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PASSAGE OF SPACE OBJECTS THROUGH FOREIGN AIRSPACE: INTERNATIONAL CUSTOM?

Andrei D. Terekhov*

I. Introduction

The "question of determining where outer space begins" was first identified as a legal problem by the United Nations through its *Ad Hoc* Committee on the Peaceful Uses of Outer Space in 1959.[1]

In 1966, having commended 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 (the Outer Space Treaty),[2] the General Assembly, in the same resolution, requested the Committee on the Peaceful Uses of Outer Space (COPUOS) to begin "the study of questions relative to the definition of outer space."[3] Since that time the item concerning the definition and delimitation of outer space has been on the agenda of the Legal Subcommittee of COPUOS, although for a number of years this subject was not considered due to the lack of time.

Basically, over the years two approaches to the problem have been formulated: the spatial approach and the functional approach. The former advocates establishing a boundary between airspace and outer space, the latter envisages that the function of the object suffices to determine applicable law.

In 1979, 1983 and 1987 respectively, the Soviet Union submitted three proposals suggesting, in essence, the establishment of a boundary between airspace and outer space at an altitude not exceeding 110 kilometers above sea level.[4] However, because COPUOS adopted and

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1 UN doc. A/4141 of 14 July 1959, Part III, III.A.

2 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, 18 U.S.T. 2410, T.I.A.S. 6347, 610 U.N.T.S. 205 (entered into force: 10 October 1967).

3 UN General Assembly resolution 2222(XXI) of 19 December 1966, para. 4b.

4 UN docs. A/AC.105/L.112 of 20 June 1987; A/AC.105/C.2/L.139 of 4 April 1983 and A/AC.105/L.168 of 5 June 1987.

continues to adopt decisions on the basis of consensus, those ideas did not find sufficient support in that body. The debate on the issue, therefore, continued to be deadlocked.

In 1991, at the thirtieth session of the Legal Subcommittee of COPUOS, the Soviet Union, supported by some other delegations, suggested that the Subcommittee should commence, in 1992, "an exchange of views on the international legal aspects of future exploitation of aerospace systems."[5]

Thus, in 1992, the Russian Federation, who continued the membership of the Soviet Union in the United Nations and its various bodies, submitted a working paper entitled "Questions concerning the legal regime for aerospace objects" to the Legal Subcommittee.[6]

In 1995, the Legal Subcommittee formulated a Questionnaire on possible legal issues with regard to aerospace objects (hereafter - UN Questionnaire) and recommended that it should be circulated to the States Members of COPUOS.[7] One of the questions included in the Questionnaire was whether there were precedents of the passage of aerospace objects after re-entry into the Earth's atmosphere and whether international customary law existed with respect to such passage.

The purpose of this paper is to attempt to provide an answer to the question whether or not there exists international customary law with respect to the passage of aerospace and space objects through foreign airspace after re-entry into Earth's atmosphere.

II. Definition of custom in international law

Black's Law Dictionary defines "custom and usage" as:

> A usage or practice of the people, which, by common adoption and acquiescence, and by long and unvarying habit, has become compulsory, and has acquired the force of a law with respect to the place or the subject-matter to which it relates. It results from a long series of actions, constantly repeated, which have, by such repetition and by uninterrupted acquiescence, acquired the force of a tacit and common consent.[8]

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5 UN doc. A/AC.105/484 of 17 April 1991, Annex II, para. 9.

6 UN doc. A/AC.105/C.2/L.189 of 30 March 1992, reproduced in A/AC.105/514 of 20 April 1992, Annex IV.B.

7 UN doc. A/AC.105/607 of 19 April 1995, para. 38 and Annex I, Appendix.

8 BLACK'S LAW DICTIONARY 385 (6th ed. 1990).

The Dictionary of International Law defines "international legal custom" as: "A rule of behavior established in the international practice which is recognized by subjects of international law as having a legally binding character."[9]

In the framework of international jurisprudence, according to Article 38 of the Statute of the International Court of Justice, "international custom" is characterized "as evidence of a general practice accepted as law."

Among notable legal commentators on the concept of "custom", V.S. Vereshchetin and G.M. Danilenko observed that:

> As a specific norm-creating procedure, international custom is based on the constant and uniformed practice of states. The emergence of a constant and uniform state practice in a new field of international relations, which requires legal regulation, leads to the establishment of new rules of customary international law if certain requirements laid down by international law are met. Those requirements include those of generality, consistency, uniformity and *opinio juris*.[10]

III. Precedents

In view of the foregoing, before examining whether "custom" exists with regard to the passage of aerospace or space objects through foreign airspace after re-entry into Earth's atmosphere, it is necessary to examine existing precedents in this area. Since no vehicles reaching outer space through horizontal take-off (similar to aircraft) have been developed so far, the passage of space objects through airspace could only happen during their landing phase. While the comprehensive information on specific cases of such passages is not readily available, this author came across the following data.

There were reports in the 1960s that some of space probes of the Soviet Union passed through the airspace of adjacent states for the purpose of landing in the territory of the Soviet Union.[11]

Another reported case was the landing of the space shuttle "Challenger" on 13 October 1984, when it crossed the US-Canadian air border at an altitude of 222,000 feet or approximately 68 kilometers, on its way to landing in US territory.[12]

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9 DICTIONARY OF INTERNATIONAL LAW 241 (in Russian) (2d ed. Moscow 1986)

10 V.S. Vereshchetin & G.M. Danilenko, *Custom as a Source of International Law of Outer Space*, 13 J. SPACE L. 24 (1985).

11 Izvestia, April 11, 1969, cited in *supra* note 10, at 28.

12 122 AV.WK.& SPACE TECH. 24 (1984), cited in *supra* note 10, at 28.

In its response to the above-mentioned UN Questionnaire on aerospace objects (which will be examined in more details below), Germany referred to the flight, on 15 November 1988, of the Soviet space transportation system "Buran" which passed through foreign airspace during landing.[13]

Unfortunately, from these reports it is not clear whether the overflown states were aware of the above flights through their airspace and whether any bilateral contacts between the states concerned took place either prior to or after the flights.

In terms of prior notification, one noteworthy precedent was described by the Russian Federation in its response to the UN Questionnaire as follows:

> ... in March 1990 the United States of America communicated to the USSR information regarding the final flight stage of the Atlantis multi-use craft. The information furnished contained general data on the trajectory of the planned flight of the shuttle above a specific swathe of eastern regions of the USSR and indicated the period of time during which the craft was expected to be located above the territory of the Soviet Union during its descent from the orbit, its minimum flight altitude in the airspace before its entry into the Earth's atmosphere above open sea, and technical details of the craft's state. Information received only a few hours before the overflight took place was transmitted as a courtesy. An agreement was reached establishing that the fact that this information was furnished should not be deemed to set a precedent.[14]

IV. Doctrine

Taking into consideration the fact that precedents exist with regard to the passage of foreign space objects in the airspace of states, various commentators in the space law field have offered numerous views as to the legal nature of such passage as well as an analysis of existing law applicable to these situations. Among these are Vereshchetin and Danilenko referred to above, who wrote that:

> Although the existing practice concerning the passage of space objects through foreign air space is not yet able to create a general rule of customary international law, because of its local nature, it is quite possible that this practice has given rise to a local or particular custom

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13 *See* UN doc. A/AC.105/635 of 15 February 1996, at 10-11.

14 UN doc. A/AC.105/635/Add.1 of 15 March 1996, at 4-5.

> governing the relations of neighboring states. In the course of time, and with the development and consolidation of general, constant and uniform state practice in the field of passage of space objects, this local custom may be gradually transformed into a general rule of customary law that is binding upon all states.[15]

Gorove made the following observation:

> The principle of the freedom of exploration and use of outer space, a cardinal principle of the 1967 Outer Space Treaty, in a sense implies the freedom to go into outer space and also the freedom to return to earth from outer space. Because of the very limited number of space flights that might have traversed through the airspace of foreign state the exact nature and scope of this freedom has so far not been determined by international customary law.[16]

Haanappel expressed the view that "there is no conventional and probably also no customary rule of innocent passage for an aerospace plane en route from earth to outer space and back."[17]

Kopal indicated that "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."[18]

Cheng wrote that "land-locked countries have no... right of transit for its space objects on their way to or back from outer space through the territorial space of other States. Nor can a rule of customary international law be said to have grown up granting such a right."[19]

Lachs made the following remark:

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[15] *Supra* note 10, at 29. Unfortunately the authors did not indicate in which particular location or locations such "local" custom may have developed in the relations of neighboring states.

[16] S. Gorove, *Aerospace Plane: New Policy Issues for Space Law*, 31 PROC. COLLOQ. L. OUTER SPACE [hereafter - PROC.] 283 (1989).

[17] P.P.C. Haanappel, *The Aerospace Plane: Analogies with Other Modes of Transportation*, 32 PROC. 342 (1990).

[18] V. Kopal, *Some Considerations on the Legal Status of Aerospace Systems*, 22 J. SPACE L. 64 (1994) .

[19] Bin Cheng, *The Legal Regime of Airspace and Outer Space: the Boundary Problem. Functionalism versus Spatialism: the Major Premises*, 5 ANNALS AIR & SPACE L. 357 (1980).

> On the first day a manmade vehicle reached outer space a legal question arose concerning its passage through the airspace of other countries. On many occasions the object moved through the airspace of the launching state, but it may have travelled over other lands. These were never asked for permission to cross their airspace and never protested against the journey through it. Thus one might assume that a customary law has developed: of innocent passage into outer space.[20]

Masson-Zwaan stated that she "is not convinced that... a customary rule of innocent passage of space objects through the airspace of foreign states does exist."[21]

Besides individual experts in the international space law community, organizations, committees and groups have also added their collective voice to the debate. In November 1993, members of the Space Committee of the American Branch of the International Law Association (Stephen Gorove, Harry H. Almond, Jr., Carl Q. Christol, Paul G. Dembling and Edward R. Finch, Jr.) responded to a questionnaire concerning various issues of passage of space objects and aerospace objects through foreign airspace.[22] This initiative of Stephen Gorove, Chairman of the Space Committee, was obviously undertaken in view of the developments in the Legal Subcommittee of COPUOS where the idea of a questionnaire was introduced and a preliminary draft was being considered. That is why the Space Committee's questionnaire is almost identical to that of the Legal Subcommittee which was finalized two years later.

A detailed analysis of all the views of the above five distinguished legal experts of the Space Committee is beyond the scope of this paper. However, of direct relevance to the analysis of the present author was the question which was formulated as follows: "Does international customary law exist 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 (*e.g.*, non-accidental) conditions?".

Responding to that question, Gorove noted that:

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[20] Manfred Lachs, *Freedom of the Air - the Way to Outer Space, in* "AIR AND SPACE LAW: *DE LEGE FERENDA*. ESSAYS IN HONOUR OF HENRI A. WASSENBERGH" 244 (T. L.Masson-Zwaan & P.M.J. Mendes de Leon, eds., Nijhoff 1992) [hereafter - ESSAYS].

[21] T. L. Masson-Zwaan, *The Aerospace Plane: an Object at the Cross-roads between Air and Space Law, in* ESSAYS, at 253.

[22] PROC. AMERICAN BRANCH OF THE INTERNATIONAL LAW ASSOCIATION, 1993-1994, Report of the Space Law Committee, ILA, Am. Branch, at 105-133.

> States have not objected to the flight of artificial earth satellites above their territories in outer space nor to the ascent or descent of foreign space objects though undoubtedly some of these may have passed through their territorial air spaces. It is not certain how many times such a passage may have occurred since the upper boundary of national territorial air space so far has not been determined by international agreement or international customary law. If there is an international customary law, it is based on common perceptions and shared expectations of international authoritative decision-makers regarding such passage and supported by cardinal principle of freedom of exploration and use of outer space embedded in the Outer Space Treaty of 1967 and generally recognized to the extent and in line with existing state practice.[23]

In response to another question however, Gorove indicated that, "to the extent that States have not objected to the flight of artificial satellites above their territories in outer space nor to the ascent or descent of space objects through their national air spaces in the situations where such have occurred, a limited international custom with legal implications seems to have emerged (emphasis added - A.T.).[24]

In the opinion of Almond, "the current customary international law has not been fully established as to the regulation of the passage of space objects through foreign airspace, even including the ascent or descent of space objects."[25]

Christol provided the following answer: "If the question is whether a space object has the right under customary international law to transit through foreign sovereign airspace while the space object is engaged in ascent from the territory of a launching/procuring State and while returning to the territory of a launching/procuring State, the answer is `Yes'."[26]

Dembling answered that "taken literally, I would say that customary international law does not apply with respect to the passage of space objects during ascent or descent from outer space."[27]

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23 *Id.* at 110-111.

24 *Id.* at 114.

25 *Id.* at 111. Almond's response also contains interesting remarks on the origin and evolution of customary international law in general.

26 *Id.* at 112.

27 *Id.*

Finch's answer was the briefest: "Yes."[28]

V. UN Questionnaire on aerospace objects

In accordance with the decision of COPUOS, the Questionnaire was only circulated to members of COPUOS which is currently comprised of 61 States. At the time of the writing of this paper 14 substantive[29] responses had been received by the UN.

In the Questionnaire, Question 7 read as follows: "Are there precedents with respect to the passage of aerospace objects after re-entry into the Earth's atmosphere and does international customary law exist with respect to such passage?".

In response to that question, the following views were communicated to the United Nations Secretariat by Member States.

The Czech Republic indicated that, "in the doctrine of space law there has not yet been sufficient support for the conclusion that the right of passage for the ascending or descending space objects has been generally recognized as a customary rule of international law. In practice, however, such passage occurs and no protests against it have been raised so far."[30]

Germany stated that, "no international customary law exists with respect to the passage of space transportation systems *over foreign territory*, since no international practice in this respect exists."[31]

Iraq responded that "no such precedents are traced with respect to Iraq."[32]

In the opinion of Mexico, such "precedents exist and examples include the falling of space objects in Canada and Australia, among others."[33]

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28 *Id.*

29 United Kingdom of Great Britain and Northern Ireland sent an intermediate response as follows: "The Government of the United Kingdom acknowledges the importance of the subject and the future possible implications of considering legal issues in this area of aerospace objects, but regrets to inform the Secretary-General that the questionnaire is still under active discussion in both national and European contexts. The matter will be kept under close review and an agreed response to the questionnaire will be forwarded to the Committee on the Peaceful Uses of Outer Space in due course." (UN doc. A/AC.105/635/Add.3 of 1 December 1996, at 11).

30 *Supra* note 13, at 10.

31 *Id.* at 11.

32 *Id.*

33 *Id.*

Pakistan stated that "there are several examples of such incidents" including "re-entry of Apollo 13/SNAP 27... in 1970," "the falling down of the Soviet NPS-carrying satellite COSMOS-954 on 24 January 1978...," "reentry of Skylab" in 1979, "accident of COSMOS-1402 in 1982-83." Pakistan also stated that "no specific international customary law exists, to our knowledge, with respect to such passage of aerospace objects over foreign territories."[34]

The Philippines reported that "it is not aware of any precedent with respect to the passage of aerospace objects after re-entry into Earth's atmosphere."[35]

The Republic of Korea's position was that "there are no international customary laws or precedents with respect to the passage of an aerospace object after re-entry in to the Earth's atmosphere" (emphasis added). As for the space objects, the Republic of Korea's response indicated that

> Until now many space objects were launched into outer space, but it does not mean that its passage over [perhaps what is meant here and in the next sentence is "through" not "over" - A.T.] airspace after re-entry into the Earth's atmosphere constitutes any precedent or customary law. The fact that most of the countries did not raise any objection to the passage of space objects over their airspace does not signify their approval of the passage as international practice or precedents; they just did not have information about the passage and there was no special perceptible disadvantage with the passage at that time.[36]

In the view of the Russian Federation,

> There are such precedents [of the passage of aerospace objects after re-entry into Earth's atmosphere. - A.T.]. According to the international practice which is now evolving, a State's sovereignty does not extend to the space located above the orbit of least perigee of an artificial Earth satellite (approximately 100 km above sea level). There have been relatively few instances of space objects flying over territories of foreign States. In cases where the object has flown at an altitude below the above-mentioned level, the registering States have furnished the relevant information to the States whose territory was thus overflown

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34 *Id.*

35 *Id.*

36 *Supra* note 14, at 6.

> on the basis of goodwill. For example, [then followed the text describing the March 1990 Atlantis flight over the USSR - see above - A.T.]

The response of the Russian Federation continued by stating that "provisions of international customary law with respect to the passage of aerospace objects after re-entry into the Earths atmosphere are currently in the process of being elaborated" ("in the process of being elaborated" is an imprecise translation from Russian; the better translation is "evolving" - A.T.).[37]

Responding to the question concerning precedents and customary law, Italy expressed the opinion that "the issue should be re-examined keeping into account solutions mentioned at points 2 and 6."[38]

Chile stated that "there are indeed precedents relating to aerospace objects, such as space shuttles, in respect of their aerodynamic characteristics. Similarly, customary law does exist with respect to such aerospace objects, whereby they are regarded as craft performing a space mission to which the norms of air law do not apply."[39]

In the view of Greece, "re-entries into Earth's atmosphere of all United States Space Shuttles, which were successively flown above the national airspace of many third States, may be considered as precedents of a kind of innocent passage. Thus, due to the fact that no objection or opposition was raised by these States, it follows that an international customary law right was then created with respect to such passage, as it happened earlier in the case of the first artificial Earth satellite."[40]

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[37] *Id. at* 6-7.

[38] UN doc. A/AC.105/635/Add.2 of 18 March 1996, at 4. In response to question 2 (Does the regime applicable to the flight of aerospace objects differ according to whether it is located in airspace or outer space?), Italy indicated that "...on the basis of present technical results, the so-called `aerospace object' is conceived as and destined to a unitary function, meant for activities in outer space. the operational circumstances of crossing the Earth's atmosphere does not affect the mission's singleness under a unified regime". In response to question 6 (Are the norms of international and international air law applicable to an aerospace object of one State while it is in the airspace of another State?), Italy responded that "keeping particularly in account the phase of re-entry into atmosphere and the relevant flights activities of the `aerospace object', while observing the unified character of the above mission which prevents a positive answer to question 6, it is advisable to examine such flight activity with respect to the existing rules of air navigation in order to solve possible interferences." *Id.* at 3-4.

[39] UN doc. A/AC.105/635/Add.3 of 1 December 1996, at 9.

[40] *Id.*

Republic of Kazakstan's response did not address the customary law issue and merely indicated that "yes, there are precedents for such passage involving space objects of the Russian Federation. Such passage was provided for under the Agreement between the Russian Federation and the Republic of Kazakstan of 28 March 1994 on the Main Principles and Conditions for Utilization of the Baikonur Launch Site."[41]

Syrian Arab Republic stated that "no specific international customary law exists, with respect to such passage of aerospace objects over foreign territories. No such precedents are traced with respect to Syria."[42]

Turkey responded that "there are a number of incidents where fragments of space objects have fallen onto 'unwelcomed' territories. However, to our knowledge there are no well defined international practices in such cases. Some regulations need to be established."[43]

"Legal and policy issues raised by the UN Questionnaire on Aerospace Objects" were discussed at the 90th Annual Meeting of the American Society of International Law (ASIL) on 30 March 1996. The International Space Law Interest Group of ASIL, consisting of Harry Almond, Jr., Edward R. Finch, Jr. and Paul G. Dembling, provided comments with regard to various issues raised in the Questionnaire, including passage through airspace. On this particular issue, as reported by Stephen Gorove, Chairman of ASIL Committee on International Space Law, "the participants appeared to agree that - as long as the object's primary function was to operate as a spacecraft - its safe passage to and from outer space has now attained the status of international customary law."[44]

VI. Analysis

In view of the above-cited definitions of international legal custom, it is necessary to determine whether the passage of aerospace (or space) objects through foreign airspace satisfies the requirements of generality, consistency, uniformity and *opinio juris* to qualify as international legal custom.

Since renewed interest in this particular problem has arisen in connection with the above UN Questionnaire, it appears pertinent to carry out this analysis on the basis of the relevant question posed in the questionnaire, *i.e.:* "Are there precedents with respect to the passage of aerospace objects after re-entry into the Earth's atmosphere and does

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41 *Id.*

42 *Id.*

43 *Id.*

44 S. Gorove, *Legal and Policy Issues Raised by the UN. Questionnaire on Aerospace Objects*, 24 J. SPACE L. 53 (1996).

international customary law exist with respect to such passage?". The formulation of the question contains a number of ambiguities which should be kept in mind while addressing the substance of the question.

First, Member States are requested to report on precedents with respect to the passage of aerospace objects. While there is no agreed definition of either the term "space object" or the term "aerospace object", there appears to be a general agreement that the latter does not yet exist and is only being developed by some countries. Space shuttle-type objects, which immediately come to mind in this context, are universally recognized to be space, not aerospace, objects, the recognition of which is supported by state practice during the many years of space-shuttle operations.[45] Therefore, no above-referred precedents can possibly exist because aerospace objects themselves are non-existent.

Second, the expression "the passage of aerospace objects after re-entry into the Earth's atmosphere" misses the point of the problem. Even if one was to assume, for the sake of argument, that the space shuttle is an aerospace object, the fact that during landing the United States shuttle craft traverses long distances in United States airspace, does not pose any international legal problem. The problem is not with the passage of such objects through airspace *per se*, but rather through foreign airspace.

One additional difficulty in attempting to respond to the above question is of course the absence of a universally agreed upon boundary between airspace and outer space: one cannot say with certainty at which altitude an object's flight should be legally considered as occurring in airspace, and not in outer space. There exists, however, a general recognition that orbiting Earth satellites do indeed fly in outer space, and, accordingly, the boundary between airspace and outer space cannot possibly be higher than the lowest perigee of an orbiting satellite, *i.e.*, around 100 kilometers above sea level.[46]

With the above clarifications in mind, it should be stated that, as far as aerospace objects are concerned, the answer to the above question is obvious: since such aerospace vehicles do not yet exist, their operation cannot possibly be characterized as customary. Accordingly, there are no international legal customary rules regulating the passage of such objects through the airspace of foreign States or, in fact, regulating any other aspects of aerospace object operation.

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[45] Suffice to say that all launches of space shuttle-type vehicles were registered in accordance with the Convention on Registration of Objects Launched into Outer Space of 14 January 1975 (The Registration Convention: 28 U.S.T. 695, T.I.A.S. 8480, 1023 U.N.T.S. 15, entered into force on 15 September 1976) which instrument is designed for registration of space objects.

[46] V.S. Vereshchetin, *Next Steps in International Space Law*, *in* PERSPECTIVES ON INTERNATIONAL LAW 471-72 (Nandasiri Jasentuliyana ed., Kluwer Law International 1995).

Of course already existing customary norms for activities in outer space and/or in airspace, if any, will be applicable to aerospace objects when they become operational and fly in outer space or in airspace, respectively. However, as will be shown below, rights of passage through foreign airspace are not among those norms.

As far as space objects are concerned, the case is more complex.

Indeed, three specific situations should be distinguished while examining the question of the passage of space objects through airspace.

First, artificial Earth satellites, after the end of their active life, regularly re-enter the dense layers of the atmosphere over foreign states and either burn up completely or fall down, usually in a disintegrated form, to the Earth's surface. The legality of such "passage" through foreign airspace has never been challenged as illegal by states, except, as far as this author is aware, on a single occasion - the "Cosmos 954" incident.[47] However, it appears that those cases of impact should not be qualified as "passage" referred to in the above questionnaire because the term "passage" implies a flight of an operational object, not a falling of space debris. The principal difference here is that the falling of satellites or their component parts cannot be controlled or prevented by the launching State, while the flight of an operational vehicle is of course something which can be controlled or prevented, as the case may be.

The second situation concerns space objects which pass through foreign airspace unintentionally as a result of accident, error, malfunction, etc. For such situations, existing outer space agreements contain provisions implying the right of passage of both piloted and unmanned space objects through foreign airspace.[48] The 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the Rescue Agreement)[49] provides that the personnel of a spacecraft, which has landed in a foreign territory due to accident, distress, emergency or unintended landing, must be safely and promptly returned to the launching authority. Article 5 of the Rescue Agreement regulates questions of the return of unmanned space objects returned to Earth in a foreign territory, to the launching authority. The 1972 Convention on the International Liability for Damage Caused by Space

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[47] The only exception known to this author is "Cosmos 954" incident: *see* A.D. Terekhov, *Passage of space objects through foreign airspace*, 32 PROC. 51 (1990).; *see also* A.D. Terekhov, *International Liability for Damage Caused by Space Objects with Nuclear Power Sources on Board*, 35 PROC. 151-62 (1993).

[48] *See* A.D. Terekhov, *Passage of space objects through foreign airspace*, 32 PROC.50-55 (1990).

[49] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, 22 April 1968, 19 U.S.T. 7570, T.I.A.S. 6599, 672 U.N.T.S. 119 (entered into force 3 December 1968).

Objects (the Liability Convention)[50] provides for compensation for such damage on the surface of Earth and to aircraft in flight, but does not consider the passage *per se* of a space object through foreign airspace as illegal. The implicit right to pass through foreign airspace may also be found in the provisions of the Registration Convention dealing with the question of identifying space objects that have landed in foreign territory.

The third situation involves intentional flights of fully operational space objects through foreign airspace. As mentioned above, not much information is available concerning intentional pre-planned flights of operational space objects through foreign airspace. The United States which currently has the only functional space transportation system capable of such flights, the Space Shuttle, has not responded to the UN Questionnaire so far. At the same time it is noteworthy that in describing a specific case of one such flight over its territory, the Russian Federation indicated that "information received [by the USSR from the US]... was transmitted as a courtesy. An agreement was reached establishing that the fact that this information was furnished should not be deemed to set a precedent".[51] There is no doubt that "courtesy" in this context did not and could not mean an international legal obligation. Moreover, the two states even explicitly agreed that the provision of the above information did not set "a precedent" - a *conditio sine qua non* for an emerging custom if it is indeed evolving, as claimed by some.

The fact that such a wide variety of differing views with regard to the existence, or the absence of a customary rule of law for the passage of space objects through foreign airspace is being expressed, both by sovereign states and in legal doctrine, is by itself the best evidence that no such custom has so far developed. Presumably, this is true because international custom is based on a constant and uniform practice recognized in international law as having a legally binding character. Currently there is no proof of such state practice or of the recognition in international law, of the legally-binding right of passage.

It appears that there may be a certain degree of misunderstanding on the part of those scholars who believe that a right of passage or transit of space objects through foreign airspace has become or is becoming a customary rule of international law. This misunderstanding perhaps originates from the fact that since the beginning of the space era there have been no protests against defunct satellites entering the upper layers of the atmosphere over foreign states after the end of their active life, and either burning up completely or even having some of the debris reaching the surface.

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[50] Convention on International Liability for Damage Caused by Space Objects, 29 March 1972, 24 U.S.T. 2398, T.I.A.S. 7762, 961 U.N.T.S. 187 (entered into force 1 September 1972).

[51] *Supra* note 14, at 5.

Indeed those numerous occurrences are treated by States as acceptable. However, this fact does not mean that a new customary norm of international law has developed or is emerging for the following two reasons.

First, as indicated above, the existing outer space agreements obviously imply the right of a space object to fall down on a foreign territory. The Outer Space Treaty, the Rescue Agreement, the Liability Convention and the Registration Convention contain specific provisions obligating a State on whose territory such objects or their component part have been discovered, to take specific actions. While those actions may be different depending on the circumstances of each particular incident, the fact itself that an object or its part has fallen down on foreign soil is not considered in those agreements as a violation of international law. Thus the "right to fall down" for space objects should be viewed as a conventional right and not as a customary norm.

Second, there is a big difference between defunct satellites or malfunctioning manned craft landing helplessly in foreign countries, and fully operational vehicles making a pre-planned intentional passage through foreign airspace. There is little doubt that, hypothetically, had such a passage taken place today "on the basis of a customary norm of international law", the state concerned would disagree that it is obliged to accept such a flight in its airspace because allegedly there is such a custom.

Finally, there is one more consideration which should be kept in mind while examining the issue of passage through foreign airspace. All such passages (for the most part, not actually passages but rather falling down) occurred in the direction from outer space to the surface of Earth. Even if one was to admit, for the sake of argument, that some kind of a custom has indeed evolved with regard to passage of space objects through foreign airspace, such a "customary norm" would be rather one-sided, *i.e.*, it would apply only to flights from outer space to Earth, but not *vice versa*.

Vereshchetin observed that:

> There are reasons to suggest that the future utilization of aerospace planes of different configurations would not diminish but would, instead, increase the concerns of States over their national security, commercial interests, safety of air traffic, environmental protection, etc. Hence, the issue of a formal treaty, to distinguish airspace from outer space will not lose its significance with advent of aerospace planes. Conversely, the significance of this issue could increase because the transit of aerospace planes through foreign airspace would become a frequent occurrence.[52]

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[52] *Supra* note 40, at 471.

Currently, however, the level of sophistication of space transportation systems is such that they are not capable of making meaningful flights through airspace. Moreover, in order for the only existing vehicle of this type, the US Space Shuttle, to fulfill its mission, such flights through foreign airspace are hardly necessary. It is not surprising, therefore, that there are very few cases of such passage. In view of the above arguments, it is too early to speak about the emergence of a general, consistent and uniform state practice in this field of international relations, as well as of *opinio juris*, leading to the establishment of a new rule of customary international law - the right of passage of space objects through foreign airspace.

VII. Conclusions

On the basis of the foregoing, the following conclusions may be formulated:

- There are no international legal customary rules regulating the passage of aerospace objects through foreign airspace due to the fact alone that no aerospace objects have been developed so far: if something has never been used, there can be no custom for using it.

- The re-entry of artificial Earth satellites, after the end of their active life, into the dense layers of atmosphere over foreign states and/or the falling down of such satellites, usually in a disintegrated form and naturally through airspace, onto the surface of Earth, is legal. The existing outer space agreements imply the right of a space object to fall down on a foreign territory.

- The existing outer space agreements contain provisions implying the right of passage of both piloted and unmanned space objects through foreign airspace as a result of accident, error, malfunction, etc.

- The very limited number of cases of flights of operational space objects through foreign airspace makes it premature to state that a customary legal norm has developed whereby a state has a right to carry out such flights without the consent of the underlying state.

- The absence of such a customary norm of international law is confirmed by the opposing views on the subject expressed both by states and in legal doctrine.

THE USE OF NUCLEAR POWER SOURCES IN OUTER SPACE AND ITS EFFECT ON ENVIRONMENTAL PROTECTION

R. I. R. Abeyratne*

Introduction

The COSMOS 954 incident of January 1978 -- where a Soviet satellite disintegrated over Northern Canada -- brought to bear the relevance of environmental protection as a corollary to the exploration of outer space. The accident scattered debris over 600 kilometres of Canadian territory, most of which was found to be radioactive. Two subsequent incidents -- the first relating to the re-entry of COSMOS 1402 into the Earth's atmosphere in early 1983 and the second relating to COSMOS 1960 in 1988 -- endorsed the concern of the world community on environmental issues which are related to the exploration of outer space.[1] These incidents also underscored the fact that the primary pollutant in activities related to nuclear power sources in outer space is radioactivity caused by nuclear waste which is released both in outer space and in the environment.

The limited *Nuclear Test Ban Treaty*[2] which is the seminal document that provides for environmental protection against radioactivity caused by nuclear waste, provides in its Article 1 that States Parties to the Treaty undertake to prohibit, to prevent and not carry out any nuclear weapon test explosion, or any other nuclear explosion, at any place under its jurisdiction or control or *inter alia* in outer space or in any other environment if such explosion causes radioactive debris to be present outside the territorial limits of the State under whose jurisdiction or control such explosion is conducted.[3] The Treaty further provides that no State Party may collaborate with or encourage such activity.[4]

The *Outer Space Treaty*,[5] while expostulating the fundamental principle in its Article 1 that the exploration and use of outer space,

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1 For a detailed discussion of these incidents, *see* INTERNATIONAL SPACE LAW IN THE MAKING, FORUM FOR AIR AND SPACE LAW 19-22 (Marietta Benkö & Kai-Uwe Schrogl eds., Editions Frontières 1993).

2 Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Over Water, Aug. 5, 1963, 480 U.N.T.S. 45, 45.

3 *Id.* Art. 1(a) and (b).

4 *Id.* Art. 2.

5 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, *opened for signature* Jan. 27 1967, 610 U.N.T.S. 205 (hereinafter "Outer Space Treaty").

including the moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, explicitly imposes in Article VII international liability and responsibility on each State Party to the Treaty, for damage caused to another State Party or to its populace (whether natural or juridical) by the launch or procurement of launch of an object into outer space. In its preceding provisions the Treaty imposes international responsibility on States Parties for national activities conducted in outer space. The Treaty also requires its States Parties to be guided by the principle of co-operation and mutual assistance in the conduct of all their activities in outer space.[6] This overall principle is further elucidated in the same provision: "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 harmful contamination and also adverse changes in the environment of the Earth resulting from the introduction of extra terrestrial matter."[7]

The *Moon Agreement*[8] of 1979 provides that in the exploration and use of the moon, States Parties shall take measures *inter alia* to avoid harmfully affecting the environment of the earth through the introduction of extra terrestrial matter or otherwise.[9]

The United Nations Conference on the Human Environment, held in Stockholm in June 1972,[10] while recognizing that States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies,[11] require States to co-operate in the further development of international law regarding liability and compensation for the victims of pollution and other environmental damage caused by activities within the jurisdiction or control of States to areas beyond their jurisdiction.

Liability and Responsibility of States

The *Liability Convention* [12] contains a provision which lays down the legal remedy in instances of damage caused by Space objects. Article II provides: "A launching State shall be absolutely liable to pay compensation for damage caused by its space objects on the surface of the Earth or to

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6 *Id*. Art. IX

7 *Id*.

8 Agreement Governing the Activities of States on the Moon and other Celestial Bodies, Dec. 5 1979, U.N. Doc. A/RES/34/68 (1979).

9 *Id*. Art. 7.

10 For text of the United Nations Conference on the Human Environment, adopted June 16, 1972, see U.N. Doc. A/CONF.48/14 and Corr. 1, *reported in* 11 I.L.M. 1416.

11 *Id*. Principle 21.

12 Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 24 U.S.T. 2389, T.I.A.S. No. 7762.

aircraft in flight,"[13] thereby imposing a regime of absolute liability on the State that launches space objects such as satellites, which provide technology and communication that is used for air navigational purposes. Although admittedly, both the *Outer Space Treaty* and the *Liability Convention* do not explicitly provide for damage caused by technology and communication provided by space objects, culpability arising from the "common interest" principle and liability provisions of the two conventions can be imputed to States under these Conventions.

Gorove states that in the field of international space law, two clearly connected terms have been used: liability and responsibility.[14] Although "responsibility" has not been cohesively interpreted in any legal treaty relating to outer space, "liability" occurs in the *Liability Convention* and is sufficiently clear therein. This, however, does not mean that State responsibility is not relevant to the obligations of States' law as, in international relations, the invasion of a right or other legal interest of one subject of the law by another inevitably creates legal responsibility. Professor Brownlie observes:

> [T]oday, one can regard responsibility as a general principle of international law, a concomitant of substantive rules and of the supposition that acts and omissions may be categorized as illegal by reference to the rules establishing rights and duties. Shortly, the law of responsibility is concerned with the incidence and consequence of illegal acts, and particularly the payment of compensation for loss caused.[15]

International responsibility relates both to breaches of treaty provisions and other breaches of legal duty. In the *Spanish Zone of Morocco Claims* case, Justice Huber observed: Responsibility is the necessary corollary of a right. All rights of an international character involve international responsibility. If the obligation in question is not met, responsibility entails the duty to make reparation.[16]

There is also explicit recognition that principles of international law apply to space law. The General Assembly of the United Nations in 1961 adopted the view that international law, including the Charter of the United Nations, applies to outer space and celestial bodies.[17] It is also now

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[13] Article II(a) defines damage as including loss of life, personal injury or other impairment of health; or loss or damage to property of States or of persons natural or juridical, or property of international governmental organizations.

[14] Stephen Gorove, *Liability in Space Law: An Overview*, 8 ANNALS AIR & SPACE L. 373 (1983).

[15] IAN BROWNLE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 433 (4th ed., Clarendon Press 1990).

[16] *1925 RIAA ii* 615, 641.

[17] Resolution 1721 (XVI), *adopted* Dec. 20, 1961. *See also* Art. III of the Outer Space

recognized as a principle of international law that the breach of a duty involves an obligation to make reparation appropriately and adequately. This reparation is regarded as the indispensable complement of a failure to apply a convention and is applied as an inarticulate premise that need not be stated in the breached convention itself.[18] The ICJ affirmed this principle in 1949 in the *Corfu Channel* case[19] by holding that Albania was responsible under international law to pay compensation to the United Kingdom for not warning that Albania had laid mines in Albanian waters which caused explosions, damaging ships belonging to the United Kingdom. Since the treaty law provisions of liability and the general principles of international law as discussed complement each other in endorsing the liability of States to compensate for damage caused by space objects, there is no contention as to whether in the use of nuclear power sources in outer space, damage caused by the uses of space objects or use thereof would not go uncompensated. The rationale for the award of compensation is explicitly included in Article XII of the *Liability Convention* which requires that the person aggrieved or injured should be restored (by the award of compensation to him) to the condition in which he would have been if the damage had not occurred. Furthermore, under the principles of international law, moral damages based on pain, suffering and humiliation, as well as on other considerations, are considered recoverable.[20]

As discussed, both treaty law and general principles of international law on the subject of space law make the two elements of liability and responsibility a means to an end - that of awarding compensation to an aggrieved State or other subject under the law. Therefore, in view of the many legal issues that may arise, the primary purpose of a regulatory body which sets standards on State liability in issues concerning the use of space technology would be to carefully consider the subtleties of responsibility and liability and explore their consequences on States and others involved as they apply to the overall concept of the status of a State as a user of space technology which may cause harm or injury to the latter.

The basic principle of space law is the "common interest" principle which emerged as a result of the first specific Resolution on space law of the United Nations General Assembly in 1958.[21] The "common interest" principle has since been incorporated in subsequent multilateral treaties, particularly the *Outer Space Treaty* of 1967,[22] Article 1(1) of which provides: "The exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind." This provision,

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Treaty, *supra* note 5.

18 In Re Chorzow Factory (Jurisdiction) Case, 1927 P.C.I.J. (Ser. A) No. 9, at 21.

19 1949 I.C.J. 4, at 23.

20 CARL Q. CHRISTOL, SPACE LAW PAST, PRESENT AND FUTURE 231 (Kluwer 1991).

21 G.A. Res. 1348 (XII) (1958).

22 *Supra* note 5.

which binds signatory States, is seemingly a departure from the traditional "national interest" approach of international law and has represented a moral obligation to some,[23] while to others the provision has represented a *jus cogens* or mandatory legal principle.[24]

The International Court of Justice (ICJ), in the *North Sea Continental Shelf* case,[25] held that legal principles that are incorporated in Treaties, such as the "common interest" principle, become customary international law by virtue of Article 38 of the 1969 Vienna Convention on the Law of Treaties. Article 38 recognizes that a rule set forth in a treaty would become binding upon a third State as a customary rule of international law if it is generally recognized by the States concerned as such. Article 1(1) of the *Outer Space Treaty*, which designates that the use of space technology is achieved under the "common interest" principle for the common good of humanity, therefore becomes a principle of customary international law, or *jus cogens*. Obligations arising from *jus cogens* are considered applicable *erga omnes* which would mean that States using space technology owe a duty of care to the world at large in the provision of such technology. The ICJ in the *Barcelona Traction Case* held:

> [A]n essential distinction should be drawn between the obligations of a State towards the international community as a whole, and those arising *vis a vis* another State in the field of diplomatic protection. By their very nature, the former are the concerns of all States. In view of the importance of the rights involved, all States can be held to have a legal interest in their protection; they are obligations *erga omnes*.[26]

The International Law Commission has observed of the ICJ decision: "In the Courts view, there are in fact a number, albeit limited, of international obligations which, by reason of their importance to the international community as a whole, are - unlike others - obligations in respect of which all States have legal interest."[27]

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[23] D. Goedhuis, *Some Substantive and Procedural Issues Presently at Stake in Space Legislation*, 25 ZEITSCHRIFT F. LUFT- & WELTRAUMRECHT (GERMAN J. AIR & SPACE L.) 195, 198-199 (1976); Bin Cheng, *The 1967 Space Treaty*, 95 J. DROIT INT'L 532, 578 (1968).

[24] M.G. Markoff, *Disarmament and 'Peaceful Purposes' Provisions in the 1967 Outer Space Treaty*, 4 J. SPACE L. 3 (1976). *See also* N.M. Matte, *Aerospace Law: Telecommunications Satellites*, 166 R.C.A.D.I. 119, 147 (1980); R.S. JAKHU, DEVELOPING COUNTRIES AND THE FUNDAMENTAL PRINCIPLES OF INTERNATIONAL SPACE LAW 351 (Girardot *et al.* eds.); C.Q. Christol, *The Jus Cogens Principle and International Space Law*, 26 PROC. COLLOQ. L. OUTER SPACE 1 (1983).

[25] 1970 I.C.J. 32.

[26] Barcelona Traction, Light and Power Company Limited, 1974 I.C.J. 253, 269-270.

[27] 2 Y.B. Int'l L. Comm'n 29 (Pt. 1, 1976).

The views of the ICJ and the International Law Commission, which has supported the approach taken by the ICJ, give rise to two possible conclusions relating to *jus cogens* and its resultant obligations *erga omnes*:

a) obligations *erga omnes* affect all States and thus cannot be made inapplicable to a State or group of States by an exclusive clause in a treaty or other document reflecting legal obligations without the consent of the international community as a whole;

b) obligations *erga omnes* preempt other obligations which may be incompatible with them.

Some examples of obligations *erga omnes* cited by the ICJ are prohibition of acts of aggression, genocide, slavery and discrimination.[28] It is indeed worthy of note that all these obligations are derivatives of norms which are *jus cogens* at international law.

If it can be accepted that a principle of *jus cogens* creates obligations *erga omnes*, it becomes an undeniable fact that Article 1(1) of the *Outer Space Treaty* could be considered a peremptory norm or *jus cogens,* since it generates obligations towards the international community as a whole. Christol observes:

> Article 1 Paragraph 1 of the Space Treaty, with its adoption of the common benefits and interests guarantee, can be supported (as an example of peremptory norms) because the provisions conform to moral law in the sense that all humankind is to benefit unconditionally, and because the terms are consistent with the spirit and the purposes identified in Article 1 Pars. 1 through 3 and Article 2 pars. 1 through 4 of the UN Charter, as well as with complimentary international agreements of lesser authority. To the extent that the terms are beneficial to individuals, the larger community, and States, and when the provisions are found on the fundamental moral principles contained in the foregoing paragraphs of Article 1 and 2 of the UN Charter, such basic principles qualify for the status of peremptory norms of general international law.[29]

The effect of this observation is that the content and nature of Article 1 (1) confirms that it is a *jus cogens.* There is seemingly no reason why the international community should not give such recognition to the "common interest" principle as enshrined in Article 1(1) which is aimed at the protection of the interests of the international community as a whole. *A fortiori*, on the same basis, Article IX of the *Outer Space Treaty* which

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[28] 1970 I.C.J. 32.

[29] Christol, *op. cit., supra* note 20, at 6.

requires that States should avoid harmful contamination and adverse change in the environment of the Earth which may result from the exploration of outer space would incontrovertibly be considered *jus cogens*.

Article VI of the *Outer Space Treaty* provides in part that State Parties to the Treaty shall bear international responsibility for national activities in outer space, whether such activities are carried out by governmental agencies or non-governmental agencies. This provision clearly introduces the notion of strict liability *erga omnes* to the application of the *jus cogens* principle relating to outer space activities of States and could be considered applicable in instances where States hold out to the international community as providers of technology achieved and used by them in outer space, which is used for purposes of air navigation. Article VI further requires that the activities of non-governmental entities in outer space shall require authorization and continuing supervision by the appropriate State Party to the Treaty, thus ensuring that the State whose nationality the entity bears would be vicariously answerable for the activities of that organization, thereby imputing liability to the State concerned.

Article VII makes a State Party internationally liable to another State Party for damage caused by a space object launched by that State.

The *Registration Convention* of 1974[30] in Article II(1) requires a launching State of a space object that is launched into earth orbit or beyond, to register such space object by means of an entry in an appropriate registry which it shall maintains and inform the Secretary General of the United Nations of the establishment of such a registry. This provision ensures that the international community is kept aware of which State is responsible for which space object and enables the United Nations to observe outer space activities of States. Article VI of the Convention makes it an obligation of all State Parties, including those that possess space monitoring and tracking facilities, to render assistance in identifying a space object which causes damage to other space objects or persons. Justice Manfred Lachs analyzes these provisions of the *Registration Convention* to mean that the State of registry and the location of the space object would govern jurisdictional issues arising out of the legal status of space objects.[31] On the issue of joint launching of space objects, Justice Lachs observes:

> No difficulties arise whenever a State launches its own object from its own territory; the same applies to objects owned or launched by non-governmental agencies registered in that State. However, in cases of joint launching, agreement between the parties is required as to which of them is to be deemed the "State of Registry". A similar agreement is also

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[30] Convention on Registration of Objects Launched into Outer Space, *adopted by* U.N.G.A. Nov. 12, 1974, 1023 U.N.T.S. 15.

[31] MANFRED LACHS, THE LAW OF OUTER SPACE, AN EXPERIENCE IN CONTEMPORARY LAW MAKING 70 (Sijthoff Leiden 1972).

> necessary when a launching is carried out by an international organization.[32]

The above provision ensures the identification of parties responsible for specific activities in outer space and thereby makes it easier to impose liability for environmental damage caused.

Application of International Environmental Law to Outer Space Exploration

Justice Manfred Lachs was of the view:

> If all the activities connected with outer space are to be conducted for the benefit of all and to the detriment of none, international co-operation is essential, and if all the possibilities opened up are to be used in a responsible manner, the conduct of States in regard to outer space must be submitted to the rule of law.[33]

Although Judge Lachs' observation was indubitably meant to convey the need for global co-operation in issues of outer space exploration in the broadest possible sense, it is relevant in the present context that this visionary statement could be segmented to apply to corollaries of outer space activities as well, such as the environmental impact of nuclear power sources in outer space. In a determination of this narrow area, the emergence of environmental law as a necessary adjunct to the burgeoning world order of today becomes a compelling issue.

It is indeed inevitable that advances in space technology and co-operation in outer space exploration would raise issues requiring the environmental impact of these developments. At the same time, it is fortunate that an international order governing environmental protection has emerged to offer solutions to the problems that may arise from those activities. The effectiveness of international environmental law as it applies to outer space exploration therefore becomes the pivotal consideration.

The application of environmental law to outer space activities lies in the fundamental postulate that outer space is free for exploration and use by all States without discrimination of any kind and on a basis of equality.[34] This principle lays down the freedom of action for all States on the basis of the prohibition of discrimination; the recognition of equality of all States; and the requirement that the activities be conducted in accordance with international law.[35] The last element - accordance with international law - derives its validity from the 1963 *Declaration of Legal Principles Governing*

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[32] *Id.*

[33] Manfred Lachs, *op. cit., supra* note 31, at 6-7.

[34] *See* Moon Treaty, *supra* note 8, art. 1, para. 2.

[35] Manfred Lachs, *supra* note 31, at 44-45.

the Activities of States in the Exploration and Use of Outer Space wherein States parties declared in unequivocal terms that their governments would respect the principles of the Declaration,[36] which essentially established the general principle of international co-operation and adherence to customary international law in outer space exploration. This leaves no room for doubt that international environmental law, like the space treaties discussed above, would be inextricably applicable to space law.

In December 1992, the United Nations General Assembly adopted Resolution 47/68[37] which provides that activities involving the use of nuclear power sources in outer space shall be carried out in accordance with international law including in principle the charter of the United Nations and the *Outer Space Treaty*. The treaty also provides that, in order to minimize the quantity of radioactive material in space and the risks involved, the use of nuclear power sources in outer space shall be restricted to those space space missions which cannot be operated by non nuclear sources in a reasonable way. Among the more notable provisions of the treaty are those providing for assistance to States, whereby all States possessing space monitoring and tracking facilities to communicate to the Secretary General of the United Nations and the States concerned information of space objects with a nuclear power source entering the atmosphere; international responsibility of States for national activities in outer space involving nuclear power sources and liability and compensation.

The cornerstone of international environmental law is the Rio Declaration[38] which is a statement of basic principles emanating from the United Nations Conference on Environmental Development held in Rio de Janeiro in June 1992. The Rio Declaration endorses and updates Principle 21 of the Stockholm Declaration, which provides a delicate but harmonious balance of recognizing the inalienable rights of all States to exploit their own resources pursuant to their own environmental and developmental policies while at the same time recognizing their responsibility to ensure that activities within their jurisdiction and control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction[39].

The Rio Declaration explicitly places common but differentiated responsibilities on States on the subject of environmental protection by exhorting developed countries to be internationally responsible in their international pursuit of sustainable development in view of the pressures their societies place on the global environment and of the technologies and

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[36] *Id.* at 138.

[37] U.N.G.A. Res. 47/68, *Principles Relevant to the Use of Nuclear Power Sources in Outer Space*, UN Press Release GA/8470 148 (1993). *See also* Marietta Benkö & Kai-Uwe Schrogl, *supra* note 1, at 98-110.

[38] 21 I.L.M. 876 (1992). *See also* UNITED NATIONS, THE GLOBAL PARTNERSHIP FOR ENVIRONMENT AND DEVELOPMENT: A GUIDE TO AGENDA 21, at 1-4 (1992).

[39] Principle 2 of the Rio Declaration, *reprinted in* 21 I. L. M. 876 (1992).

financial resources they command.[40] The Rio Declaration also calls for the application of the "polluter pays" principle,[41] and *inter alia*, obliges States to undertake environmental impact assessment.[42]

Nanda observes:

> International environmental law has become probably the most vigorously evolving chapter in international law, in the form of global, regional and bilateral treaties; in the form of rapidly developing customary law; in the form of supernational directives (in the EU); and even more, in the form of various types of soft law.[43]

Therefore, as outer space exploration evolves with its characteristic rapidity, the need for international law to address specific issues becomes compelling. Environmental protection is one such issue, which requires urgent and short-term attention.

Conclusion

It has been said that three of the most important space law issues that the international community will have to deal with relate to manned space flights, future aerospace planes and the protection of the space environment.[44] Of these, space environment is arguably the most contentious, at least if one were to judge from the proliferation of legal material that has emanated from the scholars on the subject of contamination of the environment by by-products of space exploration.

The central treaty provision which refers to space environment is Article IX of the *Outer Space Treaty* which entreats States to avoid harmful contamination ot the environment of the Earth and also to ensure that there are no adverse changes in the environment as a result of their activities in outer space. As a stand-alone provision Article IX is impotent, in that it fails to definitively set standards or in the least leave room for a regulatory body to set standards in the field of space environment. For instance, Article IX provides that States shall where necessary, adopt measures for the above purpose. One has to go a bit further than this blanket statement if one were to ensure global cooperation in matters of space environment. As Jasentuliyana draws the analogy of the Annexes to the Chicago Convention in the field of regulation by ICAO in matters related to civil aviation:

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40 Rio Declaration, *Id.* Principle 7, at 877.

41 *Id.* Principle 16.

42 *Id.* Principle 17.

43 V. Nanda, *International Environmental Law and Policy, in* PERSPECTIVES IN INTERNATIONAL LAW 101 (N. Jasentuliyana ed., Kluwer 1995).

44 V.S. VERESHCHETIN, *Next Steps in International Space Law, in id.* at 463, 477.

> the technical Annexes to the Chicago Convention are one reason why ICAO has been so successful in international law making. Through the use of these Annexes, the Organization has been able to separate the political and technical facets of international civil aviation. To a large degree, uniformity in all technical and navigational aspects of international civil aviation has been achieved.[45]

Jasentuliyana takes his statement a step further when he recommends that the United Nations might develop a treaty with broad and general guidance for this purpose, leaving it to an international technical body to establish standards and recommended practices for States to follow.[46] This is a sound recommendation, not only because the commentator has chosen the closely related field of aviation as an analogy but also because the Annexes to the Chicago Convention have demonstrated their efficacy over the years as instruments of regulation. it must be noted that within the United Nations Law making system, not only the adoption of a treaty, but also its subsequent development has been proved to be important. Of course, such a project should be embarked upon after a carefully thought out assessment of the likelihood of success of such a treaty which will depend on the following:

1) the technical difficulty of the project and resolution of the scientific, technical, economic and other problems that may accompany the project;

2) the acceptability of the treaty to the organizations of States Parties and its effectiveness in implementation of its provision.

Although several specialized agencies of the United Nations system have procedures that modify, without eliminating, the positivist principle that States are normally bound only by international rules to which they have consented,[47] ICAO provides the best example of treaty development. The Chicago Convention authorizes the ICAO Council to adopt international standards and recommended practices (SARPS) as Annexes to the Convention. These SARPs have bestowed on the ICAO Council at least a quasi-legislative function and are highly authoritative in practice. They ensure safety and efficiency in air travel and are used widely by States, particularly in the context of Annex 2, which provides for Rules of the Air.

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[45] Nandasiri Jasentuliyana, *Celebrating Fifty Years of the Chicago Convention Twenty-Five Years after the Moon Landing: Lessons for Space Law*, 19 ANNALS AIR & SPACE L. 429, 444 (Pt. II, 1994).

[46] Nandasiri Jasentuliyana, *A Survey of Space Law as Developed by the United Nations*, *in* PERSPECTIVES ON INTERNATIONAL LAW 349, *supra* note 43, at 378.

[47] For details of regulation by United Nations specialized agencies, see Frederic L. Kirgis, *Specialized Law Making Processes*, *in* 1 UNITED NATIONS LEGAL ORDER 121-135 (O. Schachter & C.C. Joyner eds., Cambridge Univ. Press).

Therefore, although the analogy of the Annexes to the Chicago Convention is not necessarily a panacea to the perceived lacuna in the field of regulation of environmental protection in outer space exploration, it may well be a suitable starting point.

EVENTS OF INTEREST

A. PAST EVENTS

REPORTS

Practitioners' Forum

The European Centre for Space Law (ECSL) held its Fifth Practitioners' Forum Monday October 28, 1996 at the European Space Agency (ESA) Headquarters in Paris. This forum, opened by the Chairman of the morning session, Professor *K.H. Böckstiegel*, was dedicated to the new developments of space law, during the morning session, and to the problem of the data policy and pricing, in the afternoon session.

Ms. Sylvia Ospina, Consultant of Satellite Telecommunications Policies, focused on the major legal and technological changes in the satellite sector over the past year and the impact of these changes on European Union (EU) policies in satellite telecommunications. Regarding policy making, in September 1996, the European Council reached an agreement on a revised "Proposal for a European Parliament and Council Decision on an action in the field of Satellite Personal Communication Services (S-PCS) in the European Union." This measure is important in relation to a harmonized EU approach to prevent the "fragmentation" of assignments among European countries. In addition, an integrated European position is necessary to counterbalance the strong American FCC influence in the satellite industry, which introduced the first Domestic and International Satellite Consolidation Order (DISCO I) policy in January 1996. The adoption of this policy gives the United States (US) a global advantage in the provision of various types of telecommunications. During the WTO/GBT negotiations, the United States decided to exclude the satellite industry from the bargaining table, alleging that a sufficient number of nations must make increased and more profitable offers to the US before reopening the issue of satellite communications at the WTO. Following the WTO/GBT negotiations, in May 1996 the FCC proposed DISCO II, a policy which would impose a two part test on non US licensed satellite systems providing services in the US which all domestic and international systems would have to fulfill before obtaining licenses for earth stations. On October 10, 1996 a High Level Meeting on Satellite Communications was held in Paris to discuss the importance of satellite communications, to create an action plan with the goal of assuring cooperation among EU member states and reinforce its position at various international fora such as the WTO. One major issue is the potential FCC transformation into an international regulator as a result of the DISCO II policy, influencing international communications which should be in the domain of the ITU. The EU must prepare a response, and the Commission is seeking to increase cooperation in the area of frequencies and spectrum with CEPT (European

Conference of Posts and Telecommunications) member countries and particularly with CEPT countries which are not EU members.

Jacques Masson of Willis Corroon and *Mr. Bruno Ritchie* of AGF presented the role of insurance and liability in the satellite industry. Mr. Masson began by stating that 20% of space program budgets are diverted towards insurance. He emphasized that, due to the very high investment projects, it is necessary to settle all claims as quickly as possible. Factors affecting rates include the type of satellite and launcher, the market capacity which now stands at US$5-600 million, and the competitive rates. Mr. Ritchie spoke of the satellite orbit. The 45 new GEO satellites insured this year and the potential 40 launch operations to be undertaken by the end of 1996 illustrates the growth of the space insurance market.

Marco Ferrazzani of the ESA presented the discourse of *Mr. Michael Paillon* of EU Commission DG-XII, on EU developments in earth observation (E.O.) strategy. The European Commission proposed a research, technology and development initiative for 1995 through 1998 with an objective to create the necessary conditions for the growth of sustainable demand and to prime the European market for E.O. products and services for research and operational purposes. Another initiative of the European Union has given rise to the Center for Earth Observation (CEO), a draft project aimed at encouraging better communication between individual users and among user communities, at stimulating the creation of high level products, at promoting improved data standardization and quality assurance, at coordinating the design and operation of future decentralized data archives, data bases as well as data delivery services, and at improving the visibility of E.O. data, services and expertise. It is too early to assess the results of such an initiative, but it is hoped that through the decentralized and cost sharing nature of the project, it will be beneficial to the participating member states and international organizations.

Harry Tuinder of HT&W Consultants presented the Database Directive of the European Union adopted on March 11, 1996. The main problem cited by Mr. Tuinder is the possible lack of cohesion between the Directive and E.O. data, as the Directive does not address the peculiarities of E.O. data. Secondly, the defined scope of application, included in Article 1 of the Directive, leaves unanswered the question of qualification of a collection of E.O. data as a database. Finally, Article 7 addresses the *sui generis* right, which is fundamental to E.O. data because it protects the content of the database while prohibiting unauthorized extraction.

In the afternoon, the floor was opened to a panel discussion introduced by *Gérard Brachet* of CNES (Centre National d'Etudes Spatiales), who described the current status of commercial or at cost pricing before turning the discussion to the panelists. *Dr. Volker Thiem* of EUMETSAT resumed the EUMETSAT data policy. The satellite system offers to its members and to a wide global community high quality satellite data with a non-discrimination policy regarding users. The EUMETSAT policy is driven by a philosophy of "service," meaning it grants free access to scientific users while certain special data used by non-members of

EUMETSAT necessitates a fee: customers should profit from both legal accessibility and optimum service.

Mr. Hopkins of ESA spoke of the free data policy versus the commercial data policy regarding the use of E.O. data. ESA's current data policy, proposed by ERS member states, is a hybrid of the two approaches identifying 5 categories of users: internal users, special researchers, meteorological organizations, public utilities and commercial customers. A task force which is currently considering the Data Policy for Envisat will make available their results by the end of this year. This policy is intended to investigate the extent to which any innovative measures can be implemented in the ERS scenario.

Luc Dufresne of SPOT-Image discussed the role of a commercial system adapting to the current market. The SPOT system has a policy of non-discrimination, meaning universal prices for services used, applied to all users. Finally, *Dr. Ing. Colette Girard* of the Institut National Agronomique Paris-Grignon expressed the position of researchers working with E.O. data. Because of the utility of E.O. data, it must be available to students, researchers and commercial users alike free of charge. The data itself should be accompanied by a methodology for proper use, while there should not be a price distinction between new and old data because old data are necessary to understand and exploit the new data. The issue at hand is the quality of information rather that the pricing structure, and it is hoped that the European Union CEO project will lend some "transparence" to the problem of information.

Amine Laachani
Ranjani Srinivasan
Université Jean Monnet - Paris XI

International Space Law at Punta del Este

At the Third Space Conference of the Americas held at Punta del Este, Uruguay, part of the plenary session on November 6, 1997, was devoted to a discussion of international space law. In his introduction *Dr. Eduardo D. Gaggero* (Uruguay), moderator of the session, recalled the fact that in the previous conferences the juridical area was dealt with in one of the working commissions. In this conference, it was decided not to establish a specific commission because it was considered that technological issues are closely linked to the law. In fact, the law is a guarantee, a support of space activities, so the legal aspects must be treated in all commissions. Finally, he stated that the Space Conferences of the Americas are useful for space development and regional cooperation; they constitute a mechanism that must be adjusted and transformed in light of past experiences.

Dr. Nandasiri Jasentuliyana (United Nations) made a presentation on "Space Law: the Newest Branch of International Law." He examined the historical development of space law and the invaluable contribution that the Third World, especially jurists from Latin-America, have made to the development of space law. Apart from other participants and contributions,

he mentioned the CHM concept, the Remote Sensing Principles, the GSO issue, and the Declaration of Legal Principles on Outer Space Benefits. He analyzed the creation of space law in different ambits, such as the specialized agencies of the UN system, regional and multilateral space organizations, NGOs, etc.

Concerning the future of space law, he stated that rapid changes in space technology have created many new legal, economic and technical problems that need to be solved (commercialization, privatization, deregulation, etc.). He also recalled the contributions of space law to international law, mentioning among others, the CHM concept, the procedural aspects of international law (consensus procedure) and the space law moot court competition.

Finally, Dr. Jasentuliyana stated that there is no doubt that space law is a distinct and mature discipline of international law, and it therefore deserves greater and more concentrated attention by law-makers at the national and international level and by educational institutions.

Another speaker, *Dr. Aldo A. Cocca* (Argentina) referred to the management of natural resources. He pointed out that the phrase "natural resources" has had a very particular kind of development in international law, where a ready-made phrase had to be created: "permanent sovereignty over natural resources." Problems arose when the natural resources concept was applied to the Moon and other celestial bodies.

He reminded Dr. Jasentuliyana in the sense that the dispositions of the Moon Agreement should be taken as a tool to protect space activities that will be carried out in the future. The Law of the Sea should serve as a model but in an improved form. He noted that during these years, we have not been able to arrive at an agreement on a regime for the management of natural resources. He recalled that Argentina in 1969 stated in the UN that there was a lack of regulation on principles governing space. There are a lot of questions that arise: would it be convenient to have a license from the UN for the extraction of space resources? What kind of property should be recognized in this lunar matter? What should be the legal position with respect to things taken from the Moon? Dr. Cocca concluded by stating that a regime must be established compensating those who have undergone the risk of discovering and exploiting the resource and such regime should be administered as part of the CHM with benefits for the world community. The issue is now posed for civilians rather than internationalists.

Dr. Manuel A. Ferrer (Argentina) proposed to "think together" about international cooperation. International cooperation is obligatory under the Outer Space Treaty (OST) and its stipulations, including the right of transit in outer space. There is an obligation to promote it and contribute to it. It is a principle of "*jus cogens*" approved by more of 100 countries. The question appeared in the COPUOS agenda and a draft Resolution was passed to the UNGA. The Resolution refers to international cooperation in a contractual sense and does not allude to the obligatory international cooperation established in the OST. International cooperation is not a gift. It is to operate jointly.

The international community is behind the effort to set up a regime to exploit the Moon's resources. The activity is not feasible now, but we have to establish a legal framework according to the existing regime (all states have agreed not to exercise rights of sovereignty).

Dr. Ferrer concluded that the Resolution states in an excellent way what the objectives of international cooperation are, namely: 1) the promotion of space and technology on a contractual basis or on the basis of generosity of the country; 2) the promotion of the development of space capabilities; 3) the promotion of the exchange of knowledge and technologies on a contractual basis.

Ambassador *Dr. Raimundo González Aninat* (Chile) made some comments about what was said. He stated that all presentations converged on international space cooperation. He supported Dr. Jasentuliyana in the sense that the Latin-American group in COPUOS was able to focus on the needs of the people involving the applications of space technology. In reference to Drs. Cocca's and Ferrer's presentations on the issue of Moon resources, he said that it has theoretical and doctrinal importance. However, the negotiation on the Resolution to be adopted on International Cooperation is not only the result of an implicit consensus but also of corridor conversations implying that space technologies can affect us positively or negatively because they are ambivalent technologies. The approval the 1986 Principles on Remote Sensing was very important for developing countries because it meant a change in the legal framework: the legal fact was anticipating the technical one.

In reference to the Resolution on International Cooperation, he stated that it mentions specifically the function of international law as a key issue for cooperation to occur so as to benefit all countries, particularly developing countries.

He pointed out the appearance of new branches of the law: Humanitarian Law, Nuclear Law, Space Law and Environmental Law. International instruments hierarchize humanity not as a new subject of international law but as a different entity where people apart from states play an important role.

To sum up, Dr. González concluded that we have to cooperate, there is an ethical need to establish a better world. There are strategic threads that make cooperation necessary. We need an international law more and more cooperative. There must be instruments that govern this, and scientists and technicians must cooperate.

Dr. Eduardo D. Gaggero
Member, IISL Board of Directors

Regulation of the Global Navigation Satellite System

The issue of regulation of the global navigation satellite system (GNNS) was raised during the two-day conference on the GNSS organized on 14 and 15 November, 1996, at ESTEC by the International Institute for Air & Space Law of Leiden University, the Leiden Institute for Law and Public Policy and High Keys Communications under the sponsorship of the

European Commission (DG VII), the European Centre for Space Law, the European Space Agency, and Booz-Allen & Hamilton.

The importance of the issue of regulation of the Global Navigation Satellite System was clearly underlined in introductions to the Conference by *Mr. Y. Lambert,* Director General of EUROCONTROL, *Mr. J.W. Weck,* Director General, Directorate General of the Civil Aviation of the Netherlands, and *Mr. J. Erdmenger,* Director, DG VII of the European Commission.

In his opening address, Mr. Y. Lambert stressed that the most important issue was reliability. Every one is concerned with ensuring that the system developed for satellite navigation is reliable and accurate, providing a guaranteed level of service. He went on to mention that the liability issue followed naturally from the reliability issue. He then referred to the next satellite navigation system, known as GNSS-2, which should be of real practical importance and use in the near future. Also, such technical developments did not evolve without cost considerations.

Mr. J.W. Weck added that GNSS was of great importance for civil aviation. ICAO was therefore fully involved in all discussions. Considering the technical aspects, he said Europe was developing strong cooperation under the umbrella of the European Tripartite Group: EUROCONTROL, the European Space Agency, and the European Commission. Institutional framework, legal concerns and financial problems were also mentioned as being of particular relevance in the context of GNSS.

Mr. Erdmenger focused mainly on the European role in development of the GNSS. The Maastricht Treaty gave the Community authority to involve itself in all transeuropean transport network issues. Much potential can and will be used to find legal tools to implement the new concept of transeuropean network guide: legislation interoperability, financial assistance, organization of cooperation between Member States in accordance with the Treaty on European Union, and external relations with international organizations.

The first session of the conference dealt with the technical issues, the second with the policy concerns, the third with the legal aspects and, finally, experts on these three areas met for a joint discussion.

Mr. Kraan, Air Navigation Commissioner, ICAO, was the first speaker at the first session, chaired by Mr. Erdmenger. He gave a presentation on ICAO's future systems concepts for Communication, Navigation, and Surveillance (CNS) and Air Traffic Management (ATM). The new system would offer transmission of messages and extended surveillance to serve Air Traffic Management. This would result in using available airspace and improved air traffic capacity. GNSS would provide a high-accuracy and reliable navigation service with global coverage. For the time being, there were two systems: the American Global Positioning System (GPS) and the Russian GLONASS, but they could not now meet all the requirements as determined by ICAO. In the longer term, GNSS was expected to become the primary means of navigation in all airspace and all phases of flight. Its implementation would be gradual, based on scenarios for the short, medium and long terms.

Mr. Solat from the U.S. Federal Aviation Administration provided information on the GPS. A Presidential Decision Directive issued on 29 March, 1996 announced a national policy on the future management of GPS and its augmentation, which would be carried out in two distinct phases.

Mr. Denisov, Deputy Chairman, Radio Navigation Intergovernmental Council of the CIS, made a statement on the policy of the Russian Federation in regard to GLONASS. This system was dual-purpose: both military and civil. Having given a description of the system, he explained its future development and improvement over the next few years.

Mr. Ryan from INMARSAT explained the new generation of INMARSAT-3 satellites. They each carried a navigation transponder which would be used to provide a civil complement to GPS and probably to GLONASS. He mentioned that these transponders could also become the first elements of an evolving international civil GNSS. He gave an overview of the system and described the services and role of INMARSAT.

Mr. J.P. Magny, Directorate of Telecommunications, ESTEC reviewed current thinking on the concept of the European Geostationary Navigation Overlay Service (EGNOS), which was being developed in Europe to provide GPS and GLONASS regional augmentation services to aviation, maritime and land users. EGNOS was a major element of the European Satellite Navigation Programme being implemented by the Tripartite Group: The European Commission, the European Space Agency and EUROCONTROL.

The second session dedicated to policy concerns was chaired by *Mr. S.G. Frankiss*, Head of ATM Policy at the United Kingdom Department of Transport.

Mr. Carel, Scientific Adviser, Directorate of Air Navigation, Civil Aviation Authority of France, set out the French position on the development of GLONASS and GPS. France agreed that the existing systems fell short of the levels of safety, integrity and availability required to satisfy civil aviation requirements. The French DGAC (Direction Générale de l'Aviation Civile) had supported the development of EGNOS and would continue to do so.

The presentation by *Mr. Tytgat*, DG VII, European Commission, dealt with the European multimodal transport issue. GNSS was a vital component of the Transeuropean Network. The European Union was playing an important role in taking the measures necessary to implement the system.

Mr. E. Hofstee, Director of the Aeronautical Inspection Directorate, Directorate General of Civil Aviation of the Netherlands, drew attention to the Chicago Convention, which was of particular importance in regard to States' responsibility for civil air navigation. This responsibility would remain unchanged with the introduction of the GNSS. The ICAO CNS/ATM Implementation and Operation Policy should pay attention to the already existing rules and standards.

Mr. M. Fairbanks, Transportation Team, Booz-Allen & Hamilton, completed the session on Policy concerns by discussing the management of the European contribution to GNSS. He dealt with: provisions of services, including control and quality assurance; regulation, certification and standardization, financing; cost recovery; user consultation; international

and inter-regional cooperation; profile raising, education and marketing; business analysis.

The third session dealt with the legal aspects of the Global Navigation System. It was chaired by *Mr. T. Brown,* Senior Partner at Clifford Chance.

Mr. L.J. Weber, Director of the Legal Bureau, International Civil Aviation Organization, raised the question of the need to define a legal framework for international GNSS services, but including the need to reconcile the principle of State sovereignty and the concept of seamless airspace as required by GNSS. He mentioned the ICAO CNS/ATM systems in regard to their implementation and operations, and the responsibilities of ICAO in this field. He also presented different types and forms of long-term legal framework for GNSS, including checklist, model contract, codes of conduct, guidelines, standards and recommended practices, Assembly or Council Resolutions, and international agreements. Regarding the institutional arrangements, different solutions could be applied, but Mr. Weber concluded that one reflecting the interests of both provider and user States probably had the best chance of being accepted.

The next speaker, *Mr. Henaku,* Researcher in Air and Space Law, Leiden Institute of Law and Public Policy, concentrated on the nature of the legal relationship to be applied between the various interested parties, the user, the provider, the States party to the Chicago Convention.

Mr. M. Ferrazzani, Legal Affairs, European Space Agency, pointed to the important link now existing, with GNSS, between issues in air traffic navigation and space technology programmes. He then explained the role and exposure to liability of space segment operators. Considering the specifics of space law and the theme of the Conference, he said there was a need for an international treaty covering basic legal principles such as: institutional arrangements including funding, system control, peaceful uses; service guarantee, quality, reliability; liability issues; jurisdiction, dispute settlement.

Mr. R.D. van Dam, Head of the Legal Service at EUROCONTROL, raised the issue of liability of air traffic control service and system providers. He dealt first with the liability of the ATC agencies at national and international levels. He notably mentioned that one consequence of the development of the ICAO CNS/ATM concept was a renewal of interest in the issue of ATC liability.

The afternoon session, chaired by *Prof. H. Wassenbergh,* International Institute of Air and Space Law, Leiden, took stock of various aspects and problems discussed during the three parts of the Conference, dealing with technical, political, and legal issues.

It ended with the adoption of a set of recommendations on Regulation of the Global Navigation Satellite System to be presented to the International Civil Aviation Organization two weeks later, at a meeting dealing with the same problem.

Daphné Crowther
Executive Secretary,
European Centre for Space Law

U.N. General Assembly Agrees to Hold the UNISPACE III Conference and Adopts Declaration on Outer Space Benefits

The fifty-first session of the General Assembly at the United Nations considered the item on international cooperation in the peaceful uses of outer space and adopted, without a vote, two resolutions on 13 December 1996.[1] A number of member States, including the United States and Ireland, on behalf of the European Union, expressed their strong support for the work of the Committee on the Peaceful Uses of Outer Space. Thailand and Tunisia indicated their interest in becoming members of the Committee.

Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (General Assembly resolution 51/122)

The General Assembly unanimously adopted the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (hereinafter "the Declaration") as the fifth set of principles to constitute the legal regime established by the United Nations to govern space activities.[2] Some delegates stated that the declaration would provide an excellent starting point for the consensus building exercise required for the preparation of the UNISPACE III conference.

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1 For texts of Resolutions 51/122 and 51/123, see CURRENT DOCUMENTS I AND II, *infra*.

2 The five treaties and four other legal principles relating to the peaceful uses of outer space are: Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space (resolution 1962 (XVIII)), Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including Moon and Other Celestial Bodies (resolution 2222 (XXI)), Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (resolution 2345 (XXII)), Convention on International Liability for Damage Caused by Space Objects (resolution 2777 (XXVI)), Convention on Registration of Objects Launched into Outer Space (resolution 3235 (XXIX)), Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (resolution 34/68), Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (resolution 37/92), Principles Relating to Remote Sensing of the Earth from Outer Space (resolution 41/65), Principles relevant to the Use of Nuclear Power Sources in Outer Space (resolution 47/68).

International cooperation in the peaceful uses of outer space (General Assembly resolution 51/123)

This resolution deals with the substantive work of the Committee on the Peaceful Uses of Outer Space and its subsidiary bodies. The following are the highlights of the resolution.

UNISPACE III Conference

The General Assembly endorsed the recommendation of the Committee that a special session of the Committee open to all Member States of the United Nations (UNISPACE III), should be convened at the United Nations Office at Vienna preferably in 1999.[3] A number of member States welcomed that decision, and the European Union, which had previously expressed its regservation for convening a third UNISPACE Conference, now considered that UNISPACE III in the form of a special session of the Committee would properly balance the objectives with minimal cost. Some developing countries considered it essential to provide enough financial resources to ensure that recommendations of UNISPACE III would be implemented in totality.

The General Assembly requested the Committee, the Scientific and Technical Subcommittee and the Office for Outer Space Affairs to act as the Preparatory Committee, the Advisory Committee and the executive secretariat for UNISPACE III. The Assembly also requested the Advisory Committee to finalize, at its 1997 session, the agenda and agree on a specific date for UNISPACE III as well as to work out the organizational aspects of UNISPACE III and schedule of events, such as workshops, poster sessions and trade exhibitions with the participation of relevant international, regional and other governmental and non-governmental organizations in preparation for UNISPACE III. The Preparatory Committee was requested to report to the General Assembly at its fifty-second session on the progress made in the preparatory work for UNISPACE III.

Space Debris

The General Assembly agreed that the multi-year work plan for the consideration of space debris, which had been adopted at 1995 session of the Subcommittee[4], should continue to be implemented with flexibility.

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[3] Depending on the progress made at its 1997 session of the Scientific and Technical Subcommittee in preparing an agenda for UNISPACE III, the year 2000 may be considered more appropriate. At the time of this reporting, the Subcommittee has concluded the work at its 1997 session and recommended that the UNISPACE III Conference be held in July 1999.

[4] *See* M. Sanidas, *COPUOS S. & T. Subcommittee Makes Progress on Space Debris and a Possible Third UNISPACE Conference,* 24 J. SPACE L. 133 (1996) for the list of items to be covered in the multi-year work plan.

Ireland, on behalf of the European Union, stressed that the item on space debris should be given the priority in the work of the Subcommittee, while Thailand stated that necessary measures must be taken to control space debris. The Assembly was informed that the President of the United States had directed his country to take a leadership role in international fora to adopt policies and practices aimed at debris minimization.

United Nations Programme on Space Applications; Implementation of the Recommendations of UNISPACE 82

The General Assembly endorsed the United Nations Programme on Space Applications for 1997, as proposed to the Committee by the Expert on Space Applications.[5] Some developing countries urged Member States to make voluntary contribution to the Programme, which is being carried out in the context of the implementation of the recommendations of UNISPACE 82. In connection with the recommendation that the United Nations should support the creation of adequate training centers at the regional level, the Assembly noted with satisfaction that the United Nations-affiliated Centre for Space Science and Technology Education in Asia and the Pacific had begun its first education programme in April 1996. Thailand reiterated its offer to host a branch institute of the Centre. The Assembly was also informed that Brazil and Mexico, the host countries of the Regional Centre for Space Science and Technology Education in Latin America and the Caribbean, had finalized the bilateral process of establishing the Centre to be affiliated with the United Nations. Regarding the promotion of regional cooperation in space activities, the Assembly recognized the contribution of the Third Space Conference of the Americas, held at Punta del Este Uruguay in November 1996.

Ways and means of maintaining outer space for peaceful purposes

The General Assembly requested the Committee to continue to consider, as a matter of priority, ways and means of maintaining outer space for peaceful purposes. Some countries were of the view that a mechanism of cooperation and coordination between the Committee and the Conference on Disarmament should be established.

Working methods of the Committee and its subsidiary bodies

The General Assembly endorsed the recommendations of the Committee at its 1996 session with regard to the working methods of the Committee and its subsidiary bodies.[6] The Assembly noted that in

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5 *See* A/AC.105/625, sect. I.

6 *See* M. Sanidas and J. S. Thaker, *COPUOS Session Agrees on UNISPACE III; Adopts Declaration on 'Outer Space Benefits,'* 24 J. SPACE L. 142 (1996) for more details on the work of the Committee on this item.

accordance with the agreement of the Committee at that session, the Chairman of the Committee had undertaken and would continue to hold, as necessary, inter-sessional informal consultations among the members of the Committee[7] on the measures relating to the working methods, including the composition of bureaux and election of officers, duration of sessions of those bodies and inclusion of additional items in the agenda of the Legal Subcommittee. The Assembly agreed that if consensus agreement is reached on those measures, they should be implemented during the 1997 sessions of the Committee and its subsidiary bodies as the transitional arrangements for the year 1997.

A number of countries welcomed the ongoing efforts to further improve the working methods and emphasized that such efforts should be aimed at strengthening the role of the Committee and its subsidiary bodies. Member countries of the Group of 77 and Japan stated that the principles of rotation and equitable geographical representation should be applied to future elections of officers. Regarding the decision-making process in the Committee, the United States and Argentina stressed the importance of maintaining the principle of consensus in both substantive and procedural matters.

With regard to the records of the Committee and its Legal Subcommittee, the General Assembly noted with satisfaction that the Committee had been provided, at its 1996 session, with unedited verbatim transcripts in lieu of verbatim records and that the Legal Subcommittee would be also provided, from its 1997 session, with such transcripts in lieu of summary records. As the utilization of the transcripts would result in substantive cost-savings, the chairmen of the main Committees of the Assembly were invited to examine this measure with a view to introducing it in other United Nations bodies.

Takemi Chiku
Political Affairs Officer
U.N. Office for Outer Space Affairs

Comments

Satellite Services Licensing in the European Union

The satellite services sector in the European Union has been opened to competition by Commission Directive 94/46 of 13 October 1994.[1] Such liberalisation was achieved by amending Commission Directive 90/388 of 28

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7 As of March 1997, the Chairman of the Committee has held such inter-sessional consultations four times, in late July, early September, mid-November and late February. Consensus agreement is yet to be reached, and the next inter-sessional consultations are scheduled in early April, on the margins of the Legal Subcommittee.

1 OJ L268/ 15, 19.1094) (the "Satellite Directive").

June 1990[2] which initiated the telecommunications services liberalization process, in order to extend its application to cover most types of satellite services.

As a result, EU Member States were required to withdraw all those measures which grant exclusive or special rights for the supply of satellite services. In addition, Member States were also required to take the measures necessary to ensure that any operator is entitled to supply satellite service (except services still excluded from the liberalisation). Thus, VSAT (one way or two ways), data transmissions, satellite news gathering, business TV, videoconferencing, etc. have all been liberalised.

Regarding television and radio broadcasts, the preamble of the Satellite Directive states that: "The provision of satellite network services for the conveyance of radio and television programmes is a telecommunications service for the purpose of this Directive and thus subject to its provisions."

Therefore, the transmission of a broadcaster's signal from the uplink site to a satellite for point-to-point distribution (to another studio, another uplink site, cable head ends, etc.) or point-to-multipoint (direct-to-home) distribution, can not be subject to exclusive or special rights and is accordingly liberalised. Programming content is however not affected by this directive. It remains subject to the specific rules adopted by Member States in accordance with Community law.

Voice telephony and telex were initially excluded from the liberalisation implemented by the Satellite Directive. However, voice telephony services will be opened to competition shortly. Indeed, Directive 96/19 of 13 March 1996[3] will liberalise voice telephony as of 1st January 1998 (save for less developed networks - Spain, Ireland, Greece and Portugal - or very small networks - Luxembourg - which may request a five year or a two year extension, respectively. The Commission is however reluctant to grant such extension periods and it is likely that they will be shortened). Furthermore, the exclusion of telex from the liberalisation implemented by the Satellite Directive has been removed by Directive 96/19 and Member States should have liberalised telex services as of January 1997.

While satellite services may be liberalised, some form of authorisation may nevertheless be required to provide them. Indeed, Member States may make the supply of telecommunications services subject to a licensing or declaration procedure aimed at ensuring compliance with essential requirements.

The definition of "essential requirements" has been recently revised in Directive 96/19. These are the non-economic reasons in the public interest which may cause a Member State to impose conditions for the provision of telecommunications services. This includes inter alia the efficient use of the frequency spectrum and the avoidance of harmful interference between radio-based telecommunications systems and other space-based or terrestrial technical systems.

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2 OJ L192/10, 24.7.90 (the "Services Directive").

3 OJ C74/13, 22.3.96.

The Satellite Directive introduces the concept of proportionality in the authorisation process. That is, licensing is not justified where a mere declaration procedure would suffice to ensure compliance with essential requirements. For example, the provision of a satellite service which only involves the use of a dependant VSAT earth station in a Member State should only be subject to a declaration in this Member State.

Member States must also ensure that the conditions for the granting of licences are objective, non-discriminatory and transparent, that reasons are given for any refusal and that there is a procedure for appealing against any such refusal. They must ensure that fees imposed on providers of services as part of authorisation procedures, shall be based on the same criteria. They shall publish, in a sufficiently detailed manner, the fees, the criteria on which they are based and any changes thereto.

Accordingly, the conditions which can be imposed by Member States to grant licences for satellite services must be limited to ensuring compliance with essential requirements and must be based on objective, non-discriminatory and transparent criteria.

In spite of this limited degree of harmonisation in licensing conditions, there is no mutual recognition of licences for satellite services. Such services may therefore be subject to licensing or declaration procedures in all Member States in which they will be provided.

Furthermore, Member States can have diverging views as to which essential requirements are applicable to satellite services. Likewise, there can be diverging interpretations as to the meaning of a given essential requirement or as to what objective, non-discriminatory and transparent criteria are. In addition, Member States have developed different administrative procedures to deal with licensing requests and to demonstrate compliance with the essential requirements. The application may require the provision of different type of information. The national language will need to be used in the application and in correspondence with the national regulatory authority.

Thus, if a satellite communications services provider wants to offer its services on a pan-European basis, it must apply for a licence in each Member State in which it wishes to operate the service, the application procedure and the licence conditions may vary from country to country. This is a significant problem because, by their very nature, satellite services are normally intended to target vast geographical areas covering more than one Member State.

For this reason, a draft directive specifically addressing the mutual recognition of licences and other national authorisations for the provision of satellite network services and/or satellite communication services has been proposed by the commission in January 1994 (COM(93) 652 final, 4.1.94). However, it has not been adopted and has been shelved as Member States could not reach an agreement on its terms.

The EU has recently adopted the long-awaited Directive on a common framework for general authorisations and individual licenses.[4] This

[4] Not yet published in the Official Journal (the "Licensing Directive").

Directive which is not restricted to satellite services, is less ambitious than the previous one as it no longer purports to achieve mutual recognition of licences. It is now limited to establishing a common framework for general authorisations and individual licences. Nevertheless, it will make the provision of pan-European services much easier to achieve.

The Directive sets out a general vs. individual licensing scheme. The general rule is that Member States must ensure that telecommunications services and/or networks can be provided either without authorisations or on the basis of general authorisations (that is, an authorisation which does not require the undertaking concerned to obtain an explicit decision by the national regulatory authority before exercising the rights stemming from the authorisation). Member States may issue individual licences only where the beneficiary is given access to scarce resources. Member States may issue individual licenses only where the beneficiary is given access to scarce resources, access to public and private land, or where obligations are imposed in relation with mandatory provision of public telecommunications services or, in conformity with Community competition rules, where the licensee has significant market power (according to the concept contained in the Interconnection Directive). As satellite telecommunications require the use of radio frequencies, they may be subject to individual licensing procedures.

It provides that licensing conditions must be objectively justified in relation to the service concerned, non-discriminatory, proportionate and transparent. As seen above, such requirements already exist under the Satellite Directive. However, the Directive goes much further in harmonising the licensing conditions as it specifically enumerates the conditions which may be attached to general authorisations and individual licences.

The procedure for granting licences is also improved as Member States are required to ensure that information concerning the procedures for individual licences is published. Such procedure shall be open, non-discriminatory and transparent. The Member States shall, in addition, set reasonable time limits to inform the applicant of its decision. While a six weeks period is stated as being the rule, it can be extended by up to four months in objectively justified cases which should be specifically defined. In comparative bidding procedures Member States can further extend this time limit by up to four months.

Save in the case where the number of licences is limited to ensure the efficient use of radio frequencies or to make available sufficient numbers, a licence can only be refused in cases where the applying undertaking does not provide the information which is reasonably required in order to demonstrate that it fulfils the conditions imposed by the Draft Directive. The grounds to withdraw, amend or suspend a licence are also limited to cases where the licence holder does not comply with a condition attached to a licence. In such event, the licence holder should be given the opportunity to state its views. The licence holder will be given two months to remedy the breach. Member states are also requested to lay down a procedure to appeal against a decision withdrawing, amending or suspending a licence to a body independent from the national regulatory authority.

Generally speaking, fees imposed as part of the licensing procedure must only cover the administrative costs incurred to issue, manage, control and enforce the applicable individual licence. However, where scarce resources are used, Member States may impose charges which reflect the need to insure the optimal use of these resources provided that they are non-discriminatory and take into account the need to foster the development of innovative services and competition. Such provision will certainly concern operator, as it introduces a significant degree of uncertainty on a fundamental licensing term.

While the Directive does not establish a one-stop shopping procedure, it proposes to establish one in the future. In this respect Article 13 states that "the Commission shall take the steps necessary for the operation of a one-stop-shopping procedure for the grant of individual licences (_)."

By extending the Services Directive to cover satellite services, the Satellite Directive has achieved a significant degree of liberalisation in the satellite services sector. The licensing or authorisation conditions set out in the Services Directive have now been extended to cover satellite services. Accordingly, licensing must only aim at ensuring compliance with the "essential requirements" and Member States must ensure that the conditions for the grant of licences are objective, non-discriminatory and transparent.

Nevertheless, the situation regarding licensing is not entirely satisfactory because, for the time being, licences must still be obtained in each country where a service is intended to be provided. Therefore, the licensing procedure and licensing conditions (and fees) may vary from country to country.

Thus, although the harmonisation of licensing conditions has been implemented to some extent by the Licensing Directive, the lack of uniform licensing framework remains a problem for pan-European satellite services providers. The situation should, however, be substantially improved since the Directive is adopted as licensing conditions and procedure will be further harmonised. It is however unfortunate that such harmonisation does not cover licensing fees. In addition, until such time as the proposed one-stop-shopping procedure is in place, licensing will still need to be addressed on a country by country basis.

Stéphan Le Gouëff *

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Case Developments

ICO Global Communications of London whose satellites are under construction and scheduled to be launched in 1998, in a petition dated March 12, 1997 requested the U.K. High Court to revoke TRW Inc.'s European patent on a design for a satellite constellation for mobile telephony. TRW has received patents in the United States and Europe laying claim on a design for a system similar to that of ICO Global.

Short Accounts

Space Debris in Focus at Darmstadt

Over the last decades the concerns of individuals and nations about the danger and extent of damage that space debris can cause to astronauts and spacecraft has considerably increased.

The discussions of NASA and ESA experts with the participation of around 200 officials from 18 countries, at the Second European Conference on Space Debris in Darmstadt, Germany, during the third week of March, 1997, revealed that a piece of debris as small as four-hundredths of a centimeter impacting a shuttle window can cause enough damage to require its replacement. A one millimeter piece of debris hitting the leading edge of the shuttle's carbon wings can penetrate the surface.

One of the problems is tracking debris. Currently, the National Space Surveillance Center in Colorado Springs can only track about 8500 objects of about the size of a tennis ball in LEO. However, the smaller size objects -- of which there are many thousands in LEO capable of causing significant damage while traveling at more than 10,000 km per second -- cannot be tracked by ground radar.

Protective measures against damage by space debris include prevention or minimization of explosion risks, designing of dual layered shields, development of guidelines for manufacturers of satellites and rockets to lessen their debris-forming potential, and placement of satellites at less crowded, higher (graveyard) orbits at the end of their useful lives.

Lessons from the Prevention of Air Accidents

Since 1984 the Académie Nationale de l'Air and de l'Espace has held every other year highly successful international conferences on aviation security. This year's colloquium was devoted to legal and financial aspects of this important subject and attracted 135 participants from all over the world. Representatives from international organizations such as the ICAO, IATA and Eurocontrol as well as from industry (Airbus, Airlines, Bureau Veritas, etc.) and internationally renowned scholars presented more than 25 papers on a variety of themes.

With such a wealth of well documented information it is difficult to mention all speakers individually. Nevertheless, I would like to recall some contributions as samples of the high and different interest level.

Captain *John Savage* spoke on flight data recording contributing to a "Feedback Loop" within BA's safety management system in order to enhance flight safety.

General *Alain Didier* presented in the Session on Human factors a discussion of the relation of medical control of flight personnel and the prevention of accidents, a subject seldom treated before.

Professor *Lucien Rapp*, Director of the Institute of International Studies at Toulouse, spoke about experience feedback in the aeronautical industry.

Finally, *Pierre Vellas*, the President of the Académie National do l'Air and de l'Espace, stepping in for two speakers who were unfortunately prevented from attending at the last moment, gave a most interesting speech on the influence of penal liability on the prevention of accidents.

The last session was devoted to financing of necessary actions for reinforcement of the prevention of accident with valuable comments by Mr. *Roderick* (Aviation Safety Consulting), Mr. *Suggs* (Chairman Petroleum Helicopter Inc.) and *Colin Mannin* (Principal Legal Consultant Airbus Industry). An animated discussion and a synthesis followed before the closing of this successful colloquium.

Many of the discussion while dealing basically with air law issues -- such as safety management, the impact of penal liability on accident prevention, medical check-up on flight personnel and some aspects of financing -- have instructive relevance to issues with which space lawyers are grappling.

The proceedings of the various Toulouse conferences are published by the Académie and those who attended this colloquium may look forward to the publication of its proceedings, in order to re-experience once again the interesting and highly informative ambiance.

The next conference on the prevention of air accidents is planned for 1999 and my best advice for aerospace lawyers is: Be sure not to miss it!

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

Celebrating the 30th Anniversary of the Outer Space Treaty

On Occasion of the 36th Session of the Legal Subcommittee (LSC) of the United Nations Committee on the Peaceful Uses of Outer Space in Vienna, the International Institute of Space Law (IISL), in cooperation with the European Centre for Space Law (ECSL) organized - as in previous years - a Symposium. It took place shortly after the opening of the Session of LSC on April 1, 1997.

Dr. Nandasiri Jasentuliyana, President of the IISL, Deputy to the Director General, United Nations Office at Vienna, and Director, Office of Outer Space Affairs, had requested *Dr. Ernst Fasan*, Honorary Director of IISL, to serve as Coordinator, and *Mr. Jitandra Thaker*, Legal Officer to the UN Outer Space Affairs Office, to act as Rapporteur.

Fasan welcomed the audience which consisted of most of the delegates of the Legal Subcommittee Meeting, and of several other attendants, and indicated the Agenda as follows: First, there would be the papers by three distinguished authors, namely: *Professor Dr. Yuri M. Kolosov,* Chair of the Moscow Institute of International Law and Minister Extraordinary and Plenipotentiary of the Russian Federation; then would follow *Dr. Ram Jakhu,* Professor and Director of the Master of Space Studies Program of the International Space University, Strasbourg. The third panelist would be *Dr. Frans von der Dunk,* Co-Director, International Institute of Air and Space Law of Leiden University.

Following this, as commentator would serve *Dr. Vladimir Kopal,* Professor at Charles University, Prague, and General Counsel of the International Astronautical Federation (IAF).

After a 'discussions and questions' period, one of the highlights of the Symposium would be a book presentation by *Dr. Gabriel Lafferranderie,* chairman of the ECSL, and legal adviser of ESA. The coordinator pointed out that the topic of the symposium was not on the Agenda of the Legal Subcommittee for this year and expressed his hope that the papers presented would informally provide some background information for the audience. He then called on the first speaker.

Kolosov reported on "Background and History of the Outer Space Treaty." He said that the international law of outer space started in the 1950's, and paid tribute to many early authors. But he made clear that the crucial role in this field of law belongs to the UN Outer Space Committee (COPUOS) with its Legal and Scientific-and-Technical Subcommittees. He pointed out that within merely three and a half decades COPUOS drafted and the UN General Assembly adopted five major Outer Space Treaties and five Sets of Principles. The author gave a detailed history of the relevant development, beginning with the UN resolutions 1472 (XIV) and 1721 (XVI), the USA-USSR agreement on the ban of nuclear weapons or other weapons of mass destruction in outer space. He then discussed the Outer Space Treaty itself and demonstrated, how the following space agreements elaborated principles to be found in that very basic treaty. In Kolosov's view the five treaties served "as a basis of international cooperation in the exploration and use of outer space, one of the global provinces of mankind."

Jakhu spoke on the "Application and Implementation of the Outer Space Treaties." He pointed out that "it has been perhaps the finest achievement of diplomacy and statesmenship of those involved in its negotiation and drafting, especially during the height of the cold war, when the world was deeply polarized in two diagonally opposed political and economic systems.

He then discussed the applicability of the 1967 Treaty not only to states but to private entities as well, discussed the terms "space object" and "component parts" and went on to criticize both the Liability Convention and the Moon Agreement which, in his view, contained "confusing. inconsistent and inadequate" provisions. He also doubted that the UNGA resolutions of 1982 on Direct Broadcasting and of 1986 on Remote Sensing would create a "solid, comprehensive and effectively

implementable legal regime." In conclusion, he proposed, that a small group of scholars representing the major spacefaring nations and various regions of the world could be entrusted with the task of examining the space treaties and create a comprehensive draft treaty which would include the well respected and adopted principles, clear rules of law, definitions of unambiguous terms, an efficient dispute settlement mechanism, and sufficient provisions for amendment.

The next speaker, Von der Dunk, reported on "Future Developments Relating to the Outer Space Treaties." He discussed *in extenso* the Outer Space Treaty in relation to private enterprise and national legislation. He proposed that following the example of the USA, Sweden, the United Kingdom, Russia and South Africa, other states should establish national bodies for space legislation. He then demonstrated in detail the provisions of the United States Communications Act of 1934, the first Commercial Space Launching Acts of 1984 and 1988, and the first Remote Sensing Acts of 1984 and 1992. The speaker also explained the Swedish Act on Space Activities of 1982, the UK Outer Space Act of 1986, the Russian Federation's Law on Space Activities of 1993, and the South African Space Affairs Act of 1993. He demonstrated how "the ever increasing involvement of private enterprise in mankind's space endeavor has a direct legal component to the future of the Outer Space Treaty....States should, consequently, authorize and continuously supervise....Space Activities and should....exercise the jurisdiction and control they retain over objects launched into outer space..." He concluded that the future of the international space treaties lies in national legislation related to space activities.

In his role as commentator, Kopal, discussed "The significance of the 1967 Outer Space Treaty for the Establishment and Development of Space Law of our Times." He started with paying tribute to the very first author on Space Law, namely the Czech Professor Dr. Vladimir Mandl, who had as early as 1932, a study on space law published under the heading "Das Weltraum-Recht: Ein Problem der Raumfahrt" (The Law of Outer Space: A Problem of Space Flight). Mandl has already postulated the notion of *coelum liberum*, and of the complete freedom of spaceship traffic. The text of Mandl's writing would appear soon in a book, prepared by Dr. Stephen Doyle in English translation.

Kopal also mentioned the works of Welf Heinrich, Prince of Hannover, and the efforts of the Institute of International Law, the International Law Association, as well as the space law lectures at the Hague Academy of International Law, especially the courses presented by Prof. Manfred Lachs. He also underlined the importance of the works of the Institute of Air and Space Law, McGill University in Montreal (Chairmen: Prof. John Cobb Cooper, Prof. Eugene Pépin, and Prof. Matte) as well as the Institute of Air and Space Law of the University of Cologne (Chairmen: Prof. Alex Mayer, and Prof. Karl-Heinz Böckstiegel).

He then underlined the importance of the three papers delivered today. He expressed his opinion that at present "space law" consisted of the "two layers" namely, on the one hand, the layer of international law, as

established by the United Nations, plus bilateral as well as multilateral treaties, and, on the other hand, the layer of national laws. Therefore, he voiced his opinion that the Legal Subcommittee "should now start studying the newly emerging legal issues and report them regularly to COPUOS and through it to the General Assembly." This would be a constructive way to improve and further develop its work on space law.

The 'questions and answers' period, started by a question of the representative of China, *Prof. Huang Huikang* about future input to the Legal Subcommittee. In answering, Prof. Jakhu mentioned Article VI of the Space Treaty, Dr. von der Dunk referred to the growing importance of private enterprises, and Prof. Kolosov pointed out the multiplying number of legal problems. The distinguished delegate of Russia said that there was a brilliant past of the LSC, and its work into an unknown future would make it necessary for the LSC to seek new issues for the future. Finally, *Dr. Kröner* from the Netherlands and Prof. Kopal discussed the "freedom of access" principle which, as Kopal pointed out, was guaranteed only with respect to celestial bodies.

Then Lafferranderie took the floor and presented the new important book "Outlook on Space Law Over the Next 30 Years", which he humbly characterized as a "modest contribution." He explained that the "players are of course no longer the same, as at the time of the creation of the Space Treaty, the two superpowers, the USA and the USSR, were the ...primary movers of the legal texts." But now, these powers have been joined by many other players, and now private firms have also become active in the space field. Lafferranderie underlined the importance of COPUOS; but mentioned also ICAO, UNESCO, WIPO, WMO and, as specifically concerned with space, Intelsat, Eutelsat, Inmarsat, ESA, Eumetsat, Arabsat, Intercosmos, and also COSPAR, the Astronomical Union, IAF, and IISL. Additionally, he explained content and organization of the book, with more than thirty contributions. He concluded that it was "an honor for me, as the Chairman of the European Centre for Space Law, to present the book to Dr. Jasentuliyana as a token of gratitude for the work...of the LSC, and as encouragement for the years to come." He also expressed special thanks to the Chairman, *Dr. Mikulka.*

In conclusion, N. Jasentuliyana expressed his pleasure "to accept this book on behalf of the United Nations and also the Legal Subcommittee of COPUOS, whose members were also presented with copies of the book this afternoon." He explained the timeliness of the publication as space activities have continued to grow at a tremendous rate, calling for a new look at space law. Jasentuliyana congratulated Dr. Lafferranderie and the contributors of the book. He then closed the Symposium with thanks to the speakers and the coordinator.

An informal reception closed the event.

Dr. Ernst Fasan
Honorary Director, IISL

Assicurazione Generali's Recent Space Insurance Conference

The bi-annual conferences of Assicurazione Generali have become the leading international event in the field of insurance of space activities. The 9th Generali Space Conference held in Venice, April 17-18, 1997, has been no exception. The learned presentations included a variety of topics ranging from US Air Force Research on Ground-Based Imaging and Observation Satellites, to programs and directions involving Sea Launch, the Delta Launch Vehicle, the Indian Space Organization, International Launch Services, the EuroSkyWay Platform, and the Aerospace Corporation.

The legal aspects associated with space insurance have been touched upon in the paper of *John S. Korda* who stressed the proliferation of legal issues in light of the changing environment of the space insurance market and the effects of the growing availability of funds as well as the insurability of new technologies. He pointed to the need for a better understanding of the technical complexities of the new space systems.

There were two other major contributions with legal orientation. The first elaboration was presented by *Dr. Benito Pagnanelli* on Commercial and Industrial Activities in Space: Insurance Implications. He referred to some of the significant innovative trends in the insurance market, noting that litigation has been on the rise between insurers and those insured because of the need to interpret the language of insurance policies and contracts signed between manufacturers and customers. He also stressed two points: (1) the number of anomalies in satellites appear to be constantly on the rise because technology is constantly evolving and (ii) there appears to be a tendency to under-insure the value of satellites.

Among a variety of hazards *Pagnanelli* mentioned solar radiation which can give rise to many interferences with the activity of satellites; meteor storms of particular intensity which are expected to occur in 1998 and 1999; and the increasing fears over the issue of the number and volume of space debris and NASA's concern for the consequences they have had on space shuttles which in the past few years have sustained damages from collisions with erratic debris. In his view, many of the issues lead to the problem of third party liability deriving from space activities. He felt that the way liabilities are being regulated both at international and national levels will definitely need rethinking as well as coordination.

The other discussion with legal orientation was presented by *Edward A. Frankle,* NASA's General Counsel, under the title "The Reusable Launch Vehicle: Commercial Issues in a Technology Program." He discussed the current first phase of the Reusable Launch Vehicle (RLV) program which involves the construction and flight of the X-33 technology demonstrator. The second phase will be the construction of the full scale RLV to be followed by the initial RLV flights to orbit and back, leading eventually to routine commercial operations. He stated that the vehicle is being built by and will be owned by a private sector company, not by a government. Hence private sector resources will be at risk and typical governmental protection and immunities will not apply, creating possible problems with respect to third party liability. Similarly, traditional

indemnification authority will not be available nor will the NASAct be applicable as the X-33 will not be a NASA vehicle. The level of uncertainty surrounding a new vehicle like the X-33 will make third party insurance much less available. Frankle stressed the role that insurance may have to play in the achievement of an operational RLV. The success of the RLV will challenge an entire range of laws and policies. An operational RLV would be moving space flight closer to the regime of air travel. Landing an intact launch vehicle in a different country would constitute the export of the launch system to the country in which the vehicle landed. Also, since any vehicle capable of reaching space is considered to be a "missile," the export of that vehicle to a country in which it lands implicates the current Missile Technology Control Regime. If you have an RLV system that can take off from and land in many places around the globe, does a neighboring country have rights to restrict overflights, like it does for aircraft, but not for spacecraft? Are current treaties which control the uses of space and allocate liabilities based on strict liability of the launching state adequately addressing the legal issues involved in commercial operations of an operational RLV? Mr. Frankle concluded that the world community will have to address these and many other issues in as little as 4 or 5 years if the X-33 is successful and leads to a commercially viable RLV.

Executive and Congressional Notes

Vice-President Al Gore chaired a symposium in December 19960 to consider a multidisciplinary Origins Program to answer fundamental questions about the origin of the universe, galaxies, stars, planets and even life itself. The Search for Origins, at which several current and planned NASA missions aim,* purports to fill the missing links in a fifteen billion year-long history from the birth of the universe at the Big Bang to the profusion of life on earth and perhaps elsewhere.

Religious leaders may recall the story of creation from the Old Testament of the Bible: in the beginning God created heaven and Earth, and said let there be light, let us make men in our image, and let them have dominion over all other living things. New scientific discoveries suggesting that planets beyond our solar system where life in some form may have existed even before it existed on earth or does in fact exist -- may shake the foundations of some religious beliefs. Scientists and religious leaders have been trying to adjust to these issues. Copernicus discovered that the Earth was just another planet revolving around the sun, and it took religion time to adapt to the change and it will no doubt continue to adapt as science explores new galaxies beyond this solar system. There are other solar systems. It appears that our galaxy is just another galaxy among hundreds of billions of galaxies and is not in the center of anything.

Humans have always tried to place themselves in a special place in the universe. The last thing we have to hold on to as being special is that we

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* NASA and National Research Council, *The Search for Origins* (1996).

are the only life in the universe. However, the recent rock from Mars, showing possible signs of past life and possible ocean of water on one of Jupiter's moon's 'Europa' cast scientific doubt on the idea that life originated on Earth and only exists here. It is important to realize that the universe and the Earth was not created for us necessarily. Perhaps creation is more extensive than was once understood. This does not have to threaten people's religious beliefs and create anxiety, except for those who are much more concerned about the dominance of human beings.

As discoveries unfold, scientists will look to religious leaders for help in translating scientific findings to their communities. Discussions are beginning to take place between science and religion to show that science does not have to be disturbing to religious beliefs and that they are quite compatible.

The Origins program is an exciting endeavor for the world. Its scope and magnitude will be decided by the President and Congress when they consider NASA's budget and funding for future space missions.

Budgeted amounts requested for NASA by President Clinton in early February 1997 decrease over the next 3 years after that the budget would level off from the year 2000 to 2002.

International Developments

Under a recent bilateral agreement between *Russia and the US,* Russia has agreed not to sell more than eighteen commercial launches into geostationary orbit between January 1996 and December 2001. The accord leaves open the possibility of expanding this to twenty launches depending on market conditions.

NASDA, the Japanese and CNES, the French space agency signed a long-term inter-agency cooperative arrangement in *Tokyo on Nov. 18, 1996.* The agreement deals with the Earth environment and climate change, human activities in space, study for future missions, research and development of satellite technologies for an information highway infrastructure, solar system exploration, personnel exchange, and a joint symposium in space activities to be held in France in 1997.

The *WorldAid '96* Conference and Exhibition took place at *Palexpo,* Geneva, from *Sept. 30 - Oct. 4, 1996.* Its purpose was to develop a global approach to emergency telecommunications. The ITU together with the United Nations and other international agencies and satellite system operators stressed the need for an international convention to remove the regulatory, licensing and customs barriers which slow down the importation and operation of communications equipment or prevent effective use of available telecommunications equipment. The same applies to organizational barriers which can slow down the exchange of necessary information about disasters.

As a follow-up to the Beatenberg, Switzerland (May 31 - June 3, 1994) conference, a *Second International Lunar Workshop* was held *October 14-17, 1996 in Kyoto, Japan.* Four working sessions were devoted to the origin of the moon and evolution of the Earth/Moon system, the importance

of near term technology demonstrations on the lunar surface, utilization of lunar resources and environment, lunar infrastructure development, and the necessity of basing an international lunar program on the guidelines proposed at the Beatenberg workshop.

The theme of the *1996/97 World Telecommunication Development Report* is Trade in Telecommunications. The Report shows that telecommunications trade in 1995 amounted to $96 billion compared with less than $50 billion at the start of the decade. The telecommunications services market has grown from just under $400 billion in 1990 to over $600 billion in 1995. Opportunities for foreign investment are now increasing.

Globalstar, Iridium and Odyssey signed a spectrum sharing and segmentation agreement to be used by their mobile telephones. The companies are championing a set voluntary principles which would guide countries in developing regulatory policies for mobile satellite systems.

On *December 11-15, 1996,* a regional telecommunication development conference for the *Arab states* (AR-RTDC-96) was held in Beirut, Lebanon, addressing issues for balanced telecommunication development for global integration. During AR-RTDC-96, France's Télécom and INMARSAT provided high quality telemedicine transmissions between Toulouse and Beirut which involved live by-pass surgery.

Topics of discussion of the *International Spaceports Symposium* on Feb. 10-12, 1997, in Cocoa Beach, Florida, included the latest technical information on international launch site capabilities in order to accommodate orbital space vehicles. In addition to various continental U.S. spaceports, launch facilities operated by foreign space interest, such as Russia (Ukraine), Japan, and French Guiana were also included.

At a *Symposium* held *February 13-14, 1997,* government and industry officials appeared to be in agreement that space debris currently does not cause serious threat to communication satellites like Iridium and Globalstar. Experts, however, disagreed as to how severe the space debris situation might be in future years and what steps should be taken by government and industry to deal with the problem.

An international interdisciplinary symposium on *space tourism* addressing potential interests of investors in space camps, orbit hotels, *etc.,* was held *March 20-22, 1997 in Bremen, Germany.*

Globalstar has received Canadian license to offer low-Earth-orbit mobile hand-held telephone service in Canada.

ITU's recent Report on the *Sixth Regulatory Colloquium* on the Changing Role of Government in an Era of Telecom Deregulation states *inter alia* that while competitive principles have started dominating worldwide markets there remains regulatory segmentation and monopoly control at a national level in many countries. The report also notes that increasing globalization will tend to mitigate regional differences in the next few years, and may compel a greater and faster degree of harmonization of industries and practices across all regions.

There were thirty-two initial signatories to the ITU Memorandum of Understanding on *Global Mobile Personal Communications by Satellite*

which is to be registered by the ITU and remain open for signature by many more organizations during the coming months.

ITU's *World Telecommunication day on May 17, 1997* was devoted to telecommunications and humanitarian affairs and focused on the vital link between telecommunications and emergency relief operations which follow natural and man-made disasters, such as cyclones, earthquakes, or wars.

Asia TELECOM 97, one of the biggest telecommunications event ever held in the region, which is taking place June 9-14, 1997 in Singapore's World Trade Centre, is the eighteenth telecom event since World TELECOM was first held in Geneva in 1971. The regional events covering America's, Asia and Africa TELECOMs were introduced in 1985 in order to address the more specific concerns of the individual regions. Asia TELECOM 97 is to feature not only vast range of telecommunications-related products and services but also to focus on the latest telecommunication developments and growth, evaluate future trends, and discuss strategies for both the developing as well as the industrialized world.

Other Events

Teledesic Inc. plans to launch 288 satellites by 2002 to form an "Internet in the sky," orbiting at more than 800 miles in the air, far lower than current communications satellites which orbit 22,500 miles up.

Sea Launch Co. is building a mobile, ocean-based satellite launch platform

The U.S. Space Foundation's *1997 National Space Symposium* on April 1-4, 1997 in Colorado Springs, under the theme "Promise of Space," addressed the challenges facing the commercial space industry, the market outlook of global launch industry, the queries of mobile satellite communications applications, the market approach to earth remote sensing, the international space station, space exploration, and the importance of space to national security.

The space related discussions of *Global Air & Space '97* - International Business Forum and Exhibition on May 6-8, in Arlington, Virginia, focused on issues of commercialization and privatization involving the international space station, remote sensing, military space policy, global regulatory issues, telecommunications and space launches.

The *AIAA Legal Aspects Committee* held its annual meeting May 7, 1997, in Crystal City, focusing on reusable launch vehicles, orbital debris, space related disputes, space insurance and several developing issues in space law.

The 12th *Man in Space* Symposium meeting June 8-13 1997, in Washington, DC dealt with "The Future of Humans in Space."

The *Korean Association of Air and Space Law* and its President, Prof. Dr. Doo Hwan Kim, hosted a conference on June 22-26, 1997, in *Seoul.* The sessions involving space law dealt with the Challenges of the Peaceful Uses of Outer Space, Current Issues of Safety, Defense and Liability, Legal

and Policy Issues of Aerospace Objects, and Prospects in the Coming 21st Century.*

Special interdisciplinary sessions of the XI International Symposium on *History of Astronautics and Aeronautics* held in *Moscow* and *St. Petersburg,* June 4-9, 1997, included International Scientific Cooperation, Astronautics and the Global Problems of Humankind, the Making of Planetary Civilizations, and Conservation of the Scientific Heritage.

Brief News

An international team of astronomers believe that super clusters, giant globs of galaxies, are arranged in a huge three dimensional chess board extending throughout the universe. If true, this would mean that the explosion that began the universe scattered its debris with more geometric precision than any other prior blast; it would mean *new laws of physics.* Could there still be a force other than gravity that could arrange super clusters into geometrical array? Corrections to Newton's law lead to theories of relativity. Could the new findings also serve as corrections to Einstein's theories? Who is to say whether it will be order or chaos?

Scientists believe that the sun is entering a *less active solar cycle,* a decade of mild "space weather," with fewer power blackouts, less radio interference and perhaps slightly cooler Earth temperatures.

According to some astrophysicists the *universe will not change* much during the *next 100 trillion years* or so. After that stars will eventually die off and the time will come when there will be no stars left. There may be some brown dwarfs around, too small to become stars, but the universe will be dark and lonely and it will stay that way until about 10 trillion trillion trillion years from now and then things will get worse. After that *nothing will be left except black holes* until about 10000 trillion trillion trillion trillion years from now. When the black holes are gone nothing will be left except subatomic particles, electrons, positrons, neutrinos and photons. The only good thing in all this is that the end is really not that near.

Contrary to the traditional views of exobiologists, which focused on surface life, there is now belief that *life* might exist *in a hidden biosphere* of terrestrial darks, hells and ices. This theory embraces the possibility of life on the moon; Mars; two moons of Jupiter; the large asteroids; and Pluto, the solar system's outermost planet.

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* Invited participants included: H.E. Judge Gilbert Guillaume, Dr. Nandasiri Jasentuliyana and Professors: Bin Cheng, Dr. I.H. Ph. Diederiks-Verschoor, Stephen Gorove, Dr. Michael A. Milde., Prof. Dr. H. A. Wassenbergh; Drs. Setsuko Aoki, A.M. Balsano, Cheng Chia-Jui, Soon Dal Choi, Yasuaki Hashimoto, Soon Kil Hong, Han Hwangbo, Toshio Kosuge, S. Sothi Rachagan; Lt. Col. Sung Hwan Shin, Kunihiko Tatsuzawa, H. Peter van Fenema, Dr. Seung Kyu Yang and Yilin Zhu.

Scientists found evidence that a *huge asteroid* may have smashed into the earth 65 million years ago and most likely *killed off the dinosaurs.*

On February 20, 1997 the *Galileo* spacecraft flew within 363 miles of the surface of Jupiter's moon, Europa, providing photos suggesting possible blocks of ice above an ocean.

In the course of the recent *Hubble* repair mission, Discovery astronauts conducted an extra space walk to pitch the insulation on the Hubble. Astronauts in the course of their space walk discovered a number of cracks in Hubble's' thin insulation as well as holes punched into the solar panels by micro materialites. Astronauts patched the foil insulation during their forth space walk. Earlier they had installed a new computer switchboard, digital recorder and a flywheel assembly which helps aim the telescope. When an eight-inch square fragment of an exploded Pegasus rocket was due to pass within a half mile of the shuttle and telescope, the astronauts steered the shuttle and the moored Hubble into a two-and-a-half mile higher orbit to extend the lifetime of the telescope.

The next time the 3.1 billion Hubble observatory is scheduled to be serviced to permanently fix the telescope's sun ravaged insulation will be in 1999. At that time, Hubble is to be equipped with a new camera, a computer, and solar wings. It is expected that Hubble will operate until at least 2005.

The *Hale-Bopp* comet came closest to the Earth on March 22, 1997 and to the Sun on April 1, 1997. Discovered July 23, 1995 by amateur observers, the comet appeared much brighter than last year's comet Hyakutake and its length, including its bluish tail, was longer than 93 million miles, the distance from the Earth to the Sun.

Because of a faulty fuel cell in a power generator the space shuttle *Columbia's mission* launched April 4, 1997 was cut short by 14 days permitting astronauts to complete no more than 15 percent of their planned experiments. They planned to study plants' reaction to the space environment and the spread of flames in weightlessness which were expected to yield cleaner and more efficient fuels as well as improved firefighting techniques and benefit future space travelers.

TCI Satellite Entertainment launched its Tempo communication satellite on March 7, 1997 to provide direct broadcast services, such as movies, sports, pay-per-view, along with traditional programming from local cable operators. TCI expects to offer more than 100 channels by the end of 1997 and 150 by 1998 in addition to local programming.

The *Cassini* spacecraft, powered by nuclear-fueled radioisotope thermoelectric generators, is scheduled for lift off on October 6, 1997, on a seven-year mission to reach Saturn in July 2004. Cassini is expected to relay back valuable data and pictures every day for four years.

Geostationary orbiting operational weather satellites will be placed into *storage orbits* ready to replace operational spacecraft on less than a week's notice. The on-orbit storage system would be less costly than storing the spacecraft in a ground facility.

U.S. and Russia are conducting a series of cooperative flights in preparation for operations on a new, U.S.-led, international space station.

The fourth American astronaut to take up temporary residence on the Russian space station, *Mir*, replaced another U.S. astronaut who stayed 118 days aboard Mir. The flight of Atlantis in January was the fifth of nine flights planned to Mir through mid-1998. Astronaut John Blaha, the third American to live on Mir, circled the Earth more than 2000 times and traveled 49 million miles. Also, an astronaut and a cosmonaut took the first joint U.S.-Russian walk in space on April 29, 1997. The Atlantis returned to Mir on May 15 1997 for another exchange of U.S. astronauts and a resupply of needed materials.

Space station construction is officially scheduled to begin in November with the launch of the *Functional Cargo Block,* atop a Russian Proton rocket to be followed in December by the launch of Endeavour to deliver a pressurized node to link other space station modules. However, likely delays in the launch sequence would push the first Russian launch to June and Endeavour's flight to July 1998.

ESA's Huygens probe, to be launched by NASA on October 6 for a seven year voyage, will study Saturn's biggest moon, Titan, for water, signs of life and much more. ESA plans to collect electronic signatures to be put on a computer disk aboard the Huygens.

ESA has defined a formal policy and established an alert system to notify organizations about problems or failures associated with equipment, components and software used in space projects. The system will be reviewed in mid-1997 and is expected to be widened to incorporate additional national and also international partners.

The *Automated Transfer Vehicle,* a European-built spacecraft to be launched by Ariane 5, is to provide logistic support for the international space station. The first flight is targeted for 2002 to be followed by launches at a rate of about one every 17 months until 2013.

NASDA, the Japanese space agency, has set up the Space Station Integration and Promotion Center in Tsukuba Space Center to conduct Manipulator Flight Demonstration and develop, operate and confirm the performance under microgravity of the robotic arm to be used for the *Japanese Experiment Module,* an attachment to the International Space Station, scheduled for completion in 2002. The Agency successfully synthesized a sythuim diamond in a microgravity experiment conducted aboard the space flier unit launched in March 1996. Japan's first lunar probe is expected to be launched around 2003 on a H-II rocket to collect data on the origin and evolution of the Moon, and developing the technology for soft landing on the Moon.

The *Italian* space agency is weighing a five-year plan to bring the agency out of debt and eliminate its budget deficit.

Vietnam is considering buying, launching and operating its own domestic communications satellite system.

B. FORTHCOMING EVENTS

The First *World Telemedicine* Symposium will be held near *Lisbon*, Portugal on *June 30 - July 4, 1997* and will deal with improvements of medical care for people living in rural and remote areas of developing countries.

SPS-97 will be held in *Montreal,* Canada, *August 24-28 1997* and will deal with space and electric power for humanity. It is organized by the Canadian Aeronautics and Space Institute and honorary sponsorship includes IAA, UN and UNESCO. Topics to be discussed include: energy problems, new technologies, technical and economic issues, space means for power utilities, energy delivery to commercial and other facilities in near earth space, wireless power transmission, solar power satellites, lunar power systems, long term perspectives, environmental, political, societal issues, legal and regulatory framework, international cooperation and forms of organization.+

Telecom Interactive 97 to be held at Palexpo, Geneva, Sept. 8-14, 1997, is to provide a unique overview of the convergence of telecommunications, computing and the infocommunications industries.

The 48th *International Astronautical Congress* will be held *Oct. 6-10, 1997 in Turin, Italy.* Its theme, "Developing Business From Space," will be explored through a series of symposia organized by the International Astronautical Federation, the International Academy of Astronautics and the International Institute of Space Law. The Congress expects to address critical and timely topics in the astronautics fields, including space technology, economic legal, political and environmental aspects of the world's programs for the peaceful utilization of space. Plenary sessions include: "Back to Mars", "space station utilization," "industry perspective", "earth science, including disaster warning," "space transportation and space communications." In the course of the Congress, the session of the Scientific-Legal Liaison Committee will be held jointly with the AIAA SETI Committee, on the subject of *"SETI and Society."*

The *1997 IISL Colloquium* will also take place during the same Congress on the theme *"Celebrating the 30th Anniversary of the Outer Space Treaty of 1967."* As reported previously, the following sessions are planned:

Session 1: Background and History of the Outer Space Treaty. (Invited papers only).
Chairmen: *N. Hosenball (USA)* and *A.A. Cocca (Argentina).*

Session 2: Concepts of space law and the Outer Space Treaty. (A session to explore the concepts of law contained in the Outer Space Treaty and the elaboration of those concepts as

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+ For further information contact Canadian Aeronautics and Space Institute. Tel 1-613-234-0191. Fax 1-613-234-9039. Email casi@casi.ca.

contained in the subsequent international treaties and agreements in space law).
Chairmen: *E. Galloway (USA)* and *G. Catalano Sgrosso (Italy).*

Session 3: Applications and Implementation of the Outer Space Treaty. (A session to explore the problems and realities of applying and implementing the Outer Space Treaty and the basic provisions of space law therein).
Chairmen: *S. Doyle (USA)* and *G. Lafferranderie (France).*

Session 4: The future applications of the Outer Space Treaty. (Examination of the Treaty from a 21st century perspective; should the Treaty be amended, supplemented or otherwise reinforced?).
Co-chairmen: *K.-H. Böckstiegel (Germany)* and *A. Terekhov (Russian Federation).*

Some of the possible topics considered for the *41th IISL Colloquium* to be held in *1998 in Australia* include: (a) Legal and policy aspects of confidence building measures using space technology; (b) The 30th anniversary of the Rescue Agreement; (c) Legal aspects of navigation satellites; (d) Legal aspects of sharing benefits from the conduct of space activities; and (e) Institutional approaches to managing space resources.

The *World Radiocommunication Conference* (Geneva, October 27-November 2, 1997) will address Kyoto Resolution 18 which refers in part, to international satellite network coordination.

Indonesia's first major telecommunication event *'Asia Pacific Telecom '97'* will take place Nov. 29 - Dec. 3, 1997 in Jakarta, Indonesia.

The *Third International Lunar Workshop* is expected to be convened in Moscow, Russia, in 1998.

BOOK REVIEWS/NOTICES

Reviews

RECENT TRENDS IN INTERNATIONAL SPACE LAW AND POLICY, edited by V.S. Mani, S. Bhatt & V.B. Reddy (Lancers Books 1997), pp. 683.

Many of this book's 39 essays, some of which are reprints of previously published articles, are written by Indian legal scholars. There aree, however, a number of eminent foreign contributors, including a foreword of Justice C.G. Weeramantry (ICJ). There is no single overall theme to the book, rather the papers tend to break down into five areas, in addition to an overview section of perspectives and a concluding section of views of the future by Professor S. Bhatt: (i) common heritage of mankind, (ii) space applications, (iii) liability, (iv) protection of the space environment, and (v) arms control, national security and space technology transfer.

In the first section presenting "perspectives", there are papers on "Space in Ancient India," authored by Professor V.S. Murty (who also writes an extensive overview of the entire book in a separate essay), and a paper containing extracts from a presidential address at the 1959 inaugural session of the Indian Society of International Law which shows that in 1959 certain legal concepts were predicted to be applicable to outer space. In other essays, Professor U.R. Rao explains how space technology, particularly remote sensing and communications are able to offer countries such as India enormous benefits, while Dr. T. Vijaya Chandra describes the various uses of outer space technology. Justice V. R. Krishna Iyer (Indian Supreme Court) reflects on space jurisprudence and calls for total demilitarization and de-nuclearization of outer space. Dr. N. Jasentuliyana describes "The Development of Space Law from a Third World Perspective" and Professor S. Bhatt portrays in one essay "The Role of Space Law in the Emerging New World Order," while in a separate piece, highlights the role played by various individuals in the creation of space law. Mr. V. B. Reddy examines the contribution of India to space law and policy and to the law-making processes, by reviewing India's views at UNISPACE conferences, COPUOS, and elsewhere.

The section on common heritage contains two essays. One is by Professor R.J. Rao who argues for a revised legal regime which would reconcile the inconsistencies and uncertainties between the Outer Space and Moon Treaties, with an international organization coordinating space activities, perhaps along the lines of what has transpired for the law of the sea. The other by Dr. G.S. Sachdeva examines the "supra-national" status conferred upon astronauts in treaty law and argues that this status was ill-conceived and its operational ramifications were unclear.

The section on space applications deals with remote sensing, satellite communications, intellectual property rights (IPR), and future air navigation systems (FANS)[1]. On the former topic, one article looks at the "Emerging Legal Rime of Remote Sensing: A General Survey". The other, written by three scientists, describes the problems of implementing some of the remote sensing principles contained in the 1986 General Assembly Resolution and the use of remote sensing data in courts in India. As to satellite communications, there are five essays, one of which pertains to ocean management.[2] Professor F. Lyall describes and evaluates the contribution of the ITU to space activities, while Dr. M.S. Sisodia describes the debates within COPUOS and the ITU in terms of the conflict of interests between developed and developing nations on DBS. Professor B.S. Murty, advocating free flow of information, examines the legal problems relating to DBS and Dr. J. Kumar describes a number of legal issues pertaining to the geostationary orbit, highlighting his view of the urgent need for delimitation of the air/outer space boundary. Professor C.Q. Christol analyzes the problems of protecting IPRs in outer space and urges the adoption of international agreements to ensure their protection.

The section on liability contains four papers. Dr. Diederiks-Verschoor describes practical problems faced by participants in space activities and notes that more countries will have to adopt national space legislation. Mr. I. Awford examines legal liability issues in commercial space activities. He surveys case-law and notes the need for careful contractual drafting, good insurance coverage, and the waiver of subrogation by the insurers of any party in the venture. Mr. V. Madhusoodhanan urges a clear definition of the term "damage" in the Liability Convention, expansion of the liability concept to cover the problem of debris, and clarification on financial liability for search and rescue. Dr. Iyer of INSAT discusses management of third party liability risks.

In the section on the space environment, Professor Rao urges a comprehensive Law of Space Convention providing, *inter alia,* for safeguards for the protection of the space environment. Mr. V.K. Ahuja, in one paper, also advocates a new convention and a new international organization, as well as the minimization of the production of debris, and in another paper, suggests a wide range of measures to tackle the problem of space debris. Mr. K.N. Ardhanareeswaran proposes a world wide debris action-plan, which includes promoting R&D work on containment of debris and contamination and an international agency.

Katherine M. Gorove
Vice-Chair, Ed. Bd., J. Space L.

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1 Articles on ICAO's FANS are written by Air Vice-Marshall H.M. Shahul, Professor S. Bhatt, Mr. B. Reddy and Mr. P.C.K. Ravindran.

2 Professor S.P. Jagota, expert on the Law of the Sea, discusses "Satellites and Ocean Management."

THE NEVER ENDING DISPUTE: DELIMITATION OF AIR SPACE AND OUTER SPACE by ROBERT F.A. GOEDHART (Ed. Frontieres 1996), pp. 181.

Mr. Goedhart's book provides a detailed description of the various theories that have been suggested to provide a basis for delimitation of air and outer space. It is refreshing to have Mr. Goedhart, who has both a legal and scientific background, to describe succinctly the scientific bases and shortcomings of a number of the delimitation theories.

For example, he examines whether atmospheric, biological, gravitational, rotational or aerodynamic conditions could be used as a basis for determining a boundary between air and outer space. He also describes and assesses a number of other theories, such as, allowing for sovereignty over a limitless airspace, taking a functional approach, using the lowest perigee of orbiting satellites to define the boundary of outer space, and the three zone theory, allowing for air space, outer space and an in-between zone (called a contiguous zone with subjacent states exercising certain sovereign rights[3] or mesospace, with no given sovereign rights[4]).

The author concludes that there are now three zones: outer space, air space and a transit zone in between. He sets forth an extensive analysis as to how it is now customary international law that the lowest perigee of orbiting satellites is part of outer space. Because of this, he argues that a treaty on a boundary situated at an altitude of 100 km perpendicular to the mean sea level should be concluded to provide certainty as to when outer space law applies. Unfortunately, Mr. Goedhart devotes too little emphasis and support for his over-all conclusions. For example, it would have been interesting had he addressed the implications of carrying out his recommendations, for example, what rules of the road he could have foreseen being developed in the transit regime.

It should be noted that his book went to press prior to the publication of answers to question 7 of the UN questionnaire which raised the issue of whether there are "precedents with respect to the passage of aerospace objects after re-entry into the Earth's atmosphere" and whether international customary law exists with respect to such passage. He, therefore, was unaware and could not factor into his discussion of spacecraft passage to outer space any specific instances of state practice, such as the United States' communication to the USSR a few hours before the overflight of the Space Shuttle Atlantis in March 1990[5] or of Germany's statement on the overflight of the Soviet "Buran" which overflew several countries for the purpose of touchdown in Baikonur.[6]

It is disappointing that although this book, what is said to the only English language book on delimitation, provides excellent referencing to

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3 J.C. Cooper, QUESTIONS FONDAMENTALES DU DROIT INTERSPACIAL 210-230 (1961).

4 *See, e.g.*, Jager and Reijnen, *Mesospace, The Region between Air Space and Outer Space*, 18 PROC. COLLOQ. L. OUTER SPACE 107-112 (1976).

5 U.N. Doc. A/AC.105/635/Add.1, at 4-5 (1996).

6 *Id.* at 10-11.

writings in space law and general international law, particularly those from the pre-85 period, it does not refer to any primary source materials of states' positions in the Legal and Scientific Subcommittees. It was also unfortunate that the copy of the book supplied to this reviewer was missing six pages in the section on customary international law.[7] Nonetheless, as many of the articles written in legal periodicals on this subject pertain to just one aspect of this subject or advocate only one theory, the book is a useful tool and reference for those scholars desiring a complete picture of all of the various theories which have been advocated for air and outer space delimitation and the scientific or legal shortcomings of each of them.

Katherine M. Gorove
Vice-Chair, Ed. Bd., J. Space L.

Notices

THE CASE FOR MARS IV: THE INTERNATIONAL EXPLORATION OF MARS - MISSION STRATEGY AND ARCHITECTURES; THE CASE FOR MARS IV: THE INTERNATIONAL EXPLORATION OF MARS - CONSIDERATIONS FOR SENDING HUMANS, edited by THOMAS R. MEYER (Am. Astronautical Soc'y Science and Tech. Ser., vols. 89 & 90, Univelt 1997), pp. 760 & pp. 476.

These two, soft-cover volumes contain a wealth of papers and abstracts which were presented during the height of the Bush Administration's Space Exploration Initiative at a Conference on June 4-8, 1990 in Boulder, Colorado, under the auspices of the American Astronautical Society. Underlying the rationale of Mars exploration were social, scientific, educational, economic and international elements worthy of serious study and analysis.

The title of the first volume "Mission Strategy and Architecture" was selected to refer to the "entire program and encompassed not only the technical plans and mission strategies, but also the broad policy goals and means, including a significant component for international cooperation." In line with this approach a prologue by former NASA Administrator and Chairman of the National Commission on Space, the late Thomas O. Paine, is followed by presentations on Making the International Case for Mars, Mission Strategy, and Technical Considerations for Getting to Mars. The wide spectrum of topics deals with space policy, international cooperation, international science objectives, philosophy, planning, architecture, infrastructure and engineering, robotic and precursor missions, transportation systems and spacecraft, and advanced propulsion.

The second volume, consisting largely of abstracts, addresses mostly technical and scientific issues organized under the broad categories of Considerations for Sending Humans, Living on Mars, and Social Perspectives.

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7 Pages 116-117, 120-121, and 124-125 are blank.

Some of the legal issues touched upon briefly include those relating to the industrialization of celestial bodies, the need for rules to govern the exploitation of asteroids, and the types of importation taxes that space products may be subject to. Will import and export laws apply to the raw materials or only to the final products of space manufacturing? What nation's employment laws will space manufacturing workers be subject to? What legal guidelines should be applicable to jurisdiction and control of multinational activities? Will space law develop into astro-law applicable to outer space and astro-law relating to celestial bodies? (v. 49, pp. 43-44) There can be little doubt that many of these issues will have to be considered and pondered by policy and decision makers in the legal field, at both national and international levels, in an attempt to keep abreast of scientific and technical developments leading to human exploration of Mars and eventually of other celestial bodies.

While the exploration of Mars is a vital topic worthy of a comprehensive, multidisciplinary analysis, it is unfortunate that, in today's world of the accelerated tempo of technological innovations, it took close to seven years to publish the results. It is hoped that future volumes will be published before some of the findings and assumptions can become invalid or outdated, or where more updated information is available in view of the passage of time.

INTERNATIONAL AVIATION AND OUTER SPACE LAW AND RELATIONS - REFLECTIONS ON FUTURE TRENDS by S. BHATT (Asian Institute of Transport Development, New Delhi 1996), pp. 175 with index.

Approximately one-half the book is devoted to air law and the other half to space law. Professor Bhatt offers reflections on the historical development of space law and regulation and successfully provides a short and easily red overview of the past and future of air and space law. He notes that that many issues of space law still need discussion and regulation, such as space transport, direct television broadcasting, remote sensing, copyright issues, and the environmental protection of space. He predicts that international cooperation will be of utmost importance to solve these multi-faceted problems and advocates the formation of an international space agency along the lines of ICAO. For space transport issues, he suggests that ICAO and COPUOS hold a world conference to draw up new concepts for liability, search and rescue and technical requirements.

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* Compiled and edited by Michael A. Gorove, Attorney at Law, Associate Editor, J. SPACE L.

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CURRENT DOCUMENTS

I

Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries *

The General Assembly,

Having considered the report of the Committee on the Peaceful Uses of Outer Space on the work of its thirty-ninth session 1/ and the text of the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, as approved by the Committee and annexed to its report, 2/

Bearing in mind the relevant provisions of the Charter of the United Nations,

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Adopted on 13 December 1996 as General Assembly resolution 51/122.

1/ Official Records of the General Assembly, Fifty-first Session, Supplement No. 20 (A/51/20).

2/ Ibid., annex IV.

Recalling notably the provisions 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, 3/

Recalling also its relevant resolutions relating to activities in outer space,

Bearing in mind the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, 4/ and of other international conferences relevant in this field,

Recognizing the growing scope and significance of international cooperation among States and between States and international organizations in the exploration and use of outer space for peaceful purposes,

Considering experiences gained in international cooperative ventures,

Convinced of the necessity and the significance of further strengthening international cooperation in order to reach broad and efficient collaboration in this field for the mutual benefit and in the interest of all parties involved,

Desirous of facilitating the application of the principle that the exploration and use of outer space, including the moon and other celestial bodies, shall be carried out for the benefit and in the interest of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind,

Adopts the Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries, set forth in the annex to the present resolution.

ANNEX

Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries

1. International cooperation in the exploration and use of outer space for peaceful purposes (hereafter "international cooperation") shall be conducted in accordance with the provisions of international law, including the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. 3/ It shall be carried out for the benefit and in the

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3/ Resolution 2222 (XXI), annex.

4/ See Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982 and corrigenda (A/CONF.101/10 and Corr.1 and 2).

interest of all States, irrespective of their degree of economic, social or scientific and technological development, and shall be the province of all mankind. Particular account should be taken of the needs of developing countries.

2. States are free to determine all aspects of their participation in international cooperation in the exploration and use of outer space on an equitable and mutually acceptable basis. Contractual terms in such cooperative ventures should be fair and reasonable and they should be in full compliance with the legitimate rights and interests of the parties concerned, as, for example, with intellectual property rights.

3. All States, particularly those with relevant space capabilities and with programmes for the exploration and use of outer space, should contribute to promoting and fostering international cooperation on an equitable and mutually acceptable basis. In this context, particular attention should be given to the benefit and the interests of developing countries and countries with incipient space programmes stemming from such international cooperation conducted with countries with more advanced space capabilities.

4. International cooperation should be conducted in the modes that are considered most effective and appropriate by the countries concerned, including, inter alia, governmental and non-governmental; commercial and non-commercial; global, multilateral, regional or bilateral; and international cooperation among countries in all levels of development.

5. International cooperation, while taking into particular account the needs of developing countries, should aim, inter alia, at the following goals, considering their need for technical assistance and rational and efficient allocation of financial and technical resources:

(a) Promoting the development of space science and technology and of its applications;

(b) Fostering the development of relevant and appropriate space capabilities in interested States;

(c) Facilitating the exchange of expertise and technology among States on a mutually acceptable basis.

6. National and international agencies, research institutions, organizations for development aid, and developed and developing countries alike should consider the appropriate use of space applications and the potential of international cooperation for reaching their development goals.

7. The Committee on the Peaceful Uses of Outer Space should be strengthened in its role, among others, as a forum for the exchange of information on national and international activities in the field of international cooperation in the exploration and use of outer space.

8. All States should be encouraged to contribute to the United Nations Programme on Space Applications and to other initiatives in the field of international cooperation in accordance with their space capabilities and their participation in the exploration and use of outer space.

II

International cooperation in the peaceful uses of outer space +

The General Assembly,

Recalling its resolution 50/27 of 6 December 1995,

Deeply convinced of the common interest of mankind in promoting the exploration and use of outer space for peaceful purposes and in continuing efforts to extend to all States the benefits derived therefrom, and also of the importance of international cooperation in this field, for which the United Nations should continue to provide a focal point,

Reaffirming the importance of international cooperation in developing the rule of law, including the relevant norms of space law and their important role in international cooperation for the exploration and use of outer space for peaceful purposes,

Stressing the importance of the widest possible adherence to international treaties that promote the peaceful uses of outer space,

Concerned about the possibility of an arms race in outer space,

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+ Adopted on 13 December 1996 as General Assembly resolution 51/123.

Recognizing that all States, in particular those with major space capabilities, should contribute actively to the goal of preventing an arms race in outer space as an essential condition for the promotion of international cooperation in the exploration and use of outer space for peaceful purposes,

Considering that space debris is an issue of concern to all nations,

Noting the progress achieved in the further development of peaceful space exploration and application as well as in various national and cooperative space projects, which contribute to international cooperation, and the importance of further international cooperation in this field,

Taking note of the report of the Secretary-General 1/ on the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, 2/

Having considered the report of the Committee on the Peaceful Uses of Outer Space on the work of its thirty-ninth session, 3/

1. Endorses the report of the Committee on the Peaceful Uses of Outer Space;

2. Invites States that have not yet become parties to the international treaties governing the uses of outer space 4/ to give consideration to ratifying or acceding to those treaties;

3. Notes that, at its thirty-fifth session, the Legal Subcommittee of the Committee on the Peaceful Uses of Outer Space, in its working groups, continued its work as mandated by the General Assembly in its resolution 50/27; 5/

1/ A/51/276.

2/ See Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982, and corrigenda (A/CONF.101/10 and Corr.1 and 2).

3/ Official Records of the General Assembly, Fifty-first Session, Supplement No. 20 (A/51/20).

4/ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (resolution 2222 (XXI), annex); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (resolution 2345 (XXII), annex); Convention on International Liability for Damage Caused by Space Objects (resolution 2777 (XXVI), annex); Convention on Registration of Objects Launched into Outer Space (resolution 3235 (XXIX), annex); Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (resolution 34/68, annex).

5/ See Official Records of the General Assembly, Fifty-first Session, Supplement No. 20 (A/51/20), sect. II.C.

4. Endorses the recommendations of the Committee that the Legal Subcommittee, at its thirty-sixth session, taking into account the concerns of all countries, particularly those of developing countries, should:

(a) Continue its consideration of the question of review and possible revision of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space; 6/

(b) Continue, through its working group, its consideration of 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;

5. Also endorses the recommendation of the Committee that the Legal Subcommittee, at its thirty-sixth session, should suspend consideration in its working group of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space pending the results of the work in the Scientific and Technical Subcommittee, without prejudice to the possibility of reconvening its working group on that item if in the opinion of the Legal Subcommittee sufficient progress was made in the Scientific and Technical Subcommittee at its session in 1997 to warrant the reconvening of the working group;

6. Notes that deliberations on the question of the geostationary orbit have been undertaken by the Legal Subcommittee as reflected in its report, 5/ on the basis of recent proposals which might provide a new and enhanced basis for future work;

7. Endorses the recommendations and agreements concerning the organization of work in the Legal Subcommittee;

8. Notes that the Chairman of the Legal Subcommittee, at its thirty-fifth session, conducted open-ended informal consultations with all members of the Subcommittee on the working methods of the Subcommittee, including the consideration of possible additional items for inclusion in its agenda, as outlined in the report of the Committee, 7/ and that the implementation of several recommendations made by the Subcommittee at its thirty-fourth session resulted in a general recognition of the improvements in the working methods of the Subcommittee at its thirty-fifth session;

9. Welcomes that, pursuant to its request in paragraph 12 of its resolution 50/27, the Legal Subcommittee reviewed its requirement for summary records and that, beginning with its thirty-sixth session, it would be provided with unedited verbatim transcripts in lieu of summary records;

6/ See resolution 47/68.

7/ See Official Records of the General Assembly, Fifty-first Session, Supplement No. 20 (A/51/20), sect. II.C.4.

10. Notes with satisfaction that, in accordance with paragraph 11 of its resolution 50/27, the Committee was provided, at its thirty-ninth session, with unedited verbatim transcripts of that session in lieu of verbatim records and that the Committee would evaluate the use of unedited verbatim transcripts at its fortieth session to inform the General Assembly at its fifty-second session of the experience of the Committee with the transcripts;

11. Also notes that, in accordance with paragraph 9 of its resolution 50/27, the Committee reconvened, at its thirty-ninth session, the Working Group of the Whole to examine the working methods of the Committee and its subsidiary bodies;

12. Endorses the recommendations of the Committee as contained in the report of its thirty-ninth session with regard to its working methods; 8/

13. Notes that, in accordance with the agreement of the Committee at its thirty-ninth session, the Chairman of the Committee had undertaken and will continue to hold, as necessary, inter-sessional informal consultations among the members of the Committee with a view to reaching consensus decisions before the fortieth session of the Committee on the modalities of establishing a new composition of bureaux, keeping in view the principles of equitable geographical representation and rotation, and that all proposals made by delegations and groups of delegations, including the need for agenda restructuring and an examination of session duration, were taken into account in the framework of those informal consultations;

14. Agrees that if consensus agreement is reached among the members of the Committee on measures relating to the working methods of the Committee and its subsidiary bodies, including the composition and election of the bureaux, duration of sessions of those bodies and inclusion of additional items in the agenda of the Legal Subcommittee, those measures should be implemented during the 1997 sessions of the Committee and its subsidiary bodies as the transitional arrangements for the year 1997;

15. Notes that the Scientific and Technical Subcommittee of the Committee on the Peaceful Uses of Outer Space, at its thirty-third session, continued its work as mandated by the General Assembly in its resolution 50/27; 9/

16. Notes with satisfaction that the Scientific and Technical Subcommittee continued to consider on a priority basis the agenda item on space debris and that the work of the Subcommittee at its thirty-third session had concentrated on the topic of measurements of space debris, understanding of data and effects of this environment on space systems, based on the multi-year work plan adopted by the Subcommittee at its thirty-second session; 10/

8/ Ibid., sect. II.E.3.

9/ Ibid., sect. II.B.

10/ A/AC.105/605, para. 83.

17. Agrees that the multi-year work plan for the consideration of the item on space debris should continue to be implemented with flexibility;

18. Also endorses the recommendations of the Committee that the Scientific and Technical Subcommittee, at its thirty-fourth session, taking into account the concerns of all countries, particularly those of developing countries, should:

(a) Consider the following items on a priority basis:

(i) United Nations Programme on Space Applications and the coordination of space activities within the United Nations system;

(ii) Implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space; 2/

(iii) Matters relating to remote sensing of the Earth by satellites, including, inter alia, applications for developing countries;

(iv) Use of nuclear power sources in outer space;

(v) Space debris;

(b) Consider the following items:

(i) Questions relating to space transportation systems and their implications for future activities in space;

(ii) Examination of the physical nature and technical attributes of the geostationary orbit and of its utilization and applications, including, inter alia, in the field of space communications, as well as other questions relating to space communications developments, taking particular account of the needs and interests of developing countries;

(iii) Matters relating to life sciences, including space medicine;

(iv) Progress in national and international space activities related to the Earth's environment, in particular progress in the international geosphere-biosphere (global change) programme;

(v) Matters relating to planetary exploration;

(vi) Matters relating to astronomy;

(vii) The theme fixed for special attention at the thirty-fourth session of the Scientific and Technical Subcommittee: "Space systems for direct broadcasting and global information systems for space research"; the Committee on Space Research and the International Astronautical Federation, in liaison with Member States, should be invited to arrange a symposium, with as wide a participation as possible, to be

held during the first week of the Subcommittee's session, to complement discussions within the Subcommittee on the special theme;

19. Considers, in the context of paragraph 18 (a) (ii) above, that it is particularly urgent to implement the following recommendations:

(a) All countries should have the opportunity to use the techniques resulting from medical studies in space;

(b) Databases at the national and regional levels should be strengthened and expanded and an international space information service should be established to function as a centre of coordination;

(c) The United Nations should support the creation of adequate training centres at the regional level, linked, whenever possible, to institutions implementing space programmes; necessary funding for the development of such centres should be made available through financial institutions;

(d) The United Nations should organize a fellowship programme through which selected graduates or postgraduates from developing countries should get in-depth, long-term exposure to space technology or applications; it is also desirable to encourage the availability of opportunities for such exposure on other bilateral or multilateral bases outside the United Nations system;

20. Endorses the recommendations of the Working Group of the Whole of the Scientific and Technical Subcommittee, as endorsed by the Committee and as contained in the report of the Working Group of the Whole; 11/

21. Also endorses the recommendation of the Committee that the Scientific and Technical Subcommittee should reconvene, at its thirty-fourth session, the Working Group of the Whole to Evaluate the Implementation of the Recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, to continue its work;

22. Invites Member States to report to the Secretary-General on a regular basis with regard to national and international research concerning the safety of space objects with nuclear power sources on board;

23. Endorses the United Nations Programme on Space Applications for 1997, as proposed to the Committee by the Expert on Space Applications; 12/

24. Emphasizes the urgency and importance of implementing fully the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, in particular those relating to the promotion of the establishment and strengthening of regional mechanisms of cooperation through the United Nations system;

11/ A/AC.105/637, annex II.

12/ A/AC.105/625, sect. I.

25. Invites all Governments within the organizations of the United Nations system and other intergovernmental organizations working in the field of outer space or on space-related matters to take effective action for the implementation of the recommendations of the Conference, and also invites the Secretary-General to report to the General Assembly at its fifty-second session on the implementation of the recommendations of the Conference;

26. Notes with satisfaction that, in accordance with paragraph 30 of resolution 50/27 and in the context of paragraph 19 (c) above, the Centre for Space Science and Technology Education in Asia and the Pacific had begun its first education programme in April 1996 and that significant progress has also been achieved in establishing regional centres for space science and technology education in the other regions covered by the regional commissions;

27. Notes that, pursuant to its recommendation in paragraph 33 of resolution 50/27, the Scientific and Technical Subcommittee, at its thirty-third session, continued to discuss the possibility of holding a third United Nations Conference on the Exploration and Peaceful Uses of Outer Space before the turn of the present century, and that the Committee continued these discussions at its thirty-ninth session with a view to making a final recommendation to the General Assembly at its fifty-first session;

28. Endorses the recommendation of the Committee that a special session of the Committee, open to all Member States of the United Nations (UNISPACE III), should be convened at the United Nations Office at Vienna, preferably in 1999, unless progress towards agreeing on an agenda at the Scientific and Technical Subcommittee at its thirty-fourth session makes it more appropriate to consider the year 2000; 13/

29. Requests the Committee and the Scientific and Technical Subcommittee to act as the Preparatory Committee and Advisory Committee and the Office for Outer Space Affairs to act as the executive secretariat for UNISPACE III; and also requests the Preparatory Committee and the Advisory Committee to carry out the tasks entrusted to them in paragraphs 178 to 185 of the report of the Committee 14/ and to report to the General Assembly at its fifty-second session on the progress made in the preparatory work for UNISPACE III;

30. Recognizes the contribution of the Third Space Conference of the Americas, held at Punta del Este, Uruguay in 1996, towards promoting regional cooperation in space activities, as well as the meetings mentioned in paragraph 13 of the report of the Secretary-General on the implementation of the recommendations of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, 15/ and calls upon the regional commissions to support those initiatives;

13/ See Official Records of the General Assembly, Fifty-first Session, Supplement No. 20 (A/51/20), sect. II.E.

14/ Ibid.

15/ A/51/276.

31. Recommends that more attention be paid to all aspects related to the protection and the preservation of the outer space environment, especially those potentially affecting the Earth's environment;

32. Considers that it is essential that Member States pay more attention to the problem of collisions of space objects, including those with nuclear power sources, with space debris, and other aspects of space debris, calls for the continuation of national research on this question, for the development of improved technology for the monitoring of space debris and for the compilation and dissemination of data on space debris, and also considers that, to the extent possible, information thereon should be provided to the Scientific and Technical Subcommittee;

33. Urges all States, in particular those with major space capabilities, to contribute actively to the goal of preventing an arms race in outer space as an essential condition for the promotion of international cooperation in the exploration and uses of outer space for peaceful purposes;

34. Emphasizes the need to increase the benefits of space technology and its applications and to contribute to an orderly growth of space activities favourable to sustained economic growth and sustainable development in all countries, particularly in the developing countries;

35. Requests the Committee to continue to consider, as a matter of priority, ways and means of maintaining outer space for peaceful purposes, taking into account the views expressed at its thirty-ninth session and at the fifty-first session of the General Assembly, and to report thereon to the Assembly at its fifty-second session;

36. Also requests the Committee to continue to consider at its fortieth session its agenda item entitled "Spin-off benefits of space technology: review of current status";

37. Endorses the decision of the Committee to grant permanent observer status to The Planetary Society;

38. Requests the specialized agencies and other international organizations to continue and, where appropriate, enhance their cooperation with the Committee and to provide it with progress reports on their work relating to the peaceful uses of outer space;

39. Requests the Committee to continue its work, in accordance with the present resolution, to consider, as appropriate, new projects in outer space activities, and to submit a report to the General Assembly at its fifty-second session, including its views on which subjects should be studied in the future.

III

DECLARATION OF PUNTA DEL ESTE

ADOPTED BY THE THIRD CONFERENCE OF THE AMERICAS

PUNTA DEL ESTE, NOV. 4-8, 1996

THE THIRD CONFERENCE OF THE AMERICAS:

1.- Emphasizes the importance of the Conference as a forum which indicates the interest of all participating countries in promoting cooperation in the area of space activities and reaffirms the commitment of the States of the American region to the exploration and peaceful uses of outer space.

2.- Reiterates and stresses the importance of continuing progress in the elaboration of norms that contribute to the development of international space law.

To that it hopes that the U.N. General Assembly can make progress in adopting the Declaration of Principles on International Cooperation on space matters, adopted by consensus in the 1996 meeting of the Committee on the Peaceful Uses of Outer Space (COPUOS).

3.- Affirms that to create relevant space capabilities in the countries of the region, long-term continuity, coordination and stability are required in national space programs as well as appropriate technology (transfer) so as to allow future projects to be developed.

4.- Reaffirms the importance of international cooperation in space matters in an increasingly interdependent world, encouraging relevant International Agencies and Organizations to further strengthen their participation in support of space activities in the region.

5.- Urges national programs, governmental agencies and international organizations to support and promote the work of scientific and academic groups participating in space projects and activities in the region.

6.- Firmly believes that cooperative projects in space matters would serve to develop and foster applications of space technology in the region, in the widest and most effective way.

7.- Requests the U.N. System through the United Nations Office for Outer Space Affairs and the United Development Program, among others, to continue supporting the follow-up of the recommendations of the Conference.

8.- Further requests the Secretary General of the United Nations to provide the Economic Commission for Latin America and the Caribbean (ECLAC) with the necessary means and resources to carry out follow-up of the recommendations of the Conference. To that end, it requests that ECLAC include the actions developed in this matter in its Annual Report to the U.N. General Assembly.

9.- Welcomes with satisfaction the recommendation of COPUOS at its 1996 Session to hold a global meeting on space matters, UNISPACE III in 1999.

Accordingly, expresses its interest that the Agenda of UNISPACE III pay due regard to the links between the use of space technology and sustainable development, environment and education.

10.- Decides to continue holding the Space Conferences of the Americas, which should be convened in the region every 3 years. In this period, the role of the pro-tempore secretariat, whose headquarters is the host country of the last Conference, should be to carry out the follow-up of the results of the Conference, and provide its support to space cooperation in the region for which purpose it may have the assistance of an International Support Group.

11.- Further decides to adopt an Action Plan for Regional Space Cooperation in order to provide the necessary political, technical and institutional framework for its implementation.

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Stephen Gorove, a holder of fellowships from Harvard, Oxford and Yale, received his J.S.D. and Ph.D. degrees from Yale. Prior to joining the Law Faculty of the University of Mississippi in 1965 as Chairman of the Graduate Law Program and Professor of Law, he taught as Professor of Law in Colorado, Ohio and New York. He is the author many books and over 200 articles. His books include: SPACE LAW: ITS CHALLENGES AND PROSPECTS (1977); THE SPACE SHUTTLE AND THE LAW (1980); THE TEACHING OF SPACE LAW AROUND THE WORLD (1986); DEVELOPMENTS IN SPACE LAW: ISSUES AND POLICIES (1991); UNITED STATES SPACE LAW - NATIONAL AND INTERNATIONAL REGULATION (1982-1996). He is a member of the International Academy of Astronautics and a representative of the International Astronautical Federation before the U.N. Committee on the Peaceful Uses of Outer Space. He serves as Chairman of the Editorial Board of the JOURNAL OF SPACE LAW

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