(15) 1983 EUMT
R		R					R		
R									
							R	R	
R	R	R	R	R			R	R	R
R		R							
R	R	R					R	R	R
R		R							
		R							
R									
S		R							
		R						R	
R		R							
R		R	R			R		R	
R		R					R	R	
R		R					R		
R		R					R		
R		R					R		
R		R			R		R		
R		R		R				R	R
R	S	R					R		
R	R	R		R			R	R	R
R		R							
R		R					R		
R		R			R				
R	R	R							
R		R			R		R		
R			R						
R	S	R			R				

STATE	(1) 1967 OST	(2) 1968 ARRA	(3) 1972 LIAB	(4) 1975 REG	(5) 1978 MOON
Lesotho	S	S			
Liberia					
Libyan Arab Jamahiriya	R				
Liechtenstein			R		
Lithuania					
Luxembourg	S	S	R		
Madagascar	R	R			
Malawi					
Malaysia	S	S			
Maldives		R			
Mali	R		R		
Malta		S	R		
Mauritania					
Mauritius	R	R			
Mexico	R	R	R	R	R
Micronesia, Federated States of					
Monaco		S			
Mongolia	R	R	R	R	
Morocco	R	R	R		R
Mozambique					
Myanmar	R	S			
Namibia					
Nepal	R	R	S		
Netherlands	R	R	R	R	R
New Zealand	R	R	R		
Nicaragua	S	S	S	S	
Niger	R	R	R	R	
Nigeria	R	R			
Norway	R	R	S		

(6) 1963 NTBT	(7) 1974 BRUS	(8) 1971 INTL	(9) 1971 INTR	(10) 1975 ESA	(11) 1976 ARBS	(12) 1976 INTC	(13) 1976 INMR	(14) 1982 EUTL	(15) 1983 EUMT
R							R		
R		R			R				
		R						R	
								R	
R		R						R	
R		R							
R		R							
R		R					R		
S		R							
R							R	R	
R		R			R				
R		R					R		
R	R	R					R		
		R							
		R					R	R	
R			R			R			
R	R	R			R				
		R					R		
R									
		R							
R		R							
R		R		R			R	R	R
R		R					R		
R	R	R	R						
R		R							
R		R					R		
R		R		R			R	R	R

STATE	(1) 1967 OST	(2) 1968 ARRA	(3) 1972 LIAB	(4) 1975 REG	(5) 1979 MOON
Oman			S		
Pakistan	R	R	R	R	R
Panama	S		R		
Papua New Guinea	R	R	R		
Paraguay					
Peru	R	R	S	R	S
Philippines	S	S	S		R
Poland	R	R	R	R	
Portugal		R			
Qatar			R		
Rep. of Korea	R	R	R	R	
Romania	R	R	R		S
Russian Federation	R	R	R	R	
Rwanda	S	S	S		
Samoa					
San Marino	R	R			
Saudi Arabia	R		R		
Senegal		S	R		
Seychelles	R	R	R	R	
Sierra Leone	R	S	S		
Singapore	R	R	R	S	
Slovak Republic	R	R	R	R	
Slovenia		R	R		
Somalia	S	S			
South Africa	R	R	S		
Spain	R		R	R	
Sri Lanka	R		R		
Sudan					
Swaziland		R			

(6) 1963 NTBT	(7) 1974 BRUS	(8) 1971 INTL	(9) 1971 INTR	(10) 1975 ESA	(11) 1976 ARBS	(12) 1976 INTC	(13) 1976 INMR	(14) 1982 EUTL	(15) 1983 EUMT
		R			R		R		
R		R					R		
R	R	R					R		
R		R							
S		R							
R	R	R					R		
R		R					R		
R		R	R			R	R	R	
S		R					R	R	R
		R			R		R		
R		R					R		
R		R	R			R	R	R	
R	R	R	R			R	R		
R		R							
R									
R								R	
		R			R		R		
R	S	R							
R									
R									
R		R					R		
							R	R	
R	R								
S		R			R				
R		R					R		
R	S	R		R			R	R	R
R		R					R		
R		R			R				
R		R							

STATE	(1) 1967 OST	(2) 1968 ARRA	(3) 1972 LIAB	(4) 1975 REG	(5) 1979 MOON
Sweden	R	R	R	R	
Switzerland	R	R	R	R	
Syrian Arab Rep.	R	R	R		
Thailand	R	R			
Togo	R		R		
Tonga	R	R			
Trinidad and Tobago	S		R		
Tunisia	R	R	R		
Turkey	R	S			
Uganda	R				
Ukraine	R	R	R	R	
United Arab Emirates					
United Kingdom	R	R	R	R	
United Rep. of Tanzania			S		
United States	R	R	R	R	
Uruguay	R	R	R	R	R
Venezuela	R	S	R		
Viet Nam	R				
Yemen	R	R			
Yugoslavia	S	R	R	R	
Zaire	S	S	S		
Zambia	R	R	R		
Zimbabwe					
ORGANIZATION					
European Space Agency (ESA)		D	D	D	
European Telecommunications Satellite Org. (EUTELSAT)			D		

(6) 1963 NTBT	(7) 1974 BRUS	(8) 1971 INTL	(9) 1971 INTR	(10) 1975 ESA	(11) 1976 ARBS	(12) 1976 INTC	(13) 1976 INMR	(14) 1982 EUTL	(15) 1983 EUMT
R		R		R			R	R	R
R	R	R		R			R	R	R
R		R			R				
R		R							
R		R							
R									
R		R							
R		R			R		R		
R		R					R	R	R
R		R							
R							R		
		R			R		R		
R		R		R			R	R	R
R		R							
R	R	R					R		
R		R							
R		R							
		R	R			R			
R		R	R		R				
R	R	R						R	
R		R							
R		R							
		R							

* Status as of March 1993

¹ Canada has a Cooperation Agreement with ESA, but is not a Member.

² Finland is an Associate Member of ESA.

U.S.-RUSSIAN JOINT COMMISSION ON ECONOMIC AND TECHNOLOGICAL COOPERATION

Joint Statement on Space Station Cooperation

In accordance with the June 17, 1992 Agreement between the United States of America and the Russian Federation Concerning Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes, and the understandings reached at the Russian-American Joint Commission on Economic and Technological Cooperation which met in Moscow on December 15-16, 1993, the U.S. and Russian Governments note with deep satisfaction the considerable progress made to date in their joint effort to expand cooperation in human space flight.

In furtherance of their mutual desire to strengthen cooperation in space, the U.S. and Russian Governments note the following milestones which have been jointly achieved since the December 1993 Joint Commission meeting:

- January - April 1994: Russian docking module model was received for testing in the U.S., U.S. solar array components were shipped to Russia as part of a joint development program and U.S. scientific equipment was shipped to Russia for launch on Progress and for integration into the Russian Spektr laboratory of the Mir space station.
- February 1994: The flight of the first Russian cosmonaut on the U.S. Space Shuttle was conducted. Flight preparations are underway to fly a second Russian cosmonaut on Shuttle.
- March 1994: Two U.S. astronauts commenced training at Star City in Russia for a mission on the Mir space station in early 1995.
- March 1994: The Space Station System Design Review, a major program milestone involving the participation of all Space Station partners and Russia, was successfully completed.
- April 1994: Formal government-level negotiations commenced, with Russian participation, on the Protocol amending the 1988 Space Station Intergovernmental Agreement.
- June 1994: Joint crew training, in preparation for the May 1995 Shuttle-Mir docking mission, was completed at the Johnson Space Center in Houston, Texas.
- June 23, 1994: The NASA/RSA Interim Agreement was signed, which provides for RSA participation in international Space Station activities pending conclusion of the Protocol to the 1988 Space Station Intergovernmental Agreement.
- June 23, 1994: A definitized Contract Agreement was signed between the NASA and RSA for \$400M of goods and services to be provided during Shuttle-Mir operations and during the early international Space Station assembly phase. Funds will be provided to conduct joint scientific research in the framework of the U.S.-Russian human space flight program.

The U.S. and Russian Governments express their firm commitment to develop an integrated Space Station and to expedite the process for Russian involvement in the international Space Station as a full partner. In this

regard, the two governments directed their appropriate organizations to continue efforts that will lead to conclusion of the Protocol to the Intergovernmental Agreement and a NASA/RSA Memorandum of Understanding on space station cooperation. They also directed NASA and RSA to intensify their efforts to implement the program. NASA and RSA are to complete arrangements for establishing their respective liaison offices in Houston, Texas, and in Moscow no later than September 1994.

Both space agencies have reaffirmed their resolve to complete the preparations for the early 1995 joint missions including a Shuttle mission to fly around the Mir station in February, the launch of a joint crew onboard a Russian Soyuz spacecraft to the Mir space station in March, and the first Space Shuttle docking with the Mir space station in May-June. NASA and RSA reaffirm their decision to meet all milestones necessary to achieve Space Station First Element Launch in November 1997, including completion of top level technical documentation by August 31, 1994, completion of an incremental design review in September 1994, and the Critical Design Review in March 1995.

In carrying out bilateral cooperation, the Governments of both countries encourage industry-to-industry cooperation. For example, U.S. and Russian firms are working together on modifications to the Shuttle Orbiter to utilize a Russian-developed docking mechanism on future Shuttle missions to Mir. In addition, the FGB Energy Block, which will be used for guidance, navigation and reboost on the international Space Station, will be procured through a contractual arrangement between a U.S. firm and a Russian enterprise.

In the area of science utilization, the U.S. and Russian Governments note with satisfaction that several important milestones have been achieved since the December 1993 Joint Commission meeting:

- The U.S./Russian Joint Working Group on Space Biomedicine, Life Support Systems and Microgravity Sciences met in Moscow in March 1994, and agreed to expand its efforts to include the areas of strategic planning and coordination between scientific communities of each side to enhance future cooperation in orbital research involving human and robotic space flight, including research on the international Space Station.

- The Joint Mission Science Working Group established under the 1992 Human Space Flight Agreement met in Moscow in April 1994 and continued to work on defining the overall program of planned joint research in the areas of life and microgravity sciences and applications for the upcoming Shuttle/Mir missions, as the first phase of the international Space Station program.

The U.S. and Russian Governments are delighted by the work done thus far to expand U.S.-Russian human space cooperation and to lay the foundation for Russia's full participation in the international Space Station. The U.S. and Russian Governments remain committed to this historic endeavor.

Signatures.

Washington, D.C., June 23, 1994

INDEX TO VOLUME 22*

- Aeronautics, 61.
- Aerospace Plane, 58-60.
- Aerospace Systems, 57-73.
- Appalachian Insurance Co. v. McDonnell Douglas*, 77-81.
- Arianespace, 103-104, 111.
- Astronauts/Cosmonauts, 109-110, 161-162.
- "Benefits and Interests", 125-126.
- Book Reviews/Notices, 159-163.
 - Diederiks-Verschoor, I.H. Ph., *An Introduction to Space Law* (Stephen Gorove), 159.
 - Masson-Zwann, Tanja L./Mendes de Leon, Pablo M.J., *Air and Space Law: de Lege Ferenda - Essays in Honour of Henri A. Wassenbergh*, 161.
 - Mauldin, John H., *Prospects for Interstellar Travel*, 163.
 - Santy, Patricia A., *Choosing the Right Stuff: The Psychological Selection of Astronauts and Cosmonauts*, 161-162.
 - Stuhlinger, Ernst/Ordway III, Frederick I., *Wernher von Braun - Crusader for Space*, 162.
 - United States Space Foundation, *Proceedings Reports on the Sixth, Seventh, Eighth, and Ninth Space Symposiums*, 162.
 - van Traa-Engelman, H.L., *Commercial Utilization of Outer Space* (Stephen Gorove), 159-161.
- Bostwick, Phillip D., *Liability of Aerospace Manufacturers: MacPherson v. Buick Sputters into the Space Age*, 75-96.
- Brief News, 155-156.
- Buenos Aires Convention of 1952, 27.
- Buran, 59.
- Case Notes, 141-144.
 - Alpha Lyracom Space Communications, Inc. v. Communications Satellite Corporation (COMSAT)*, 141-142.
 - Smith v. United States & Hughes Aircraft Co. v. U.S.*, 142-144.
- Chicago Convention of International Civil Aviation of 1944, 61-63.
- Christol, Carl Q., *Judge Manfred Lachs and the Principle of Jus Cogens*, 33-45.
- Commercial Activities, 82, 149-152, 175-182.
- Congressional Notes, 152.
- Current Documents, 175-201.
- Definition and Delimitation of Outer Space, 122-125, 138-139.
 - Allocative Theory, 70.
 - Spatial Approach, 68-69.
 - Territorial Approach, 68.
- Diederiks-Verschoor, I.H.Ph., *Judge Manfred Lachs: An Obituary*, 1.
- Dunk, von der, Frans G., *Asia Booms in Space!*, 147-149.

* Compiled and edited by Michael A. Gorove, Boston University School of Law.

- Environment, 6-7, 14.
EUMETSAT, 104, 111, 152.
European Centre for Space Law (ESCL), 110-111, 157-158.
European Space Agency (ESA), 8, 97-113, 144-147, 156-158.
EUTELSAT, 111-112, 152, 156.
Executive Developments, 152-153.
Fasan, Dr. Ernst, *Human Settlements on Planets; New Stations or New Nations*, 47-55.
 Legal Questions Regarding Commercial Activities in Outer Space, 149-152.
Forthcoming Events, 156-158.
Geostationary Orbit, 119-120, 122-125, 138-139.
Gorove, Stephen, *Issues of Supreme Authority and Sovereign Rights Arising out of Space Activities*, 126-132.
HOTOL, 60.
Impallomeni, Elisabeth Back, *Implementation of the ESA Convention - Lessons From the Past*, 144-147.
INMARSAT, 151, 156.
Intellectual Property Rights, 108-109, 157-158.
INTELSAT, 29, 156.
International Developments, 153-154, 183-199.
International Institute of Space Law (IISL)
 Colloquium 1994, 157.
 Colloquium 1995, 157.
International Maritime Organization (IMO), 17.
International Telecommunications Union (ITU), 23-32, 101, 112, 156.
Jasentuliyana, N., *Regulation of Space Salvage Operations: Possibilities for the Future*, 5-21.
Jus Cogens and Judge Manfred Lachs, 33-45.
Kopal, Vladimir, *Some Considerations on the Legal Status of Aerospace Systems*, 57-73.
Lafferranderie, Gabriel & Tuinder, Paul Henry, *The Role of ESA in the Evolution of Space Law*, 97-113.
Legislative Initiatives and Policy Developments, 132-135.
Lexington v. McDonnell Douglas, 75-81.
Liability
 Breach of Warranty, 90-92.
 Contract, 92-94.
 Gross Negligence, 87-88.
 Inter-party Waivers of, 77-83.
 Manufacturer's, 75-96.
 Negligence, 85-87.
 Negligent Misrepresentation, 88-90.
 Strict Liability in Tort, 83-85.
Liability Convention of 1972, 66-67.
Lyall, Francis, *The International Telecommunication Union and Development*, 23-32.
MacPherson v. Buick, 75-76.

- Martin Marietta v. INTELSAT*, 82.
Meredith, Pamela L. & English, William D., *Space-Related Legislative Initiatives and Policy Developments*, 132-135.
Montreal Protocol to Amend the 1952 Rome Convention, 65.
Moon Agreement, 140.
Moot Court Competition (Manfred Lachs, IISL), 154
Nairobi Convention of 1982, 27.
NASA, 8, 155.
NASDA, 8, 156.
Nuclear Power Sources, 117-118, 122, 137.
Other Events, 154.
Plenipotentiary Conferences,
 Geneva of 1992, 26, 28.
 Nice of 1989, 25.
 ITU of 1994, 156.
Recent Publications, 164-174.
Registration Convention of 1975, 62.
Remote Sensing, 107-108, 118.
Res Communis, 45.
Responsibility, 9, 160.
Sanidas, Matthew W., *The 1994 Session of the Scientific and Technical Subcommittee of UNCOPUOS Takes Place in a Constructive Atmosphere - Space Debris Issue for the First Time on its Agenda*, 115-120.
Sanidas, Mathew W. & Thaker, Jitendra S., *United Nations Committee on the Peaceful Uses of Outer Space Holds Annual Meeting in Vienna, Austria*, 135-141.
Settlements on Planets, 47-56.
Soft Law, 111.
Sovereignty & Sovereign Rights, 55, 126-132.
Space Applications, UN Programme on, 116-117, 136-137.
Space Debris, 6, 18-20, 106, 118-119, 137-138, 157.
Space Object, 12.
Space Salvage, 5-21.
Space Station, 49-52, 105-106, 108-109, 200-201.
Thaker, Jitendra S., *1994 Session of U.N. Legal Subcommittee on Space Reasonably Successful*, 120-126. See also Sanidas & Thaker.
Thomas v. Winchester, 75.
U.N. Committee on Peaceful Uses of Outer Space, 100, 135-141.
 Legal Subcommittee, 120-126.
 Membership, 141.
 Scientific and Technical Subcommittee, 115-120.
UNISPACE, 115, 120, 140-141.
United Nations Development Program (UNDP), 28.
Warsaw Convention of 1929, 64.
Winterbottom v. Wright, 75-76.
World Administrative Radio Conference (WARC), 15, 27, 30, 101.

ANNOUNCEMENT

We have purchased the reprint rights of

JOURNAL OF SPACE LAW

(Vol. I through Vol. 13)

Complete sets to date are now available.

We can also furnish single volumes and issues.

William S. Hein & Co., Inc.

1285 Main Street

Buffalo, New York 14209

JOURNAL OF SPACE LAW

P.O. Box 308, University, MS 38677

Tel. 601-234-2391 Fax: 601-232-7010

The 1994 subscription rate is \$74.45 (domestic), \$79.95 (foreign)
and \$89.95 (airmail) for two combined issues.

Enclosed please find \$_____ for a one-year subscription.

Name: _____

Address: _____
