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out of man's activities in outer space

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SPACE INDUSTRIALIZATION: SOME LEGAL AND POLICY CONSIDERATIONS FOR PRIVATE ENTERPRISE

*Don Fuqua**

Introduction

In little more than twenty years mankind has experienced unprecedented transition from the confines of earth to the unlimited opportunities offered by routine access to surrounding space. With the launching of the Space Shuttle a new era will be initiated in the saga of space. The reusable Space Shuttle is being developed by the National Aeronautics and Space Administration to deliver payloads to earth orbit more economically than is possible with existing expendable launch vehicles. The addition of the manned laboratory, Spacelab, under development by the European Space Agency, as well as other elements of the new space transportation system, will provide still further capabilities. Engineers, technicians and scientists will be able to remain in space for extended periods of time with substantial operational and mission flexibility and return to earth with the products of their efforts or leave in space, to be revisited as necessary, facilities of continuing usefulness.

During the short period of mankind's efforts in space, considerable change has been occurring in the objectives and in the content of space programs of the United States as well as those of other nations. Exploration for basic human knowledge, technical challenge, and national prestige were the major thrusts and rewards, and dictated a dominant role for government. Application programs derived from scientific and technical advances are adding new dimensions to space activities and are now offering new and fascinating uses of space for direct benefit on earth. Currently, space systems for communications, weather forecasting and earth resources monitoring and detection are providing early evidence of services available from space. Experiments on Apollo and Skylab manned space missions have demonstrated new materials and materials processing capabilities not available on earth, which hold great promise for use in making products with new and unique characteristics.

Role of the Private Sector

The National Aeronautics and Space Act of 1958,¹ mandating that "activities in space should be devoted to peaceful purposes for the benefit of all mankind"² galvanized the national effort in space. Carried out under the aegis of the National Aeronautics and Space Administration, the private sector of the country provided the necessary technical support and industrial capabilities to serve the government

*Chairman, Committee on Science and Technology, U.S. House of Representatives.

¹42 USC 2451 (1958).

²42 USC 2451(a) (1958).

customer. The cooperation of the public and private sectors provided maximum coordination in expanding research and development capabilities to accomplish the goals of the national space program.

The prospects for commercial uses of space for goods and services, however, will provide a new and greater role for the private sector. While NASA responsibilities in government sponsored programs will continue to advance national efforts in space exploration as well as in developing necessary operational capabilities for future requirements, opportunities for broader participation of the private sector are apparent. Activities can be initiated with objectives that are quite separate and independent from those which are directed by NASA and other government agencies.

Characteristics of the space environment such as global viewing, worldwide transmission of information, microgravity, vacuum and abundant solar energy are available for all to use as human intellect and imagination determine. Many of the concepts being investigated by NASA as well as industry which were presented to the Subcommittee on Space Science and Applications during hearings indicate that present uses of space in many respects can be considered quite rudimentary.³

Prospects for further improvements in present services as well as energy production, manufacturing, and industries which in all probability have not even been contemplated yet will move the United States as well as other nations to expanded uses of the space environment that will reap countless economic and societal benefits. We are on the threshold of industrializing space and the role of private enterprise will determine the success of these endeavors.

National Interests in Commercialization

Private enterprise interest in space will center around goods and services for use on earth which can be produced either uniquely in space or better in space than on earth. Private sector innovation and creativity in product development and services as well as understanding of marketplace needs dictate the importance of participation from broad and diverse industries and businesses. Greater potential for making the benefits of space available to all peoples of the world can best be realized with the active participation of the private sector. From the viewpoint of the United States, industries, businesses and individuals are where the nation must look for economic strength and this will be no less true in exploiting space and establishing national capabilities in space industrialization.

The importance of private enterprise in the industrialization process will challenge the nation's ability to accommodate the requirements of the free enterprise system in

³U. S. Congress, House Committee on Science and Technology. Space Industrialization, Hearings Before the Subcommittee on Space Science and Applications, September 29, 1977, 95th Cong., 1st Sess., at 204 (1977).

the national economic interest. In testimony before the Committee on Science and Technology, the Comptroller General of the United States gave some provoking advice. Elmer Staats advised that:

"One of the important areas for the Committee's consideration is how we can maximize private sector research and development which has concentrated in recent years on low-risk, short-term projects directed principally at improving existing products. Emphasis on long-term projects that could lead to new products and processes has decreased. For example, industry now spends only 25 percent of its research and development expenditures on long-term research, down from 36 percent in 1957."⁴

On the other hand, high technology contributes substantially to our competitiveness in the international marketplace. The high-technology manufacturing industries in 1976 showed a favorable trade balance of \$28 billion while other manufacturing industries showed a net deficit of \$16 billion. Recent trends, however, suggest a leveling or even a weakening in high-technology contributions to the trade balance.⁵

Within the foreseeable future the costs of research, development and operations in space will remain relatively high. But the importance of involving the private sector early in space activities and with determination to make substantial strides will require major efforts in investigating appropriate institutional, financial and legal frameworks. With business activity must go a business climate where the private sector understands the rules and feels comfortable with their prospects for commercial success. American industries will be competing in the world marketplace where governmental policies and relationships with industry can vary substantially. During hearings of the House Subcommittee on Space Science and Applications, Sherwood Fawcett in describing overseas activities of Battelle Memorial Institute testified that:

"In most advanced technical countries, industry and government are so closely related that it is sometimes difficult to distinguish between them."⁶

In the past, the American system of free enterprise has provided unparalleled national growth. In looking to private industrial participation in space, we cannot ignore the realities of present world and national economics. However, the apparent dichotomy of differing criteria in the United States for governmental and private sector expenditures need not preclude serving common interests but could contribute to less

⁴U. S. Congress, House Committee on Science and Technology, Hearings on The Federal R & D Budget, April 5, 1979, 96th Cong., 1st Sess. at 227 (1979).

⁵United States Foreign Trade Annual, August 1979. OBA 79-22, Table 5 at 10-11, Table 6 at 14-15, published by the Office of International Economic Research of the U. S. Dept. of Commerce.

⁶Space Industrialization Act of 1979, Hearings Before the Subcommittee on Space Science and Applications, May 22, 23 and June 26, 27, 1979. (In print).

than full utilization of national resources and capabilities. Within the American tradition of free enterprise with minimum governmental interference, new approaches to high technology stimulation need to be thoroughly explored and evaluated.

Space Industrialization Corporation

One bold and innovative approach to addressing the needs of the private sector in advancing national capabilities in space is embodied in proposed legislation, H. R. 2337.⁷ The objective of this bill is to provide investment capital and establish the necessary business conditions to attract industries which can use the space environment to manufacture products and provide services.⁸ The target industries are those which supply the goods and services to the private sector and not just the industries which provide aerospace equipment and systems to serve governmental purposes.⁹

The approach employed in H. R. 2337 is to provide a sufficient degree of flexibility to balance the interests of the nation and those of private enterprise in promoting aggressive and worthwhile space ventures. National interests would be served by ensuring that projects of the highest quality which advance the technology base of the nation and provide useful goods and services for domestic and world markets would be produced.¹⁰ Private sector interests and objectives would be served by providing a source of investment capital which is committed to high-technology projects having significant prospect for commercial success but which otherwise can exceed acceptable risk to private shareholder investments.¹¹

The mechanism of federal support seems particularly appropriate to space industrialization which has been nurtured from programs which have been essentially the exclusive domain of government. The complexity of technology and uncertainty in outcome were the obvious reasons for the national effort in opening up access to space and also provided impetus for a continued role of government in ensuring that the private sector can fully avail itself of new opportunities. Although earth orbit is shorter in distance than Washington, D.C., is from New York City, the private sector may well view this as an impenetrable abyss in the process from conceptualization to commercialization.

⁷H. R. 2337, 96 Cong., 1st Sess., A Bill to Establish A Space Industrialization Corporation to Promote, Encourage and Assist in the Development of New Products, Processes, and Industries Using the Properties of the Space Environment. H. R. 2337 is essentially the same as H. R. 14297, 95 Cong., 2d Sess.

⁸*Id.*, §2(c).

⁹*Id.*, §102(a).

¹⁰*Id.*, §2(c) and (d).

¹¹*Id.*, §102(9).

The major purpose of the legislation is to provide capital through direct equity investments, loans and loan guarantees. A trust fund would be established¹² and initially funded through federal appropriations.¹³ The Secretary of the Treasury would administer the fund and the Space Industrialization Corporation would provide the institutional connection between the trust fund and private enterprise.¹⁴ The Space Industrialization Corporation would conduct its operations in a manner familiar to the private sector and accordingly enter into arrangements with sound business basis.¹⁵ The provisions of the bill recognize differences in business arrangements when private enterprise undertakes research and development for the competitive market as opposed to producing goods and services for government agencies. Typical contractor relationship with the government customer can often involve conditions which inhibit private enterprise commitments. In such cases, Government establishes the needs and specifies requirements, controls the funding and termination provisions and owns the property rights ensuing from the contract. The Space Industrialization Corporation in dealing with the private sector, on the other hand, would recognize commercial practices and make financial arrangements consistent with these needs while still protecting the interests of the taxpayer.

The Space Industrialization Corporation is essentially an investment bank having equity interests in space ventures. The Corporation is subject to the Government Corporation Control Act¹⁶ to bring its activities under annual scrutiny by the Congress while providing operational flexibility to conduct a primarily business function as opposed to a governmental function. Several provisions of the bill are directed toward establishing a business-like relationship which would provide a high degree of assurance that a private entity could depend upon the continuity of obligated funds,¹⁷ the commitment to management and financial plans,¹⁸ security in handling competitive information,¹⁹ private ownership of patent²⁰ and proprietary data²¹ and the ultimate sharing in the benefits of the business venture.

¹²*Id.*, §103(a).

¹³*Id.*, §103(b).

¹⁴*Id.*, §103(a).

¹⁵*Id.*, §102(d) and 101(f).

¹⁶31 USC 856 (1945).

¹⁷H. R. 14297, 95th Cong., 2d Sess., §102(d)(3) and (f).

¹⁸*Id.*, §102(f).

¹⁹*Id.*, §102(l).

²⁰*Id.*, §102(i).

²¹*Id.*, §102(i).

The extent to which Congress should accommodate these needs of private enterprise in promoting entry to space industrialization will require further consideration. Specifically, the Budget and Impoundment Control Act²² exemptions on spending authority limitation would apply to the Corporation. The Freedom of Information Act²³ exemption for protection of commercial and proprietary information would be delineated as it applies to management and financial agreements to encourage high quality disclosures.²⁴ In addition, agreements entered into by the Space Industrialization Corporation can provide for full private ownership of intellectual property rights and subject all parties to performing the obligations contracted for.²⁵

Since the objectives include both national purpose and business purpose, profitability is an important consideration in measuring the success of the Space Industrialization Corporation investments. Projects which are commercially successful would provide the cash flows necessary to reimburse the trust fund and form the basis for viable on-going operations.²⁶ The goal is that eventually federal appropriations would be returned to the U. S. Treasury²⁷ and a stockholder owned capital enterprise venture could be sustained to provide the source of private funds for infusion in space industrialization.²⁸ Less than ideal conditions may possibly result, however, and net profitability may never be achieved. In any event, national interests would still have been served if, on balance, the private sector had brought its efforts to bear in seeking opportunities for industrializing space. Commercially unsuccessful projects, although failures in a financial sense, could provide invaluable technical information for future projects.²⁹

Summary

This article addresses a concept for financing private ventures which can have major effects on expanding uses of space for the benefit of the United States as well as for the benefit of all mankind. Questions of legal and policy significance are contained in

²²21 USC 1301 (1974).

²³5 USC 552(b) (4) (1964).

²⁴H. R. 14297, 95th Cong., 20 Sess., §102(l) (1978).

²⁵*Id.*, §102(i).

²⁶*Id.*, §102(f).

²⁷31 USC 856 (1978), as amended by H. R. 14297 §106(a),
31 USC 867 (1978), as amended by H. R. 14297 §106(b),
31 USC 868 (1978), as amended by H. R. 14297 §106(c).

²⁸H. R. 14297, 95th Cong., 2d Sess., §101(d).

²⁹*Id.*, §102(g).

formative legislation to provide federal initiative for stimulating private sector innovation in order to enhance national capabilities in space. The programs of the National Aeronautics and Space Administration will continue the vital role of space exploration and technological development. The basic premise is that effective commercial applications require the commitment of private enterprise. These concepts as embodied by the legislation deserve consideration and discussion by thoughtful persons to define the proper role for government in addressing the risk and capital factors of future space activities.

Our experience in space exploration is just two decades old. The pace has been fast to be sure and the cement is still being poured. We know the ways in which space science has already expanded our horizon and we can only guess as to what the future will hold. The musings of men's minds are all interlocked and a single spark of light in one area can provide illumination to a vast succession of unforeseen connections to others.

What we know will lead us to the unknowns. What we discover there will bring us to the heretofore unimagined. This has been the history of civilization. Space industrialization is a stepping stone along this way—one on which we will balance for a while, gain a new perspective and continue on.

THE CURRENT SITUATION IN THE FIELD OF
MARITIME COMMUNICATION SATELLITES:
"INMARSAT" +

H.H.M. Sondaal*

I. Introduction

Technological developments in the field of telecommunications have led to a rapid and considerable improvement of telecommunications services ashore. These technological developments have, however, left unchanged the traditional maritime communications system which has serious shortcomings.

The average delay in communications traffic is about six hours, but longer delays are no exception. Voice quality is often poor and radio blackouts, interference and fading limit the effective radio time and reduce traffic efficiency. This is a surprising situation, considering that shipping is a capital-intensive industry and the world's merchant shipping fleet at present comprises approximately 10,036 ships of 10,000 tons gross tonnage or more and approximately 26,656 ships between 500 and 10,000 tons gross tonnage.¹

Maritime satellites can do away with the shortcomings of the conventional maritime communications system by providing a means for transmissions which are not affected by the propagation conditions. The importance of a maritime satellite system was recognized early, particularly by the International Maritime Consultative Organization (IMCO), a specialized agency of the United Nations. In 1966 the Organization decided to study the operational requirements for a satellite communications system. It was felt that such a system

could contribute to safety by providing reliable means for alerting vessels in cases of distress and emergency, improving means for position reporting for search and rescue purposes, expanding transmission of weather information, facilitating the operation of shipping lanes and the separation of traffic at sea.²

+ This article is an elaboration of the author's presentation at the 30th Congress of the International Astronautical Federation, in September 1979, in Munich, Fed. Rep. of Germany.

*Director of Treaties, Ministry of Foreign Affairs, The Hague, Netherlands. Mr. Sondaal was chairman of the INMARSAT Preparatory Committee. This article represents his personal views.

¹Lloyd's Register of Shipping, statistical tables, 1979, table 5.

²See Report of the Second Session of the IMCO Subcommittee on Safety of Navigation, Doc. NAV 2/14, p. 6, para. 30 (April 17, 1967). See also: Report of Sixth Session of the IMCO Subcommittee on Radio Communication, Doc. COM 6/10 (Jan. 19, 1970).

The 1967 World Administrative Radio Conference invited IMCO to

continue to study the requirements and other considerations where benefit may accrue to the safety and navigation of ships at sea through application of space communication techniques.³

At about the same time the International Radio Consultative Committee of the International Telecommunication Union started to study the use of satellite techniques for maritime communications and the Scientific and Technical Sub-Committee on the Peaceful Uses of Outer Space of the United Nations started to discuss the question of a navigation satellite system for position determination.⁴ In 1971 the World Administrative Radio Conference for Space Telecommunications allocated frequencies to the maritime mobile-satellite service.⁵

In March 1972 IMCO established a Panel of Experts which was given the following terms of reference:

- a) study of the operational requirements of a maritime mobile satellite system;
- b) study of the essential characteristics of a maritime mobile satellite system;
- c) study of critical system elements, for example ship terminal;
- d) cost/benefit and marketing studies leading to a cost evaluation;
- e) consider and make recommendations for a programme of experiments and development work that may be necessary;
- f) consider the appropriate body or bodies which might be interested in financing, establishing and operating the system;
- g) prepare a report for the proposed International Conference in 1975.⁶

The Panel, which met six times during the period 3 July 1972 to 6 September 1974, identified the following reasons for establishing a maritime satellite system:

1. deficiencies of the present HF system:
 - a. conventional techniques will be unable to fulfill the increasing demands in the future;
 - b. acute congestion and saturation of existing HF facilities is to be expected by 1980;

³Recommendation No. Mar. 3, Partial Revision of the Additional Radio Regulations (November 3, 1967).

⁴Following Recommendation No. Mar. 3 of the Partial Revision of the Additional Radio Regulations, November 3, 1967. *See also*: U.N.G.A. Res. 2223 XXI of Dec. 19, 1966.

⁵*See* Annex 3 to the Partial Revision of the Radio Regulations, (July 17, 1971.)

⁶*See* IMCO Doc. MARSAT/CONF/3 Presentation on the Establishment of a Maritime Satellite System; Report of the Panel of Experts, at 1-2 (October 30, 1974).

- c. an average delay of 5 to 6 hours;
- d. poor quality;
- e. insufficient geographical coverage;
2. the inability to expand the existing system in a way commensurate with the needs for accomodating certain facilities to shipping;
3. limited prospects for improving the existing system.⁷

The Panel advanced the following reasons in favor of the establishment of a maritime satellite system as soon as possible:

- a) to relieve present congestion in the MF and HF bands;
- b) to improve reliability, quality and speed of communication;
- c) to improve geographical coverage and continuous availability of services;
- d) to provide more reliable circuits and permit automation of radiotelephone and teleprinter;
- e) to cater for services not possible at present in the MF and HF bands, *e.g.* high speed data transmission;
- f) to provide for radiodetermination; and
- g) to improve distress, urgency and safety communications.⁸

While the Panel of Experts was still considering the need to establish an international maritime satellite system the IMCO Assembly resolved on 23 November 1973 to convene an International Conference of Governments to "decide on the principle of setting up an international maritime satellite system."⁹ Pursuant to this Resolution IMCO convened the International Conference on the Establishment of an International Maritime Satellite System which held three sessions from 23 April 1975 to 9 May 1975, from 9 to 27 February 1976 and from 1 to 3 September 1976. On 3 September 1976 the Conference adopted the Convention on the International Maritime Satellite Organization (INMARSAT) (hereinafter referred to as: "The Convention") and the Operating Agreement on the International Maritime Satellite Organization (INMARSAT) (hereinafter referred to as: "The Operating Agreement").¹⁰ The Convention and the Operating Agreement entered into force on 16 July 1979, 49 days before the deadline set in Article 33 (2) of the Convention.¹¹ Parties to the Convention

⁷*Id.*, at 3-5.

⁸*Id.*, at 6.

⁹IMCO Res. A. 305 (VIII) of November 23, 1973.

¹⁰For texts, see 15 Int'l Legal Mat. 1051 *et seq.* (1976)

¹¹See IMCO Circular Letter 667 (July 23, 1979).

and Signatories to the Operating Agreement on the date of entry into force were the following States and telecommunications entities of those States:

—Algeria	—Japan
—Australia	—Kuwait
—Belgium	—Netherlands
—Brazil	—New Zealand
—Bulgaria	—Norway
—Canada	—Poland
—China, People's Republic of	—Portugal
—Denmark	—Singapore
—Egypt	—Spain
—Finland	—Sweden
—Greece	—United Kingdom
—India	—USSR, Byelorussian
—Italy	—SSR and Ukrainian SSR
	—United States ¹²

II. INMARSAT

The INMARSAT Organization is based on two instruments of public international law: a Convention between participating States (called: "Parties") and an Operating Agreement between States or entities, public or private, designated by a State (called: "Signatories").¹³

Where a Signatory is an entity designated by a Party, that Party is not liable for obligations arising under the Operating Agreement. This is to say that the State does not bear any responsibility for financial, technical and operational matters. However, the State is required to give guidance and instructions to ensure that the Signatory fulfills its responsibilities.¹⁴ Withdrawal of a Party from the Convention entails the simultaneous withdrawal of any Signatory designated.¹⁵ If a Signatory withdraws, the Party which designated it, shall designate a new Signatory, assume itself the capacity of Signatory or withdraw.¹⁶ It is assumed that by entities, public or private, that may be designated, are meant telecommunications administrations or entities.¹⁷

¹²See Column 13 of list reproduced in IMCO Circular Letter 665 (August 24, 1979).

¹³Convention INMARSAT, Art. 1 and Art. 2(3).

¹⁴*Id.*, Art. 4 (b) and (c).

¹⁵*Id.*, Art. 29 (1).

¹⁶*Id.*, Art. 30 (6).

¹⁷*Id.*, Art. 2 (4).

The purpose of INMARSAT is

to make provision for the space segment necessary for improving maritime communications, thereby assisting in improving distress and safety of life at sea communications, efficiency and management of ships, maritime public correspondence services and radiodetermination capabilities.¹⁸

INMARSAT shall seek to serve all areas where there is need for maritime communications¹⁹ and shall act exclusively for peaceful purposes.²⁰ In achieving this purpose INMARSAT shall take into account the following basic principles which are either stated specifically in the Convention or Operating Agreement or follow indirectly from these two instruments.

INMARSAT may own or lease the space segment²¹. The space segment shall be open for use by ships of all nations on conditions to be determined by the Organization. In determining those conditions the Organization may not discriminate among ships on the basis of nationality.²² Earth stations on structures at sea other than ships may be permitted access to the space segment on a case-by-case basis.²³ The Organization should provide the space segment in the most economic, effective and efficient manner. In so doing, it needs to take account of

- the telecommunications requirements,
- the policies, plans, programmes, procedures and measures for the design, development, construction, establishment, acquisition by purchase or lease, operation, maintenance and utilization of the space segment, and
- the criteria and procedures for approval and control of performance of earth stations, as determined by the Council.²⁴

INMARSAT shall operate on a sound economic and financial basis having regard to accepted commercial principles.²⁵ It is financed by contributions of the Signatories

¹⁸*Id.*, Art. 3 (1).

¹⁹*Id.*, Art. 3 (2).

²⁰*Id.*, Art. 3 (3).

²¹*Id.*, Art. 6.

²²*Id.*, Art. 7 (1).

²³*Id.*, Art. 7 (2).

²⁴*Id.*, Art. 15 (a), (b), (c).

²⁵*Id.*, Art. 5 (3).

which in turn receive capital repayment and compensation for use of capital when revenues so allow.²⁶ Capital contributions, capital repayment and compensation for use of capital are made in proportion to the investment share of a Signatory.²⁷ An investment share is determined on the basis of utilization of the space segment; in so doing, utilization in both directions shall be divided into two equal parts, a ship part and a land part.²⁸ INMARSAT derives income by making charges for the utilization of the space segment. The objective of these charges is to earn sufficient revenues to cover the operating, maintenance and administrative costs, the provision of any operating funds, and the repayment and compensation for use of capital contributed by Signatories.²⁹

As was said earlier, the Organization may not, in respect of access to the space segment, discriminate among ships on the basis of nationality. However, the Organization may establish higher utilization charges for entities other than Signatories which are authorized to utilize the space segment.³⁰

The procurement policy of INMARSAT should encourage world-wide competition in the supply of goods and services. To this end the Organization shall award contracts, based on responses to open international invitations to tender, to bidders offering the best combination of quality, price and delivery time.³¹

INMARSAT has three principal organs:³² the Assembly, the Council and the Directorate. The Assembly is composed of all the Parties, each of which has one vote.³³ The functions of the Assembly are mainly of an advisory nature. It considers the general policy and long-term objectives of the Organization and expresses views and makes recommendations thereon to the Council. Its decision-making powers are limited to some administrative and institutional matters.³⁴ The Assembly takes decisions on matters of substance by a two-thirds majority and on procedural matters by a simple majority, of the Parties present and voting.³⁵

²⁶*Id.*, Art. 5 (2).

²⁷INMARSAT, Operating Agreement, Art. III (1).

²⁸*Id.*, Art. V (1), (2).

²⁹*Id.*, Art. VIII (1) and Convention on INMARSAT, Art. 19 (1).

³⁰*Supra* note 13, Art. 19 (3).

³¹*Id.*, Art. 20.

³²*Id.*, Art. 9.

³³*Id.*, Art. 10 (1), 11 (1).

³⁴*Id.*, Art. 12.

³⁵*Id.*, Art. 11 (2).

The Council consists of 22 representatives: eighteen from the Signatories or groups of Signatories with the largest investment shares in the Organization and four elected by the Assembly in order to ensure that the principle of just geographical representation is taken into account.³⁶ The Council exercises the real power. It decides on all financial, operational, technical and administrative matters. The Council's main function is to make provision for the space segment necessary for carrying out the purposes of the Organization.³⁷ The Council shall endeavour to take decisions unanimously. If unanimous agreement cannot be reached, decisions on substantive matters shall be taken by a majority of the representatives on the Council representing at least two-thirds of the total voting participation of all Signatories and groups of Signatories represented on the Council, and decisions on procedural matters by a simple majority of the representatives present and voting, each having one vote.³⁸ Each representative has a voting participation equivalent to the investment share he represents. However, no representative may cast on behalf of one Signatory more than 25 per cent of the total voting participation in the Organization except where an investment share in excess of 25 per cent is not distributed among the other Signatories.³⁹

The Directorate is the executive branch of the Organization. It is headed by a Director General who is the chief executive and legal representative of the Organization.⁴⁰

III. INMARSAT and INTELSAT

INMARSAT and INTELSAT, established on 20 August, 1965 on an interim basis⁴¹ and on August 1971 on a permanent basis⁴², are both global international organizations established under public international law which intend to serve public communications needs by the use of outer space. INMARSAT is designed after the hybrid example of Intelsat: partly a classical international organization of which only States can be members, partly an international organization of mixed character to the extent that

³⁶*Id.*, Art. 13 (1).

³⁷*Id.*, Art. 15.

³⁸*Id.*, Art. 14 (2).

³⁹*Id.*, Art. 14 (3).

⁴⁰*Id.*, Art. 16.

⁴¹Agreement Establishing Interim Arrangements for a Global Communications Satellite System; for a text, see *Int'l Leg. Mat.* 805 *et seq.* (1964).

⁴²Agreement Relating to the International Telecommunications Satellite Organization, "INTELSAT", August 20, 1971; 23 U.S.T. 3813, T.I.A.S. 7532.

States may choose not to become shareholders in that organization, but may designate for that purpose other entities, either public or private. There are nevertheless significant differences between these two organizations.

INTELSAT is the outcome of purely national initiative, the creation in 1962 in the United States of the Communications Satellite Corporation COMSAT.⁴³ COMSAT was given the task

to establish, in conjunction and in cooperation with other countries, as expeditiously as practicable a commercial communications satellite system, as part of an improved global communications network, which will be responsive to public needs and national objectives, which will serve the communications needs of the United States and other countries, and which will contribute to world peace and understanding.⁴⁴

INMARSAT, however, is—as explained in the Introduction—the outcome of an international initiative.

INTELSAT is a profit-making organization. Its prime objective is the provision of a space segment required for international public telecommunications services on a commercial basis.⁴⁵ This seems logical, since COMSAT, INTELSAT'S embryo, was conceived as a private company which should make profits to satisfy its shareholders. Because of its different origin INMARSAT is less subject to strict commercial principles. It is a self-supporting organization, operating on a sound economic and financial basis having regard to accepted commercial principles, and its revenues should be sufficient to cover its operating, maintenance and administrative costs. The influence of large shareholders is limited, to the extent that a Signatory may in principle cast not more than 25 per cent of the total voting participation in the Organization.

Although both organizations are intended to serve the public interests, the difference in emphasis on commercial principles could in the case of Intelsat have led to the situation where the profit principle would have prevailed over the provision of telecommunications services as a matter of public interest. Such a situation has never occurred and is less likely to occur since COMSAT no longer acts as management services contractor and Intelsat itself performs the management functions.⁴⁶ However, it is worthwhile to note that in the Communications Satellite Act of 1962 the public interest only plays a role where the Federal Communications Commission is given the task to

⁴³Communications Satellite Act of 1962, Pub. L. 87-624, August 31, 1962 (H. R. 11040).

⁴⁴*Id.*, § 102 (a).

⁴⁵*Supra*, note 42, Art. III (a).

⁴⁶*Id.*, Art. XII (f), (g), (h).

prescribe such accounting regulations and systems and engage in such ratemaking procedures as will insure that any economies made possible by a communications satellite system are appropriately reflected in rates for public communication services.⁴⁷

The International Maritime Satellite Telecommunications Act, an amendment in the form of an addition of the Communications Satellite Act of 1962,⁴⁸ goes a little further by providing that the Secretary of Commerce shall

take all necessary steps to determine the interests and needs of the ultimate users of the maritime satellite telecommunications system and to communicate the views of the Federal Government on utilization and user needs to INMARSAT.⁴⁹

Be it indirectly, namely through the Organization on the Council of which COMSAT is represented, more governmental supervision and influence is made possible. Furthermore, the Federal Communications Commission has been given the power to issue instructions to the corporation with respect to regulatory matters within the jurisdiction of the Commission.⁵⁰

Another difference between INMARSAT and Intelsat which may seem slight, but which is significant as an indication of the different conceptions underlying the establishment of these two organizations, is that Intelsat owns the space segment, while INMARSAT has the option either to own or to lease the space segment.⁵¹

IV. *The INMARSAT Preparatory Committee*

The International Conference on the Establishment of an International Maritime Satellite System recognized the need to expedite the effective functioning of INMARSAT once established and the consequential need for certain preparatory studies and actions to take place between the closing of the Conference and the coming into force of the instruments establishing INMARSAT. It therefore resolved to establish a Preparatory Committee,⁵² which held five sessions during the period 10 January 1977 to 18 May 1979.

⁴⁷*Supra* note 43, § 201 (c)(5).

⁴⁸International Maritime Satellite Telecommunications Act, Pub. L. 95-564, November 1, 1978 (H. R. 11209).

⁴⁹*Id.*, § 504 (a) (4).

⁵⁰*Id.*, § 504 (d).

⁵¹See also W. von Kries, *Organisation Internationaler Nutzsatellitensysteme* (Nomos Verlag, Baden-Baden, 1977).

⁵²International Conference on the Establishment of an International Maritime Satellite System on the Establishment of a Preparatory Committee, Resolution 2. 15 Int'l Leg. Mat. 225 *et. seq.* (1976).

Participation in the Preparatory Committee was open to representatives of governments which had signed the INMARSAT Convention and the Operating Agreement and of designated entities which had signed the Operating Agreement; or to representatives of governments and to representatives of designated entities of those governments which had indicated their intention to initiate domestic procedures which would permit membership of INMARSAT.⁵³

On the basis of that provision representatives of the following governments and/or their designated entities participated in the Preparatory Committee's work:

—Australia	—Italy
—Belgium	—Japan
—Brazil	—Kuwait
—Bulgaria	—Netherlands
—Canada	—New Zealand
—Denmark	—Norway
—Finland	—Spain
—France	—Sweden
—Germany, Federal Republic of	—USSR
—Greece	—United Kingdom
—India	—United States ⁵⁴

The terms of reference of the Preparatory Committee were as follows:⁵⁵

- 1) Study of performance standards of land and ship earth stations, including ship earth station reliability, operational procedures, and interconnection with public telecommunications networks, taking into account the Panel of Experts' Report, studies of CCIR and CCITT, the experience obtained from the operation of existing systems, systems under development and other relevant studies.
- 2) Study of the Organization's space segment facilities options, including:
 - a) Studies of services, which, in view of Article 3 of the Convention, might be offered by the Organization and an assessment of the potential market, for consideration by the Council and, if appropriate, subsequently by the Assembly, identifying distress and safety communications and radiodetermination for early consideration, taking into account the Panel of Experts' Report and other relevant studies.

⁵³*Id.*, para. 1.

⁵⁴IMCO Doc PREPCOM V/6, Annex IV, Final Report of the Preparatory Committee to the INMARSAT Organization at 6 (May 29, 1979).

⁵⁵*Supra* note 52, para. 6.

- b) Technical and operational considerations of parameters for draft specifications of an INMARSAT space segment.
 - c) Evaluation of traffic and economic forecasts.
 - d) Such other studies as might be considered necessary.
- 3) Identification of tasks which might be assigned to a management services contractor or contractors and subsequently the study of the possibility of obtaining such contractor(s).
 - 4) With respect to the Director General and the Directorate:
 - a) The preparation of a proposal concerning their tasks and responsibilities.
 - b) Study of their relationship with any management services contractor or other contractors.
 - 5) Preparation of a draft organizational structure of the Directorate.
 - 6) Initiation of contacts with the host country prior to Council negotiation of a Headquarters Agreement.
 - 7) Study of possible premises for the Organization.
 - 8) Preparation of draft financial and staff regulations, taking into account, if possible, the regulations of similar organizations, for consideration by the Director General and subsequently by the Council.
 - 9) Preparation of draft Rules of Procedure of the Assembly and the Council, including rules for the election of officers.
 - 10) Any other task that may be necessary.

In carrying out its tasks under paragraph 2 of the terms of reference, the Preparatory Committee considered that there were two basic scenarios open to INMARSAT at its inception. These were:

- a) to commence operations as quickly as possible by the acquisition of existing space segment capacity and to plan the follow-on space segment for implementation when required;

- b) to defer commencement of operations until a space segment commissioned by INMARSAT could be brought into service.⁵⁶

The first scenario postulated INMARSAT acquiring the use of a space segment already existing (or about to come into existence), thereby providing a second generation maritime satellite system, preferably on a global basis, and ensuring continuity of maritime satellite services which is essential to promote and encourage their use further. Although the Committee did not reach any definite conclusion on a preferred scenario, it based its work mainly on the first one. Within this scenario the following options were identified:

- Option O: a dedicated system specified and procured directly by INMARSAT: it was, however, recognized that such a system could not be brought into operation in time to follow on after the existing MARISAT system had reached the end of its life;
- Option 1: a dedicated system of four MARECS satellites supplied to INMARSAT by the European Space Agency (ESA);
- Option 2: a shared/dedicated system, comprising three modified Intelsat V satellites in orbit plus two dedicated satellites procured and launched by Intelsat;
- Option 3: a shared/dedicated system, comprising three modified Intelsat V satellites plus three dedicated MARECS satellites, in orbit;
- Option 4: a shared system offered by COMSAT providing space segment capacity to INMARSAT through the use of the MARISAT II system.

Option O provided a basis for comparison with the other options. Consideration of Options 2 and 4 was abandoned when these options were not pursued by Intelsat and COMSAT, respectively.⁵⁷ In performing its task mainly on the basis of scenario (a) the Committee made use of the options open to INMARSAT according to Article 6 of the Convention.

⁵⁶*Supra* note 54, at 8.

⁵⁷*See also id.* at 8 and 41.

The following may be said of the work of the Committee, viewed in the light of the description of INMARSAT in part II.

The Committee concluded that the following service capabilities might be offered through the initial INMARSAT system: telephone, handling of priority traffic (including distress), facsimile, broadcast facsimile, medium speed data, leased channels, slow-scan T.V., broadcast telephone, telex, telegram, broadcast telephony, keyboard sender and EPIRB, recorded information services and low speed data.⁵⁸ As indicated in this list, the Committee agreed that Emergency Position-Indicating Radio Beacons (EPIRB's) should be included in the initial INMARSAT system. There was, however, no complete agreement on the frequencies to be used. Besides, additional service capabilities as ship polling, sound transmission (speech quality), radio determination (point and line position), and high speed data with telex return channel, have been identified, but they would require further study.⁵⁹

Some of the important operational requirements agreed by the Committee were the following. A maritime satellite system should be designed and implemented in such a way that it is, as far as practicable, compatible with the existing public switched telecommunications networks and services as defined in relevant ITU Regulations and CCIR/CCITT Recommendations. It should provide a grade of service for public correspondence such that the volume of traffic can be handled with little or no delay. The system should cater for service to all categories of ships. The long-term objective would be to provide maritime users with automatic access to all terrestrial telecommunications services. This would include telephone, telex, facsimile and data transmission. It should also be possible to handle distress traffic, telegrams and traffic in ship reporting systems. For both telephony and telegraphy the grade-of-service should correspond to a loss probability of not more than 2 per cent. For telephony, this was regarded as a tentative value for initial planning purposes.

In view of the requirement to cater for service capabilities to all categories of ships consideration should be given to the various ship terminal standards. For planning purposes, up to full eclipse operation should be considered. As a minimum the capacity should be sufficient to allow priority traffic, signalling traffic and limited public correspondence.

In the long term, the system should be technically capable of supporting shore stations in all member countries. It should be possible to exchange telephony and telegraphy capacity to meet service requirements associated with the use of the various types of ship terminals.⁶⁰

⁵⁸*Id.*, at 32-33.

⁵⁹*Id.*, at 32.

⁶⁰*Id.*, at 19-20.

Important system considerations were the following. The space segment for the first phase of INMARSAT service (1982-1988) should be compatible with ship terminals and shore stations already operational or planned. The initial INMARSAT system should use a communication system compatible with the existing MARISAT system extended for multiple shore station operation. A future INMARSAT system might require different parameters in shore stations and ship terminals. For example new access control equipment is likely to be required at shore stations and a new generation of ship terminals may have to be introduced; however, the changeover from the initial to the future system should permit existing terminals to be used throughout their economic lifetime.⁶¹

It seems that if these service capabilities are offered and operational requirements fulfilled, Article 3 (1) of the Convention is well implemented. The operational requirements furthermore guarantee that the INMARSAT space segment is open for use by ships of all nations.⁶²

As regards the areas to be served by INMARSAT⁶³, the Committee concluded that the INMARSAT system should provide service to ships in three main coverage areas which are determined by the orbital locations of satellites over the Atlantic, Indian and Pacific Ocean areas. Ideally, coverage would include the following area for each satellite:

- i) Atlantic Ocean satellite: eastern seaboard of North and South America, eastern portion of the Gulf of Mexico, Hudson Bay area, Caribbean Sea, Panama Canal, Cape Horn, North and South Atlantic Ocean, Cape of Good Hope, North Sea, Baltic Sea, Mediterranean Sea, Suez Canal, Red Sea and Gulf's Area.
- ii) Indian Ocean satellite: the limiting points of coverage will be the United Kingdom, Norway, Japan, Australia and the eastern seaboard of the USSR. Coverage should also be provided to the North Sea, Indian Ocean, Great Australian Bight, and sea routes south of Australia.
- iii) Pacific Ocean satellite: coverage would include Australia, Japan, the eastern seaboard of the USSR, the western seaboard of North and South America, the Pacific Ocean, Panama Canal, and the western portion of the Gulf of Mexico.

⁶¹*Id.*, at 20.

⁶²*Supra* note 13, Art. 7(1).

⁶³*Id.*, Art. 3 (2).

Coverage of polar regions, however, is not to be provided at least not during the first phase of service (1982-1988).⁶⁴

The Committee developed financial policies and procedures,⁶⁵ containing *inter alia* provisions on INMARSAT's charging policy and principles. These provisions recognize explicitly that INMARSAT is required to use good commercial practices. In respect of a charging policy these provisions say that

in order to optimise revenues over the long-term to the point where the required compensation for use of capital is reached, it is advisable to adopt a charging policy which would not necessarily recover all short term costs, but which would develop the widest market possible⁶⁶

and that

the objective of INMARSAT should be to set its charges at a level which would enable the Organization to recover all its costs over a reasonable period and encourage efficient use of the space segment.⁶⁷

Thus, sufficient basis seems to be given for a correct implementation of Articles 7 (3) and 19 (1) of the Convention. Attention should be drawn to the fact, that while Signatories should pay the same charge for each service capability, the Committee considered that a different charge may be levied for non-Signatories. The provision of Article 19 (2) of the Convention and of Article 19 (3) in conjunction with Article 7 (2) are thus carried out to the letter.

The Committee adopted draft procurement regulations.⁶⁸ These regulations state, under the heading "General Policies", that all procurement of goods and services shall be effected by the award of contracts, based on responses to open international invitations to tender, to bidders offering the best combination of quality, price and the most favorable delivery time. If there are bids offering comparable combinations the allocation of the contract shall be such as to encourage world-wide competition in the supply of goods and services.

⁶⁴*Supra* note 56 at 21-22.

⁶⁵IMCO Doc. PREPCOM/ECON/REPORT 4, Appendix 4 at 61 (July 7, 1978).

⁶⁶*Ibid.*

⁶⁷*Ibid.*

⁶⁸IMCO Doc. PREPCOM/ORG/REPORT 3, Annex V at 3 (April 6, 1978) and Final Report of the Preparatory Committee, *Supra* note 54 at 67-68.

This last provision seems not fully compatible with further provisions in the procurement regulations, where it is stated that an award shall be made to that bidder whose bid offers the best combination of quality, price and favorable delivery time, and taking into account where appropriate the need to encourage world-wide competition.⁶⁹

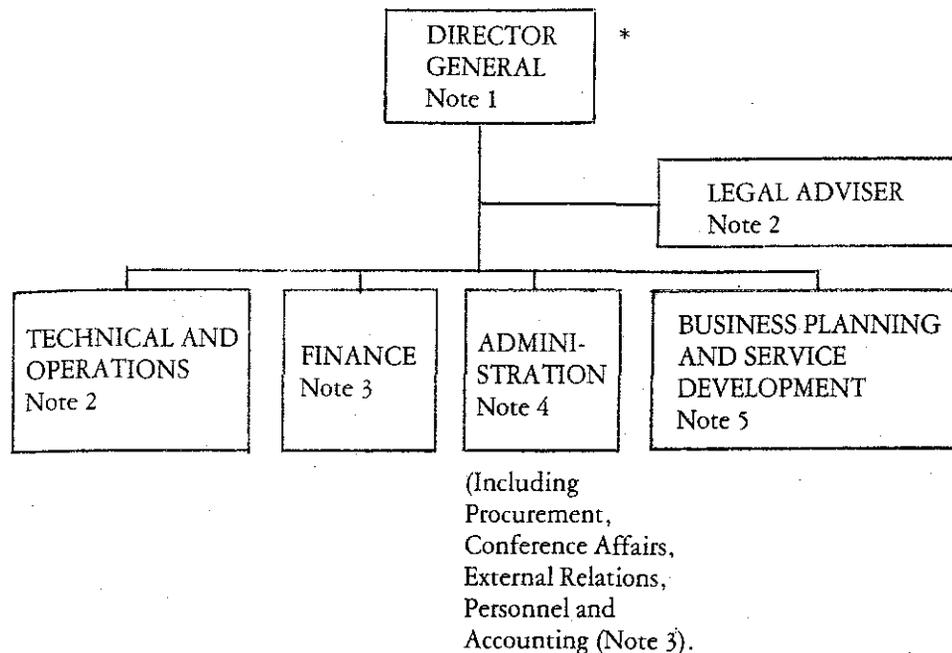
The conclusion seems justified that the balance which Article 20 of the Convention established between the two principles to be followed in the procurement policy of INMARSAT, is upset in favor of the principle of the best combination of quality, price and favorable delivery time.

In view of the scenario on which the Committee mainly based its work (scenario a) and the options identified within that scenario, the Committee identified the following functional areas in which the tasks of the Directorate of INMARSAT could be grouped:⁷⁰ Financial, Administration, Procurement, Legal, Operational, Technical, Business Planning and Service Development, Management Audit. The Committee was of the opinion that given scenario (a) the operational and technical functions could be performed by employing a management services contractor. However, high level expertise in these fields should be available within the Directorate. On the basis of these considerations the Committee developed the following draft organizational structure.⁷¹

⁶⁹IMCO Doc. PREPCOM/ORG/REPORT 3, Annex V at 6 (April 6, 1978).

⁷⁰*Supra* note 54 at 56-65.

⁷¹*Id.*, at 74.



*The chart identifies the main functional areas of the Organization. Such functions may be established at differing grade and salary levels.

Note 1. Depending on the number of divisions reporting to the Director General it may be appropriate at a later stage to have one or more Deputy Directors General.

Note 2. In view of the early requirement for the Organization to enter into contracts for provision of space segment the establishment of this function will be an early priority.

Note 3. This function will not need to be exercised at a high level in the initial stage of the Organization. Limited accounting functions can be performed initially under the Head of Administration.

Note 4. In view of the requirements to recruit staff and conduct conferences (for example), from the outset the establishment of this function will be an early priority.

Note 5. The priority for establishing this function will require further consideration by the Council.

(The detailed functions under the above structure appear in paragraphs 2-4 under Section V of the Final Report).⁷²

⁷²*Ibid.*

In addition to the above comparison of some of the principles in the Convention with the recommendations of the Preparatory Committee, it may be said that the detailed work of the Committee provides ample guidance for the INMARSAT Council in taking decisions on the matters referred to in Article 15 (a), (b), and (c).

V. INMARSAT's Hurdle-Race

INMARSAT's creation has not been an easy process. Even now when it is established and its constitutive instruments have entered into force, INMARSAT is still subject to controversies that are strong enough to threaten its independence and its operational functioning.

In the days of the Panel of Experts the United States, while supporting the need for a maritime satellite telecommunications system, held the view that not enough was known of system requirements to allow effective consideration of institutional or organizational arrangements at that time. It therefore proposed the concept of an International Maritime Communications Satellite Consortium in which membership would be open to national and international entities, including PTT administrations, commercial telecommunications carriers, or other entities appropriately authorized to participate in the Consortium.⁷³ The formation of a consortium, however, did not find support as it was felt that the policy control of the global maritime satellite system should be exercised by an intergovernmental organization.⁷⁴ The reference to "an intergovernmental organization" covered problems that were raised in the discussions of the Panel of Experts, namely that a consortium of the kind proposed would have no legal status under public international law, no international legal personality and would consequently absolve states from any responsibility and liability they were bound to bear for operations in outer space on the basis of existing public international law.

The United States also proposed that a user organization be established within IMCO to define and arrange for the satisfaction of user needs. This concept was not generally accepted because of the belief that IMCO's primary concern is safety.⁷⁵ The United States further proposed that a careful analysis be made of the possible utilization of Intelsat for the provision of a maritime satellite telecommunications service.⁷⁶ Advantages of Intelsat exercising policy and financial control over the maritime satellite service would be

⁷³*Supra* note 6, at 93-94.

⁷⁴*Id.* at 94.

⁷⁵*Id.*

⁷⁶*Id.* at 94-95.

- a possible early launch and thus a significant time saving;
- attractive financial consequences
- attractive organizational consequences such as the availability of operating experience;
- compatibility of the space segment with existing earth stations and facilities.⁷⁷

There was however no support

for an arrangement whereby INTELSAT would be the Organization exercising policy and financial control over the Maritime Satellite Service. Under such arrangement the maritime element would be subject to decisions of the Board of Governors of INTELSAT where voting rights would be determined largely on the basis of total utilization of the space segment. Since the maritime element would be only a small proportion of the total space segment, important maritime countries with little or no fixed service traffic would have only minor control over the maritime service facilities. These considerations would apply irrespective of whether the Maritime Satellite Service were provided by means of a dedicated or multi-purpose system.⁷⁸

The Panel further noted that INTELSAT at that time did not include some major maritime countries.

Since maritime communications must be fully international, particularly with respect to the safety to life at sea, the absence of any major maritime country was regarded as a serious disadvantage.⁷⁹

Obstacles of this kind, however, would in the opinion of the Panel not apply

to the situation where INTELSAT provided and/or managed the maritime satellite facilities as a contractor to a maritime satellite organization, assuming that the Conference of Governments decides to establish such an organization.⁸⁰

The controversy with the United States over the form which the organizational arrangements for the establishment of an international maritime satellite system should take were not solved in the Panel of Experts. When IMCO's Subcommittee on Radiocommunications at its meeting from March 5-9, 1973, voted in favor of convening an international conference of governments to take conclusive action on the establishment of the maritime service, the only opposition vote was cast by the United States.⁸¹

⁷⁷IMCO Doc. MARSAT/IV/3a/4 (December 6, 1973).

⁷⁸*Supra* note 6 at 95.

⁷⁹*Id.*

⁸⁰*Id.*

⁸¹Aviation Week and Technology, March 26, 1973 p. 59.

At the conclusion of the last session of the Panel of Experts the United States reserved its position on the entire report of the Panel and requested inclusion in the report of the following statement:

In the view of the United States of America, establishment of a new international organization is likely to pose problems and result in lengthy negotiations leading to serious delays in providing a maritime satellite capability. While agreeing that considerable work has been performed by the IMCO Panel of Experts, the United States still believes that sufficient analyses of all possible alternative institutional arrangements as well as of the closely related economic and technical factors, have not been made. The United States considers further that even if sufficient study and preparatory work were to verify the need for a new international organization to provide a maritime satellite capability, the United States would still have concerns with a number of fundamental aspects of the Panel's work, including inadequacies and inconsistencies in the proposed draft agreement, the limited nature of economic analysis completed which do not include a system cost-benefit analysis, and certain shortcomings in study of the operational aspects of system performance such as the important area of ship terminal equipment reliability.⁸²

At the first session, however, of the International Conference on the Establishment of an International Maritime Satellite System the United States, together with the other states represented at the Conference, agreed to the formation of an international organization for the effective management of a maritime satellite system. The solving of this problem immediately created another, namely participation in such an organization. In countries like Japan and the United States the provision of telecommunications services is the responsibility of private entities. Accordingly, the governments of these countries cannot accept any financial, technical and operational responsibility. The USSR had serious reservations about designating a commercial entity as a representative in INMARSAT. It disapproved the notion of private firms assuming governmental responsibilities.

The Conference finally went along with the US demand and accepted the principle that States could transfer the financial, technical and operational responsibilities to entities, public or private, designated by those States. This principle was effected by establishing a convention between states and an operating agreement between designated entities. Governmental matters were dealt with in the Convention; financial, technical and operational matters in the Operating Agreement.

Other major areas of disagreement at the Conference were the division of responsibilities between INMARSAT's Assembly and Council, the voting in the Council and the procurement policy. Solutions for these basic questions were negotiated between the United States, the USSR and some Western European countries together with the question of participation in the organization. The compromises found were referred to as "the package deal".

⁸²*Supra* note 6, Preface at (ii) and (iii).

The United States took the position that the Assembly on which each member state would be represented and have one vote should have the power only to make recommendations and express its views to the Council. The Council should have the ultimate decision-making power in respect of all matters of a technical, operational and financial nature. This was the logical and inevitable consequence of the fact that the Council was to "be made up of the biggest investors and therefore the biggest users of the system".⁸³

Western European countries did not object very strongly to this view. In fact they supported it and used it, together with their concession on the question of participation, as change for stronger Western European wishes in respect of voting in the Council and procurement policy. The Socialist and developing countries supported the idea of the Assembly as the supreme organ with broad policymaking powers. This idea conforms with the views strongly held by those countries on the sovereign equality of states. The United States, however, maintained its position despite all the opposition and won.

The developing countries were accommodated slightly by enlarging the originally envisaged number of Council members from 18 to 22, securing the four additional seats for the developing countries. Thus these countries would have some say in the major decisions. Their say, however, will be rather limited given the fact that voting in the Council on substantive matters is weighted by the investment share held.⁸⁴

Voting in the Council proved a real stumbling block. The Socialist countries, supported by some developing countries, advocated that each country should have one vote, stressing again the principle of the equality of states. The United States insisted on a system where the voting power is commensurate with the size of the investment. The Western European countries could accept the weighted voting system, but proposed a requirement for substantive decisions different from that proposed by the United States. The former proposed the requirement of one third of the representatives representing a majority of the total investment shares. The latter proposed the requirement of the majority of the representatives representing two-thirds of the total investment shares. Again, the US view prevailed. The United States, however, had to accept a limitation of the voting strength: no representative may in principle cast more than 25 per cent of the total voting participation in the Organization.⁸⁵

In respect of procurement most policies proposed provided for the award of contracts to bidders offering the best combination of quality, price and the most favourable delivery time. The proposals differed in the extent to which they would oblige the Council to take into account the need to maintain and encourage world wide

⁸³IMCO Doc. MARSAT/CONF/SR-6 at 6 (April 25, 1975).

⁸⁴*Supra* note 13 Art. 14 (2).

⁸⁵*Id.* Art. 14 (3) (a).

competition in the supply of goods and services. Such an obligation was supported by the Western European and Socialist countries. The United States could accept such an obligation only if two or more bids offered comparable combinations of quality, price and delivery time. This U.S. position met with strong opposition, since in view of the technological lead vested in one or two large corporations the United States would effectively have had a supplier monopoly over less advanced firms in other parts of the world. The text that finally emerged constituted a balanced compromise between the two views, with a slight prominence for the idea of world-wide competition.

During the period of the Preparatory Committee's work two developments attracted attention and need to be mentioned. The first development began to unfold outside the Committee and stemmed from the desire to ensure that there would be an operational satellite system to follow on from the existing MARISAT system which would reach the end of its design life in 1981. It was therefore considered necessary to make firm decisions to procure satellites for a follow-on system some time before INMARSAT itself could do so.⁸⁶ Since the Preparatory Committee was precluded by its charter from committing INMARSAT, these procurement decisions needed to be made elsewhere.⁸⁷

The origin of this development was an approach from the MARISAT Consortium, led by COMSAT, to the European Space Agency (ESA) at the beginning of 1977, when the Consortium had begun to examine the options open to it for a follow-on system to its existing system in order to fulfill its obligation to ensure that a maritime space segment would continue to be available after the end of the nominal lifetime of the original spacecraft in 1981. The concept was that, building on the two maritime satellites to be developed by ESA, a consortium of telecommunications administrations, including the MARISAT Consortium on behalf of the United States, would form a "Joint Venture" to procure a further two spacecraft, so that the four satellites could then be operated as a world-wide system.⁸⁸ However, the Consortium made it clear that the Joint Venture represented only one of the options it was examining, other options being the procurement of wholly American dedicated spacecraft, or of a further generation of hybrid civil/military spacecraft.

While these Joint Venture talks were extended in late 1977 to include other major maritime nations, the United States withdrew from these talks. The reason for this was that the bills tabled in both the U.S. House of Representatives and the Senate on U.S. participation in INMARSAT nominated COMSAT rather than the MARISAT Consortium as the U.S. signatory. The other participants (Australia, Belgium, Denmark, France, the Federal Republic of Germany, Greece, India, Italy, Japan,

⁸⁶IMCO Doc. MARSAT/CONF./Circ. 3, at 2-3.

⁸⁷*Supra* note 52, para. 6.

⁸⁸*Supra* note 86, Annex III.

Kuwait, Netherlands, Norway, Spain, Sweden, UK and USSR), representing nearly 75% of the INMARSAT initial investment shares, decided to continue their deliberations in order to ensure the much desired continuity of service, the ultimate goal being the establishment of an international Pre-INMARSAT Joint Venture to procure satellites and services.⁸⁹

The Joint Venture examined not only proposals made by ESA, but also proposals made by Intelsat. In July 1978 the Joint Venture participants prepared a list of three options for a worldwide space segment for future consideration. These options were:

- 1) 4 MARECS dedicated satellites in orbit;
- 2) 3 Intelsat V satellites equipped with maritime communications systems in orbit, plus 2 dedicated satellites provided by Intelsat;
- 3) 3 Intelsat V satellites with maritime communications systems plus three MARECS satellites in orbit.⁹⁰

Following a detailed study of these options, a preference was expressed for Option 3, the so called "3 + 3 Option".⁹¹ It may be noted that Options 1, 2 and 3 correspond with Options 1, 2 and 3 considered by the Preparatory Committee in carrying out its task under paragraph 2 of its terms of reference.

Shortly thereafter COMSAT offered to provide space segment capacity to INMARSAT through the use of what was described as the MARISAT II system.⁹² This system consisted of Maritime Communications Satellite (MCS) Payloads to be incorporated in satellites owned and operated by Hughes Communication Services, INC. (Hughes) to provide communications services to the U.S. Government (pursuant to a contract between Hughes and the U.S. Navy) and possibly to other users.⁹³ The four MCS Payloads would be deployed at four orbit locations suitable for the provision by INMARSAT of maritime satellite communications services on a global basis. The four MCS Payloads would be located over the Atlantic, Pacific and Indian Ocean regions. This offer which was made on a best efforts basis, would have, it was said by COMSAT, the fundamental advantages of being economically sound as a result of sharing of costs

⁸⁹*Id.*

⁹⁰IMCO Doc. PREPCOM III/WP. 2 (July 19, 1978).

⁹¹See also: IMCO Doc. PREPCOM III/WP. 2 (July 19, 1978); IMCO Doc. PREPCOM IV/INF. 2 (November 30, 1978); IMCO Doc. MARSAT/CONF./Circ. 3 at 2-3, and Annex III.

⁹²IMCO Doc. PREPCOM IV/5/1 (December 18, 1978).

⁹³IMCO Doc. PREPCOM IV/5/1 and attached memorandum at 2 (December 18, 1978).

between users. It was also stressed that the successful implementation of a first generation INMARSAT system using the MARISAT II Payloads could be enhanced by the complementary use of two MARECS satellites.⁹⁴

At their meeting in October 1978 the Joint Venture participants passed a resolution, expressing the view that any offer of a joint military/commercial hybrid maritime communications satellite system would be inconsistent with the basic principles and main purposes of INMARSAT.⁹⁵

COMSAT's offer was also discussed by the Preparatory Committee at its fourth meeting in December 1978. In these discussions a number of reasons (relating to policy and technical aspects) were advanced in opposition to the offer. They included the following:⁹⁶

—the satellites carrying the MARISAT II system would be essentially domestic in character, serving the requirements of the United States Navy;

—the MARISAT II system would not therefore be subject to true international control and as such would be prejudicial to the international character of INMARSAT and to the autonomy of its services;

—the offer with regard to MARISAT II did not provide for appropriate international participation, threatened the coming into being of INMARSAT and presented the possibility of competing systems;

—the sharing of a satellite system with the United States Government customer in the manner proposed was considered to be inconsistent with the purpose of INMARSAT as described in Article 3 of the INMARSAT Convention.

While opposing the COMSAT offer all delegations (except of course the U.S. delegation) supported the "3 + 3 Option" referred to above, although some

⁹⁴IMCO DOC. PREPCOM IV/5/1 (December 18, 1978).

⁹⁵IMCO DOC. MARSAT/CONF./Circ. 3 Annex III (December 29, 1978); IMCO DOC. PREPCOM III/WP. 2 (July 19, 1978); IMCO DOC. PREPCOM IV/INF. 2 (November 30, 1978).

⁹⁶IMCO DOC. PREPCOM IV/8 at 9-11 (December 22, 1978).

modifications of the Option were advocated (two MARECS satellites rather than three or two Maritime Communications Sub-Systems rather than three).⁹⁷ The reactions of the U.S. delegation can be summarized as follows:⁹⁸

—the delegation objected to the characterization of the offer as a military/commercial hybrid system; it does not involve the use of a military satellite and is not a joint military/commercial hybrid satellite system; it consists of communications payloads owned by COMSAT General Corporation which are incorporated in spacecraft owned and operated by a private United States company that will provide satellite capacity to at least two different customers, one of which is a United States Government customer;

—the purpose of the offer was to present a detailed statement of a space segment option that INMARSAT should consider; there was no intention or expectation that any decision could be made by the Preparatory Committee on the question of space segment options;

—the reasons given in opposition to the offer should be characterized as comments; the proposal itself set forth the only authoritative statement of the COMSAT offer, and COMSAT did not accept the interpretations contained in the comments;

—it reiterated that the complementary use of two MARECS satellites could enhance the MARISAT II proposal;

—the United States interest was to assure that INMARSAT would have an opportunity to consider the MARISAT II option, as well as all other options and that procurement decisions would be taken consistent with Articles 5 and 20 of the Convention.

Since this offer was not pursued, the Preparatory Committee did not discuss it any further at its fifth and final session.

The last two meetings of the Joint Venture participants (in January and March 1979) were again attended by a delegation from the United States. This was possible because the U.S. Congress had approved legislation on the U.S. participation in INMARSAT. The Joint Venture participants, except those from Canada and the United States, reiterated their support for the option consisting of three Intelsat MCS and three MARECS satellites (the "3 + 3 Option"). The Joint Venture participants also agreed

⁹⁷*Id.*

⁹⁸IMCO DOC. MARSAT/CONF./Circ. 3, Annex II, at 39-40 (December 29, 1978); and IMCO DOC. PREPCOM IV/8 at 11-12 (December 22, 1978).

that in view of that support and the imminent establishment of INMARSAT, it was, at that time, unnecessary to establish formally a Pre-INMARSAT Joint Venture.⁹⁹

The second development which attracted particular attention during the period of the Preparatory Committee's work was the acceptance by COMSAT in February 1979 of an initial investment share of 30 per cent pursuant to paragraph (b) (ii) of the Annex to the Operating Agreement (an increase of the initial investment share listed in the Annex by 13%).¹⁰⁰ The reason given for the increase was that an investment share of 30% would better approximate COMSAT's projected initial use of the INMARSAT system.¹⁰¹ Another consideration might have been that the increase would stimulate other states and telecommunications entities to become parties to the Convention and Signatories to the Operating Agreement and would thus ensure the timely entry into force of both instruments. Unofficially COMSAT also made clear that it was willing to increase its initial investment share further if other states and telecommunications entities should fail in achieving the entry into force of the Convention and the Operating Agreement.

COMSAT had informed all other members of the Preparatory Committee some time in advance of the actual increase and had been requested by several members not to effect any increase unilaterally but to do so in a coordinated manner in order not to distort the carefully negotiated balance in investment shares contained in the Annex to the Operating Agreement. Nonetheless, COMSAT raised its initial investment share to 30% and provoked thereby further unilateral actions. Kuwait and the USSR raised their initial investment share from respectively 1.48 per cent to 3 per cent and from 11 per cent to 21 per cent.¹⁰² Even when the requirements for entry into force were met on 17 May 1979 by the signature of the Operating Agreement by Teleglobe Canada (96.24 per cent was subscribed for), attempts to restore the share levels listed in the Annex continued.¹⁰³ A stock-market situation arose on the evening of July 15, 1979, - a few hours before the Convention and the Operating Agreement entered into force and paragraph (b) (ii) of the Annex became inoperative - when the IMCO Secretariat at the request of the Preparatory Committee had made arrangements to enable Signatories to submit written communications indicating the acceptance of a higher initial investment share.¹⁰⁴ At midnight INMARSAT proved a smashing success: the subscription totalled

⁹⁹IMCO DOC. PREPCOM V/5/1 at 3 (April 24, 1979).

¹⁰⁰IMCO Circular Letter No. 597 (February 16, 1979).

¹⁰¹*Id.*

¹⁰²IMCO Circular Letter No. 619 (April 6, 1979); IMCO Circular Letter No. 622 (April 23, 1979).

¹⁰³IMCO Doc. PREPCOM V/6 at para's 56-61 (May 22, 1979).

¹⁰⁴*Id.*, at para. 9.

288.6453 per cent. The following list indicates how the subscription was made up; the investment shares after adjustment pursuant to paragraph (c) and (d) of the Annex to the Operating Agreement are indicated in brackets.¹⁰⁵

•COMSAT (United States)	:	65.0000%	(22.5043%)
•British Post Office (United Kingdom)	:	31.9367%	(11.0571%)
•Morsviazsputnik (USSR, Byelorussian SSR Ukrainian SSR)	:	45.5000%	(15.7539%)
•Norwegian Telecommunication Administration (Norway)	:	25.4367%	(8.8067%)
•Kokusai Denshin Denwa Co. Ltd. (Japan)	:	22.5983%	(7.8240%)
•Amministrazioni delle Poste e delle Telecomunicazioni (Italy)	:	10.8333%	(3.7507%)
•Hellenic Telecommunications Organization S.A. (OTE) (Greece)	:	9.3167%	(3.2256%)
•Netherlands PTT (Netherlands)	:	9.3167%	(3.2256%)
•Teleglobe Canada (Canada)	:	8.4500%	(2.9256%)
•Compania Telefonica Nacional de Espana (Spain)	:	6.5000%	(2.2504%)
•Swedish Telecommunication Administration (Sweden)	:	6.0667%	(2.1004%)
•General Directorate of Posts and Telegraphs (Denmark)	:	4.4167%	(1.8754%)
•Overseas Telecommunications Commission (Australia)	:	5.4167%	(1.8754%)
•Overseas Communications Service (India)	:	5.4167%	(1.8754%)
•Empresa Brasileira de Telecomunicacoes (EMBRATEL) (Brazil)	:	5.4167%	(1.8754%)
•Ministry of Communications (Kuwait)	:	6.5000%	(2.2504%)
•Poland	:	5.4167%	(1.8754%)
•Belgian RTT Administration (Belgium)	:	1.9500%	(0.6751%)
•Administration of the Posts and Telegraphs (Finland)	:	1.9500%	(0.6751%)
•Telecommunication Authority of Singapore (Singapore)	:	5.4167%	(1.8754%)
•Postmaster General (New Zealand)	:	0.7800%	(0.2701%)
•State Shipping Company, Varna (Bulgaria)	:	0.3300%	(0.1143%)
•Ministry of Posts and Telecommunications (Algeria)	:	0.0500%	(0.0500%)
•Egypt	:	0.0500%	(0.0500%)
•Peking Marine Communication and Pilot Company (People's Republic of China)	:	3.3300%	(1.1529%)
•Companhia Portuguesa Radio Marconi (CPRM)	:	0.2500%	(0.0865%)

Despite a dispute over the legality of the increase of initial investment shares by some Signatories the Council at its first session in July 1979 agreed that it was composed of the Signatories or groups of Signatories from the following countries: United States; USSR (Byelorussian SSR and Ukrainian SSR); United Kingdom; Norway; Japan; Italy; Greece; Netherlands and Belgium; Canada; Kuwait; Spain; Sweden and Finland; Australia; Brazil; Denmark; India; Poland and Bulgaria; Singapore.¹⁰⁶ Thus the Council had 18 members. At its first session in October 1979 the Assembly elected representatives from Argentina, Algeria, Bulgaria and the People's Republic of China in order to ensure a just geographical representation on the Council.¹⁰⁷ As a consequence

¹⁰⁵IMCO Circular Letter 665 (August 24, 1979).

¹⁰⁶IMCO DOC. COUNCIL/SR. 1 at para. 7 (July 16, 1979).

¹⁰⁷IMCO DOC. ASSEMBLY I/12 at para's 26-34 (October 26, 1979).

of this election, the solution of the dispute referred to above and the new membership of the Federal Republic of Germany and France the Council at its second session in November 1979 agreed that it was composed of the Signatories or groups of Signatories from the following countries (the investment shares are indicated in brackets):

United States	(23.50000%)
USSR (Byelorussian-and Ukrainian SSR)	(14.17441%)
United Kingdom	(9.94907%)
Norway	(7.92419%)
Japan	(7.03997%)
Italy	(3.37484%)
France	(2.90237%)
Federal Republic of Germany	(2.90237%)
Greece	(2.90237%)
Netherlands (2.90237%) and Belgium	(0.60745%)
Canada	(2.63243%)
Kuwait	(2.02489%)
Spain	(2.02489%)
Sweden (1.88992%) and Finland	(0.60745%)
Denmark	(1.68747%)
Australia	(1.68747%)
India	(1.68747%)
Brazil	(1.68747%)
Poland	(1.68747%)
Singapore	(1.68747%)
People's Republic of China	(1.24387%)
Argentina	(0.60745%)
Bulgaria	(0.10632%)
Algeria	(0.05000%) ¹⁰⁸

VI. *Conclusions*

The Convention, the Operating Agreement and the work performed by the Preparatory Committee constitute the basis on which INMARSAT can start functioning quickly and effectively. However, the hurdles I have mentioned and INMARSAT has had, and is still having, to take are characteristic of an ordinary economic struggle, of a fight for a monopoly position in the supply of communications via satellite, the outcome of which may determine whether INMARSAT will be a truly international organization or will be so in name only.

Although written evidence is not available and my opinion has been formed by talking to people who have been in the satellite communications business for a long

¹⁰⁸IMCO DOC. COUNCIL/2/SR. 4, Annex I (November 2, 1979).

time, I believe that the origin of this economic struggle is a controversy that arose between the United States and the United Kingdom right from the start of the Interim Communications Satellite Committee established in 1964 by the Agreement establishing Interim Arrangements for a Global Commercial Communications Satellite System¹⁰⁹ and that was finally decided by the Plenipotentiary Conference on Definitive Arrangements for INTELSAT (February 1969-May 1971).¹¹⁰

The controversy concerned the question whether or not INTELSAT could provide specialized telecommunications services along with the international public telecommunications services it was to provide in principle. The United States (read: COMSAT) favored INTELSAT providing those specialized services. INTELSAT could thus become the one and only international organization in the field of communications services via satellite, a logical position in view of COMSAT's strong position in INTELSAT. The United Kingdom was opposed to INTELSAT providing specialized telecommunications services since it would strengthen further the already strong position of the United States in this field and in respect of the supply of a space segment and related facilities required to provide satellite telecommunications services.

The U.S. view prevailed and the INTELSAT Agreement¹¹¹ entitles the Organization to provide specialized services. However, until recently INTELSAT made no use of this right. Thus the UK, together with other Western European countries interested in space technology, has twice been able to make a better deal than would have been possible within the INTELSAT context.

The first of these was the Aeronautical Satellite Programme (Aerosat) where Western Europe negotiated a 47 per cent share.¹¹² However, for reasons which do not need to be spelled out in the context of this article, the Aerosat Programme has not come off the ground. The second deal was INMARSAT; no surprise, given the fact that Western European nations own about 36 per cent of the world's shipping tonnage.¹¹³

¹⁰⁹*Supra* Note 41.

¹¹⁰*Supra* note 42, Art. III (c) (iii).

¹¹¹*Id.*

¹¹²Arrangement to Establish an Aeronautical Space Segment Capability between ESRO, COMSAT General Corp. and the Government of Canada, December 2, 1974, Art. 9 *See* European Space Agency, Basic Texts of ESA, Vol. II, (1978).

¹¹³ Belgium	0.43%	Netherlands	1.30%
Denmark	1.33%	Norway	5.41%
Finland	0.60%	Portugal	0.29%
FRG	2.07%	Spain	2.01%
France	2.89%	Sweden	1.12%
Greece	9.04%	United Kingdom	6.76%
Italy	2.83%		

(Noted with acknowledgement to Lloyd's Register of Shipping Statistical Tables 1979, Table 1.)

As was explained above, the United States first tried to prevent the establishment of an international organization to provide maritime telecommunications services. Realizing it could not achieve that goal, it shifted policy, agreed on an international organization and achieved on important issues in the Convention and the Operating Agreement (position of the Council versus the Assembly, voting in the Council, procurement) results that would offer sufficient protection for the vested interests of the United States. Thereupon COMSAT strengthened its position in INMARSAT by raising its investment share. This move has been countered to some extent by proportionate increases by other Signatories, but COMSAT still gained some 6% and now has a share of 23.5 per cent in INMARSAT.¹¹⁴

COMSAT's policy in respect of a second generation of maritime satellites which could be transferred to or leased by INMARSAT has also been one that aimed at protecting the U.S. interests. While keeping Western Europe from going an all-European road (4 MAROTS/MARECS) by initiating talks on a MARISAT/MAROTS (MARECS) system, COMSAT finally came up with its MARISAT II system, in principle an all-American solution for a second generation of maritime satellites.¹¹⁵ Under all this elaborately worked out pressure the Western European countries started looking for a compromise and expressed support for the "3 + 3 Option", thereby keeping pace with countries which might otherwise have chosen the side of COMSAT.

One should realize that Intelsat's participation in the competition for the provision of a space segment for maritime communications had been prompted strongly by COMSAT and constituted the best solution for the United States after the MARISAT II system, given its position in Intelsat. One surprising fact, however, is that the United Kingdom which had fought Intelsat's providing specialized telecommunications services became the strongest proponent of the "3 + 3 Option", thereby wholeheartedly embracing Intelsat.

The conclusion seems justified that in this game COMSAT's actions are well planned and follow a policy which is based on the protection of its own interest without going so far as to outmaneuver itself. The attitude of Western Europe seems to be defensive, prompted by the overriding wish to keep the influence of the United States within bounds and dictated by COMSAT's moves; its actions lack clearly set goals and a well-defined policy to achieve these goals.

This lack of clear goals and a clear policy is first of all the consequence of a lack of unity within the European Space Agency (ESA) on the programmes to be developed. The MARECS-programme is part of a package deal in which the UK had to satisfy the French interests in the European Communications Satellite Programme. It is also the

¹¹⁴*Compare*: Operating Agreement on INMARSAT, Annex I with IMCO DOC. COUNCIL/S.R. 4, Annex I (November 2, 1979).

¹¹⁵*Supra* note 92.

consequence of ESA being an intergovernmental organization where commercial views often clash with political ones and where the decision-making process is not sufficiently transparent (to blur out differences and thus ensure some progress) and too slow to keep pace with events. In general it may be said that although Western Europe has become an economic power, it falls short of the expectations it raises, largely because of inner discord.

A final word on the position of the USSR, which, judging by its actions, seems simple and straightforward, but may be deceptive in its simplicity. This country has been a strong, if not the strongest advocate of the establishment of an international organization to provide maritime satellite services. In order to achieve that goal, the Soviet Union has been prepared to make quite substantial concessions. It accepted the participation of private companies, the limitation of the role of the Assembly in favor of that of the Council, the limited membership of the Council, its composition on the basis of financial participation and its weighted voting system. The Soviet Union even went so far as to create a new entity to become the Signatory of the Operating Agreement: Morsviazsputnik.¹¹⁶

The Soviet interest in shipping and fishing¹¹⁷ counts to a great extent for this flexible attitude. Except in INMARSAT the USSR could nowhere play an important role in the field of maritime satellite communications. At the same time it provides the Soviet Union with an excellent opportunity to keep informed on and become acquainted with "western" technology in this field, an opportunity it let slide in the case of Intelsat. In respect of the space segment for INMARSAT the Soviet Union expressed support for the option consisting of four MARECS satellites, but shifted to the "3 + 3 Option" when the Western European countries did so. Again, it may be taken that the USSR, without isolating itself, will support the space segment option which offers it the best technological advantages. In this respect it is interesting to note that the Soviet Union and the European Space Agency are exploring the possibility of launching a MARCES satellite with a soviet rocket.¹¹⁸

¹¹⁶IMCO Circular Letter of 615.

¹¹⁷Taking fishing vessels over 100 BRT the composition of the USSR fishing fleet is estimated as follows:

	Number	Total BRT
—fishing factories and carriers	576	2.765.042
—fishing vessels including factory trawlers	3,884	3.580.395

For source, see *supra* note 113, Tables 13, 14.

¹¹⁸Aviation Week and Space Technology, February 27, 1978, p. 45 and January 21, 1980, p. 13.

Fernando Lay

I. Introduction

Ten years following the landing on the moon, which was the ultimate adventure of the technological era, a new tendency is emerging in space activities, characterized by criteria of rationality and immediate utility for mankind.

The initial stages of the space era were dominated by a quest for prestige and a spirit of international competition befitting a commercial sports event. In the last decade we pursued programs more modest, but more likely to affect directly the lifestyle of the great majority of human beings. Today the emphasis is on the "rediscovery" of our planet and the increasing improvement in space instruments of immediate interest for man.¹

The American and European space programs feature new, low-cost satellites for radio, telephone and television communications, for meteorology, for research and inventory of mineral, grain and water resources on earth, and for the study of the environment. In addition, it is the Space Shuttle which is expected to mark the advent of regular space voyages,² an orbiting space laboratory (Spacelab), and a great telescope to study the universe beyond the distortions of the atmosphere. Human exploration of interplanetary space has been set aside to make way for automated space probes. In the Soviet programs, the main trend seems to point towards permanently inhabited stations in earth orbit (Salyut), to be used for observation and research in space and, also in the future, as departure bases for interplanetary voyages.³ In short, humanity seems to aim at a form of colonization of the space closest to our planet, in order to deepen its investigation of the earth, to increase the contribution of space research to the economy (new technologies characterized by ever-higher levels of precision, compactness, lightness, dependability and durability), to safeguard the balance of nature, and to

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¹The American space program for the next decade is oriented in this direction. See *New Adventures in Space*, U.S. News and World Report, July 16, 1979, p. 33; Wilford, *Ten Years After the Moon, Many Systems Are Still Go*, N.Y. Times, July 22, 1979, Sec. 4, p. 20, col. 1; *Clouds Over The Space Program*, Time, July 16, 1979, p. 24.

²The U.S. has perfected a system for placing satellites and other vehicles in extra-terrestrial orbit at contained costs: this is the Space Shuttle (whose use may begin as early as next year) which would be able to take off toward the designated orbit and return to Earth, landing like a glider. In other words, instead of an entire rocket being destroyed for each launching, only the necessary fuel would be spent, and the Shuttle would be reused for several more launchings. See generally J. Grey, *Enterprise: The Use of the Shuttle in Our Future Space Programs* (1979).

³See Fyodorov, *The Use of Outer Space and Interests of Nations*, Int. Aff. (Moscow), July 1978, p. 12; Oberg, *Red Star In Orbit*, Omni, May 1979, p. 76.

amplify—through an ever fuller flow of information and communications—experiences which are already common to a very large number of people, enabling them to feel more closely linked to a unique destiny in the “global village” Earth.

Some of these projects have a clear potential for use for military purposes, while certain recent incidents⁴ have reopened questions on the criteria followed to guarantee the protection of Earth’s population and environment. However, it is the military aspect which is arousing the greatest apprehension, because it is feared that this may ultimately add a new and serious dimension to the current arms race.

II. *The United Nations and Outer-Space Activities*

The rapid formation of general rules in force for outer space has been considerably aided by the work of the United Nations whose Committee for the Peaceful Uses of Outer Space has been the main catalyst for international cooperation and regulation in this field for 20 years. Such regulation has been inspired by the principle of the free use of outer space, understood as being for peaceful purposes and conducted in the interests of all humanity (national appropriation of any kind is excluded) and with due regard to the equal rights of States.⁵

The Committee for the Peaceful Uses of Outer Space was established by the United Nations with Resolution 1472/XIV of December 12, 1959. As an intergovernmental body subsidiary to the General Assembly, to which it must present periodic reports, the Committee functions on the basis of the rule of consensus. In 1962, a Scientific and Technical Subcommittee and a Legal Subcommittee were established, to each of which an appropriate division of the U.N. Secretariat provides attentive assistance.⁶ It was in

⁴The fall over Canada of the Soviet nuclear satellite COSMOS 954 (January 1978) and the consequent spread of radioactive fragments led to some reflection on the dangers of the use—currently uncontrolled—of certain space technologies. This first nuclear space “crisis” prompted Canada, Italy and several other countries to put forward at the U.N. an appropriate international ruling (see Italy’s Note on the issue in U.N. Doc. A/AC.105/220 (1978) and the first report of the *ad hoc* working group in Doc. A/AC.105/C.1/L.III (1979). The fall to earth of Skylab in July 1979 with only six hours’ prior notice of the site of impact, reopened the discussion on the responsibility and consequences of the growing use of earth orbits. Currently several thousand vehicles, capable of re-entry at any moment owing to technical defects or other unforeseen causes, revolve around our planet. Here, also, a policy of international “traffic control” and national measures aimed at preventing future similar accidents seem necessary, in the superior interests of humanity.

⁵In general, see Bentivoglio, *Le N.U. e la conquista dello spazio*, *La Comunità Internazionale* 3-4 (1970); *Comm. on Aeronautical and Space Sciences, International Cooperation in Outer Space: A Symposium*, S. Doc. No. 92-57, 92d Cong., 1st Sess. (1971); G. Giuliano, *Diritto Internazionale*, II (1974); P. Jankowitsch, *International Cooperation in Outer Space*, (The Stanley Foundation, 1976); S. Gorove, *Studies in Space Law* (1977); U.N. Office of Public Information, *The United Nations and Outer Space* (1977) [hereinafter *The United Nations and Outer Space*].

⁶For a discussion of this collaboration, see Bentivoglio, *op. cit.*, *supra* note 5 and *The United Nations and Outer Space*, *supra* note 5.

the context of the Legal Subcommittee, and at the behest of the General Assembly, that the relevant international agreements were substantively negotiated.⁷

The Outer Space Committee has not yet succeeded in concluding a precise demarcation between outer space and airspace subject to State sovereignty, nor even a definitive notion of the expression "space object" or of the meaning of "peaceful use" of outer space. However, the U.N.'s work has achieved important results; in particular, four international agreements have been adopted, while a fifth one, concerning the activities of States on the moon and other celestial bodies, was just passed at the last General Assembly.⁸

The Agreement Governing the Activities of States on the Moon was concluded in 1979 after years of fruitless negotiation, mainly because the Soviet Union finally accepted the introduction into the Agreement of the principle, supported by the Third World and until this summer opposed by the U.S.S.R. that the moon's resources are the "common heritage of mankind". The agreement binds the contracting States to elaborate a regime for the equitable allocation of benefits which will result when the commercial exploitation of the moon's resources becomes feasible. Thus it is compromise (the regime of exploitation is conditional upon its commercial feasibility) between the premise of the Third World (which requested an even more binding commitment) and that of the space powers (which favored a bland general principle). The fact remains, however, that this was the introduction, for the first time, of a legal notion ("common heritage of mankind") which in another forum—the U.N. Conference on the Law of the Sea—has not yet been agreed upon with respect to deep-sea resources, inspite of endless negotiations. In addition, the international community—on the basis of the moon agreement—will have to be kept informed of the results of the research and findings of space powers on the moon. The agreement has not exhausted the Committee's activities: other delicate issues, entrusted to it by the General Assembly, remain on its agenda.

The principal topics are: endorsement of the U.N. program for space applications; elaboration of principles for the regulation of future direct television broadcasting via satellite; study of the technical and legal implications of activities involving remote sensing of earth resources from space, and the role of the U.N.; delimitation of outer space; regulation of the use of nuclear-power sources on space vehicles; space transport and implications for future activities in space; and the preparation of the second, U.N. Conference on the Exploration and Peaceful Uses of Space scheduled for 1982. Thus a

⁷This was not an easy task, given the presence of the two great space Powers on both the Committee and its two Subcommittees.

⁸For the Agreement on the Moon, see U.N. Doc. A/SPC/34/L.12 (1979); for the previously adopted instruments—basic Treaty of 1967, Agreement on the Rescue and Return of Astronauts and the Return of Space Objects Convention on Liability for Damages of 1972, Convention on Registration of Space Objects of 1976—see *The United Nations and Outer Space*, *supra* note 5.

full agenda for the XXIII annual session of the Committee in 1980 and, at the same time, an indication of the role which the U.N. is playing as the world forum entrusted to reconcile the special interests of States in order to promote—with a network of legal guidelines in first rank—the participation of all humanity in the benefits of the space era. This is an enterprise of coordination and stimulus, conditional upon effective international reality and the enormous technological gap separating some countries from the rest of the international community, but nonetheless worthwhile, if only for the continual pressure it exerts toward the realization of superior interests of a universal character.

III. *Dangers of a Militarization of Outer Space*

The provisions of international law relating to the use of outer space do not explicitly prescribe demilitarization. Article IV of the basic 1967 Outer Space Treaty limits to the moon and other celestial bodies their use on the part of States “for exclusively peaceful purposes”, while concerning outer space in general, the contracting States, undertake only “not to place in orbit around the earth any object carrying nuclear weapons or any other kind of weapons of mass destruction”, a provision which clearly has left open the possibility of the use of space for a whole range of other activities of a strategic and military nature, such as the use of observation satellites.

On the other hand, from a reading of the general principles incorporated in the treaty, the impression is derived that it contains a general assumption that all outer space activities should be kept peaceful per se inasmuch as they are open to all humanity and are to be “pursued in the interest of all States”. This impression is reinforced by the stress laid on international cooperation and on the scientific exploration of space. In fact, the 1967 Treaty exhibits uniform tendencies and assumes the international community’s substantive commitment of conscience to regulate the matter according to well-determined principles restrictive of the unbridled liberty of States; tendencies, still largely shared, which are aimed mainly at the prohibition of nonpeaceful uses of outer space.

Nevertheless, an explicit agreement on the complete demilitarization of outer space has been made conditional to the larger problem of disarmament. In East and West alike, military programs have been maintained in outer space, aimed at providing, rather than new weapons-systems, support for those already in existence. The use of satellites for military purposes has grown increasingly extensive.⁹

⁹A brief look at the dimensions of the phenomenon may be useful here. The total number of vehicles launched into space by man had reached a 10,791 as of 31 March 1978 (for a breakdown by country, objects in orbit and decayed objects, see Doyle, Reentering Space Objects: Facts and Fiction, 6 J. Space L. 2 (1978). According to the Stockholm Institute for Peace Research (SIPRI) about 60% of all American and Soviet satellites are military. For details, see SIPRI, *Outer Space: Battlefield of the Future* (1978). From the beginning of the space age to the end of 1976, 1386 military satellites had been launched (among them 563 by the U.S. and 899 by the U.S.S.R.), and in 1978 alone, 112 were sent up (19 by the U.S., 91 by the U.S.S.R., 1 by China, and 1 by NATO). For a full discussion and tabulation, see SIPRI, *World Armaments and Disarmament* 4, 257 (1979).

At this point the question arises of whether military space technology, in continual development, can be considered a peaceful activity, that is, compatible with the proclaimed objective of "peaceful use" of outer space. This expression, frequently cited in support of complete demilitarization, nonetheless does not lend itself to uniform interpretations,¹⁰ inasmuch as it implies subjective considerations. It should be viewed perhaps in relation to the general terms of international law whose validity has been extended to outer space since the 1961 general assembly Resolution 1721/XVI. Consequently, for space, as for the deep sea, military activities—not expressly prohibited by Article IV of the 1967 Treaty—are admissible: thus it is compatible with international law and the United Nations Charter to observe and photograph from outer space, as well as to test weapons and missiles (barring the prohibitions set forth in the Moscow Agreement of 1963)¹¹, and to engage in any other military activity which might be justified by article 51 of the U.N. Charter (right of self-defense): such would be, for example, remote-sensing activities from space or military maneuvers designed to prepare a State to respond to attacks. Apart, then, from the other legal aspects of the problem, and passing over the difficulties of distinguished military from nonmilitary uses (a satellite may guide a submarine or a merchant ship), it seems unrealistic to demand the complete exclusion of military space activities in the presence of a continuing nuclear arms race, whose effectiveness—and hence its power of dissuasion—is linked to the support constituted by space systems for tracking and sighting. Even citation of precedents does not seem convincing. On the contrary, it emerges that when the desire was present to exclude military use (as in the Statute which established the International Atomic Energy Agency and the Treaty on Antarctica), such was accomplished without ambiguity: military purposes—even defensive—were deemed incompatible with peaceful ones. This ruling does not, however, appear extendable by analogy into space given the absence, in the 1967 Treaty, of an explicit prohibition of all military activities¹².

These are considerations which clearly cannot serve as an adequate response to the apprehensions of those fearing an extension into outer space of the ever-advancing arms race.¹³

¹⁰D. O'Connell, *International Law* 539 (1965); P. Jankowitsch, *op. cit., supra* note 5 at 22; 15 *Revue de Droit Pénal Militaire et de Droit de la Guerre* 3-4, 370 ff. (1976); R. Gardner, *L'ONU e la Politica Mondiale* 154 ff. (Capelli, 1966).

¹¹The Moscow Agreement bans nuclear-weapons tests in the atmosphere, in space and underwater. For text, see 14 U.S.T. 1313; T.I.A.S. 5433; 480 U.N.T.S. 43.

¹²The following quotation from an American Government source confirms this: "... agreement was reached on the Outer Space Treaty, which did not ban either observation from space, for whatever purpose, or the testing and development of orbital bombardment systems, [but] merely [that] deployment. ..." *Comm. on Aeronautical and Space Sciences, supra* note 5 at 310.

¹³"... worldwide military expenditures have now reached \$410 billion annually ... an increase of 50% in the last two decades. The Third World's share has increased from 4% to 14% ...," see SIPRI *World Armaments and Disarmament, op. cit., supra* note 9.

What is especially feared is the introduction into space of anti-satellite systems with decidedly destabilizing effects.¹⁴ For what we are given to know (understandably, these operations are enveloped in a climate of secrecy), military satellites perform indispensable functions for surveys, for preventive verification¹⁵ of attacks, for the system of guidance and control of strategic weapon systems, for communications and for listening to those of others, and for verification of compliance with arms-limitation agreements. The fundamental role of military satellites received confirmation in the debate in the United States (especially in the Senate) on the extent of the American capacity to verify the scrupulous application by the Soviet Union of the terms of SALT II recently concluded at the Vienna summit meeting.¹⁶

¹⁴*See, e.g.*, "President Carter Expresses Concern Over Outer Space Hostilities", Washington Post, March 10, 1977, Sec. A, p. 11, col. 1; "New Killer Satellites Make Sky-War Possible", N.Y. Times, June 11, 1978, Sec. 4, p. 3, col. 1; "Stop the Arms Race." The Christian Science Monitor, Oct. 31 1978, p. 23, col. 3; "New Adventures in Space," U.S. News and World Report, July 16, 1979, p. 33; SIPRI Outer Space: Battlefield of the Future (1978); Scovill and Tsipis, Can Space Remain a Peaceful Environment? (The Stanley Foundation, 1978); Cybernetic War, Omni, May 1979 at 44; Gen. Hackett *et al.*, The Third World War: August 1985, 202-6 (1975). For an illustration of the military space programs being developed by the U.S. and the U.S.S.R. (including antisatellite weapons), *see* World Armaments and Disarmament *supra* note 9, at 256-79. The issue has been raised on occasion at the U.N. as in the statements of Brazil (25 Nov. 1977), and Japan (22 Nov. 1978) in the First Committee of the General Assembly. Italy's initiatives are discussed in this essay. *See* Appendix, *infra*.

¹⁵As early as SALT I (1972), the conclusion was reached that both sides should respect "national technical means of verification." President Carter officially took the position on October 3, 1978 that observation satellites had become an important factor for stability in world affairs, and that they could make an immense contribution to the security of all countries by monitoring arms-limitation agreements. "We will continue to use them". Secretary of State Vance reiterated this position in his statement before the Senate Foreign Relations Committee on July 10, 1979, stating that negotiations were under way with the Soviet Union for the limitation of anti-satellite weapons in order to protect those vehicles for observation and communications which are *vital* in periods of calm and *indispensable* in times of crisis. *See also* "U.S. Monitoring War Through Space Photos and Radio Intercepts" N.Y. Times, March 1, 1979, Sec. 1, p. 8 col. 1 The U.S. lacking on-site observers, used satellites to monitor the China-Vietnam war. It should be emphasized that in spite of the obvious effectiveness of satellites, such means must be coordinated with other, "terrestrial" ones (on-site inspections, for example) in order to guarantee the full accuracy of data obtained.

¹⁶The Carter Administration's response was positive, even after the loss of its ground-control stations in Iran. American military satellites, according to the media, operate at a height of 100 miles and can photograph the entire Soviet territory in detail so precise as to record the license numbers on street vehicles. In this way it is easy to identify new missile silos, military manoeuvres, activities involving the construction or modification of weapons, radar installations, test launching, etc. Secretary of Defense Brown, ex-CIA Director Colby and ex-ACDA Director Warnke have said they are convinced of the adequacy of satellites and other, earthbound means for the verification of SALT agreements. Colby has added that clearly a single unidentified Soviet missile would not offer the U.S.S.R. a strategic advantage, given the composition of present nuclear arsenals. *See* "How Satellites Help to Sell SALT," U.S. News & World Report, May 21, 1979, p. 21; "SALT Verification and Iran", Arms Control Today, Feb. 2, 1979; "The SALT Debate: Why We Don't Need Iran," New York, June 18, 1979, p. 41; "Spies in the Sky", Time, July 30, 1979, p. 30; "Verification of SALT II Agreement", U.S. Dept. of State, Special Report No. 56. (August 1979).

In this light, the American proposal to the Soviet Union to begin talks for the limitation of anti-satellite weapons in order to "prevent an arms race in space and to limit the threat to satellites" is hardly surprising. Such talks were then initiated in Helsinki in June 1978 and are still in progress. In official American documents¹⁷ it is confirmed that the U.S.S.R. has developed an anti-satellite system (ASAT); the United States would prefer—rather than to respond with analogous weapon systems—to undertake negotiations aimed at integrating the relevant clauses of SALT I and II (ban on interference with national technical means of verification, including observation and reconnaissance satellites), for example, through the prohibition of attacks on satellites and the limitation of anti-satellite systems. The minimum objective of the American negotiators would be a moratorium on anti-satellite weapons.¹⁸ An agreement seemed imminent on the eve of the Vienna summit meeting¹⁹ but was not achieved because the Soviets would have desired a moratorium on the use of the (American) Space Shuttle, potentially capable of carrying out anti-satellite operations.²⁰ The negotiations are proceeding nonetheless.²¹

The American initiative was considered a step in the right direction even by those who would like to arrive at a complete demilitarization and neutralization of outer space. If this last objective seems unrealistic—or even inappropriate, at the present world juncture—in the light of international security (there exist on earth no means alternative to satellites and equally effective for the observation and reconnaissance of military activities), one may well consider, from this point on, initiatives more ambitious than the American one; that is, which respond more fully to the basic goal of ensuring strictly peaceful and nonhostile uses of space.

It is in this context that the Italian initiative of March 1979 takes root as will be shown in ensuing discussion. It will also be useful to recall, for the record, the recent French proposal (supported by Italy from the outset) for the creation at the United Nations of a world satellite-monitoring agency, a proposal aimed clearly at bringing the use of space technology into a multilateral framework in order to place it at the service of

¹⁷See the Annual Report for 1978 of the Arms Control and Disarmament Agency (ACDA), pp. 73-74.

¹⁸See "U.S. Seeks to Curb Killer-Satellites," N.Y. Times, April 10, 1979, Sec. 1, p. 1, col. 4.

¹⁹See "Soviet and U.S. Agree on Agenda, for Brezhnev-Carter conference" N.Y. Times, June 9, 1979, Sec. 1, p. 3, col. 1, which asserts the possible signing of an agreement on anti-satellite weapons in conjunction with SALT II.

²⁰See "Soviets Said to Ask Space Shuttle Halt," N.Y. Times, June 1, 1979, Sec. 1, p. 6, col. 1; "U.S. Abandons Hopes of Signing More Accords at Vienna Meeting," N.Y. Times, June 9, 1979, Sec. 1, p. 3, col. 1; the United States would have recognized that the Space Shuttle could also be used to place military satellites into orbit, but excluded the possibility of its use against the satellites of another State.

²¹Secretary of State Vance declared as much in his statement before the Senate on July 10, 1979, *supra* note 15.

the United Nations in the interest of peace, so as, for example, to ascertain facts objectively or to be able to make use of a modern global system of communications in case of crisis.²²

IV. Italy's Initiative for an Exclusively Peaceful Use of Space (March 1979)

Italy has always favored the exclusively peaceful use of outer space.²³ Paragraph 80 of the "Programme of Action", set forth in the Final Document of the Special Session of the United Nations General Assembly devoted to disarmament (May-June 1978) and introduced there at the suggestion of the Italian and other delegations, states: "In order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit of the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies."

Recalling the gaps in Article IV of the 1967 Treaty (it covers nuclear weapons and other weapons of mass destruction, but not all weapons), and the dangers of a placement in space of weapons other than those barred in the Treaty, Italy sought to offer a concrete contribution of ideas for the fulfilment of the recommendation cited above, by introducing (in the Committee on Disarmament in Geneva) a draft Additional Protocol to the 1967 Treaty, along with an explanatory memorandum, a document which is reproduced in the Appendix below. What Italy proposed was a new agreement which would prohibit:

²²France's initiative was incorporated in Resolution 71/XXXIII of Dec. 14, 1978, cosponsored by Italy, which entrusted a group of Government experts (including one from Italy) to elaborate a study on the technical, legal and financial implications of the possible creation of an International Disarmament Monitoring Agency that would utilize observation satellites. The group's preliminary report was presented to the XXXIVth General Assembly on September 14, 1979 (Doc. SMA/WP/5) with essentially positive conclusions regarding the feasibility of the project: the Agency, according to the report, should be able to have full independence and to count on the support of States which already make use of space technology further studies are also needed. The position taken by the United States on this issue in its note to the U.N. Secretary-General, dated April 12, 1979, deserves to be noted with the observation that the Soviet Union's attitude is similar. In brief, the U.S. does not consider the project feasible in the foreseeable future; among examples cited were the insurmountable difficulties that would arise in the attempt to conciliate future decisions of the Agency with conclusions reached in a national context regarding a certain fact or an alleged violation of a disarmament agreement, to say nothing of the total cost of the venture, which would level the entire budget of the United Nations. Italy recognizes these problems and others, but has maintained a chiefly positive attitude toward the French proposal, which it views as a first step or possible component of a broader design (Italy did propose—in the framework of a global program or strategy for disarmament—the establishment of an Agency to verify disarmament accords).

²³With other Western powers, Italy proposed to the Committee on Disarmament on March 16, 1960 (Doc. TNCD/3) a ban on weapons of mass destruction in outer space. In 1968, it proposed at the U.N. a review of Article IV of the 1967 Treaty (Doc. A/7221 of September 9, 1968). More recently, it has proposed a series of measures, among them further steps to prevent an arms race in outer space (working paper A/AC.187/97 of 1978 introduced in both Geneva and New York). This suggestion was accepted, and forms the basis of paragraph 80 of the Programme of Action continued in the Final Document of the Xth, Special Session of the U.N. General Assembly devoted to disarmament.

a) the testing, introduction or use of any system—based either on earth or in space—aimed at damaging, destroying or interfering with the operation of any space object;

b) the placing into earth orbit, on celestial bodies including the moon, or elsewhere in space, of any kind of offensive weapon; in particular, of those capable of use for hostile purposes against the earth, the atmosphere, or space objects.

In addition, the memorandum proposes the establishment of international mechanisms (in the context of the United Nations) which would make it possible to strengthen present verification systems, facilitate the prevention of false alarms, improve registration at the U.N. of data on space launchings and deepen international cooperation, as envisaged in the 1967 Treaty.

In other words, the draft Additional Protocol would complete the present regime in force by extending the ban—stipulated in Article IV of the Treaty—to include a prohibition on the placing in space (in earth orbit or elsewhere) of *all armaments*, not just nuclear weapons and other weapons of mass destruction. It would also ban all activities aimed at harming or destroying the satellites of another State or interfering with their operation. In this way the complete protection of all space systems would be guaranteed, while at the same time the introduction or testing in space of a device of any degree whatsoever of offensive capability would be forbidden,²⁴ so that the assured invulnerability of space objects would not serve paradoxically to mask or facilitate the deployment of new weapons. Needless to say, exception would be made in the case of observation and reconnaissance satellites, for their obvious utility in the maintenance of peace and international security, and more generally, in the case of any space systems intended to strengthen strategic stability, ensuring *inter alia* the verification of disarmament and arms-limitation agreements, as indicated in the memorandum.

The goal of the exclusively peaceful use of outer space would be further guaranteed if verification systems could be strengthened on a parallel with the creation of mechanisms of international control,²⁵ in such a way as to prevent false alarms and allay suspicions. This is a task which would be greatly facilitated by an increased openness regarding military activities in outer space.²⁶ It may in fact be predicted that a perfectly legitimate activity—military, peaceful or civilian—might be viewed otherwise by a third

²⁴The difficulty of defining the expression "offensive device" must not be underestimated. In the first instance, one may assume that all military space activities constituting hostile acts should be banned. The hostile intention might be determined case by case parallel with similar situations on Earth.

²⁵The previously mentioned International Agency for the use of observation satellites might serve as the first step towards the establishment of a U.N. Agency for the verification of disarmament measures, see *supra* note 22.

²⁶For example, more data on launchings and objectives of space missions might be provided to the United Nations office at which outer space vehicles are registered.

State.²⁷ from which might arise also the necessity to proceed as soon as possible from the current bilateral talks between the United States and the Soviet Union on anti-satellite weapons to a multilateral negotiation, both because the issues are of universal concern and in order to prevent in the meantime, third States from insisting upon having to initiate programmes similar to those under consideration for a ban by the two greatest outer space powers.²⁸

V. Initial Developments

The Committee on Disarmament (COD) of Geneva, to which the Italian document was submitted on March 26, 1979²⁹, was absorbed in that session by endless discussions on the definition of its program of work and rules of procedure. In 1979, the Italian proposal was taken into consideration in that forum only in the light of its placement in the context of an agenda covering all the disarmament issues, and was finally included among collateral measures. The Committee subsequently decided (see paragraph 21 of document CD/53, dated August 14, 1979) to confront certain issues—among them, the prevention of the arms race in outer space—at an appropriate stage of its work.

From May 14 to June 8, 1979 the first substantive session of the newly reconstituted United Nations Disarmament Commission (UNDC), entrusted with the priority function of elaborating elements to be included in a comprehensive disarmament program, was held in New York. On that occasion Italy, illustrating on May 15, 1979 a sheaf of proposals, recalled its Geneva initiative in favor of the exclusively peaceful use of outer space. The response was largely positive,³⁰ and the main Western countries, along with Italy, included that specific question in a working paper jointly introduced at the session.³¹ The Commission finally adopted by consensus its report to the General Assembly incorporated in document A/34/42 in which appear the structure and elements of a comprehensive disarmament program, including the issue of the prevention of an arms race in outer space.

²⁷*E.g.*, a Laser beam, used in a solar powered satellite as a means of transmitting solar energy to power centers on Earth, might be viewed instead as an anti-satellite or anti-missile weapon.

²⁸*E.g.*, China might interpret Soviet programs for the development of anti-satellite weapons as intended to "neutralize" Chinese space systems, and then react accordingly.

²⁹Following submission of the document, which was given the symbol CD/9, the Italian delegate illustrated it in statements given on March 27, 1979 and April 24, 1979. For text of the document, see Appendix, *infra*.

³⁰For instance the Austrian representative, referring to the "disturbing phenomenon of the proliferation of the arms race in outer space", expressed satisfaction over Italy's specific initiative.

³¹Working Paper entitled "Elements of a Comprehensive Disarmament Programme", introduced by the Federal Republic of Germany on behalf of the Western group (Doc. A/CN.10/8).

For further information, it should be recalled that in preparation for the Commission session just mentioned, and in the days immediately preceding it, an international symposium was held outside New York City.³² The Italian draft protocol was favorably received by most participants. Some concern was expressed by the American spokesmen and the delegate from the Eastern European group who, recalling the bilateral talks then in progress between the U.S.A. and the U.S.S.R. considered inopportune the proposal to undertake a multilateral negotiation. The Americans in particular added that it was first necessary to determine more clearly the military space activities to be included in the projected ban specifying, for example, other "passive" (i.e. non-offensive) space objects as distinct from observation and reconnaissance satellites, whose use deserved to be equally safeguarded. The Conference concluded: given the increased rate of development of military space technology, and its serious implications for international peace, many participants maintained that the comprehensive disarmament program should include as a priority issue the "assurance of a peaceful use of outer space". Although the 1967 Treaty does not contemplate an automatic review mechanism, the participants considered such review important; the Conference concluded that it might take the form of a change in Article IV which would ban all weapons and any other device for hostile uses in outer space or the ban might be introduced in an additional protocol to the Treaty.

A further occasion to call attention to the Italian initiative arose a few weeks later at the 22nd session of the U.N. Committee for the Peaceful Uses of Outer Space, held in New York from June 18 to July 3, 1979. Again the reactions were mostly favorable, enabling the following paragraph to be included in the Committee's preliminary draft report to the General Assembly: "The Committee took note of the concern expressed by some delegations on the possible extension of the arms race to outer space. In this connexion, reference was made to the proposal tabled by Italy on 26 March 1979 in the Committee on Disarmament for an additional protocol to the 1967 Treaty. . ."³³ At the

³²Report on the Tenth Annual Conference on United Nations Procedures (10-13 May 1979): 'Comprehensive Programme of Disarmament' (The Stanley Foundation, ISSN 0069-8601, Muscatine, Iowa, 1979). Qualified exponents of all the regional groups at the United Nations, including the Chairman of the U.N. Disarmament Committee took part in the Conference. The open, informal atmosphere allowed the participants to explore in depth the issues under discussion and to clarify points of convergence and divergence, facilitating the official work of the U.N. which began the day after the Conference concluded and in which the author participated as the Italian representative.

³³U.N. Doc. A/AC.105/L.113/Add. 5 (1979).

moment of final approval of this passage, the Soviet delegation—claiming to be without specific instruction on the matter³⁴—opposed it. Once the Soviets' isolation in the Committee became evident, the Italian delegation withdrew the paragraph so as not to break the rule of unanimity which traditionally governs the Committee's work.

VI. *Conclusions: Man In Space*

Man has conquered outer space. Wondrous devices have been launched to dizzying heights. Surpassing all the possible limits of fantasy, the mysteries of the universe are being sounded and a planetary vision of humanity and its problems is being born. The latest adventure of the technological era, though, has not given us new men, or new obligations, on a parallel with the new powers of science.

With the industrial revolution, and the resultant symbiosis of science and technology, science runs the risk of losing its soul. Increasingly enslaved to the logic of profit of the materialistic society, science produces new and sophisticated instruments rendering possible the destructiveness which, more or less revealed or hidden, is materializing and molding our moment in history. The growing involvement of men of science in the military sector and the generalized arms race are proof of this.

The astronauts' vision of the Earth as a "global village", seen at a vast physical distance from our planet, marked a historic turning-point whose implications, even spiritual, we do not yet fully understand.

The boundless horizons of outer space open upon a future rich with both promise and hidden danger, offering man the possibility to make his long-awaited qualitative leap forward. To prepare for such a breakthrough, science must reclaim a human dimension, collective solidarity must prevail against the logic of power and earthly conquest. Italy's proposal to guarantee exclusively peaceful activities in outer space is an act of faith in the creative potential of human beings. It is the belief in a dialogue which may enshrine in international law the noblest aspirations of our species.

³⁴The impression gathered, however, was that the U.S.S.R. had carefully studied the entire issue, and especially the potential military use of the Space Shuttle. At the request of the Soviets, paragraph 43 of the Committee's report (Doc: A/34/20, previously cited) states that the opinion was expressed (by the Soviet Union) that it would be necessary to elaborate legal principles to regulate (future) space transport, bearing in mind—*inter alia*—the prohibition to remove from space the objects of another (launching) State without its prior consent, as well as to proceed to the elaboration of rules for the transit of space transport systems over the territory of foreign countries after the first launching phase. The United States added to the same paragraph the statement that all these aspects refer to any type of space transport vehicle, and it is on such basis that possible future discussions will be able to take place.

ITALY

Additional Protocol to the 1967 Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies" with a view to Preventing an Arms Race in Outer Space.

MEMORANDUM

I. Paragraph 80 of the "Programme of Action" contained in the Final Document of the Tenth Special Session of the General Assembly of the United Nations devoted to disarmament states:

"In order to prevent an arms race in outer space, further measures should be taken and appropriate international negotiations held in accordance with the spirit 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."

Article IV of the Outer Space Treaty, which is of particular importance to the pursuit of peace and disarmament, provides that:

"States Parties to the Treaty undertake not to place in orbit around the Earth any objects carrying nuclear weapons or any other kinds of weapons of mass destruction, install such weapons on celestial bodies, or station such weapons in outer space in any other manner. The moon and other celestial bodies shall be used by all States Parties to the Treaty exclusively for peaceful purposes. The establishment of military bases, installations and fortifications, the testing of any type of weapons and the conduct of military manoeuvres on celestial bodies shall be forbidden. The use of military personnel for scientific research or for any other peaceful purposes shall not be prohibited. The use of any equipment or facility necessary for peaceful exploration of the moon and other celestial bodies shall also not be prohibited."

The obligation assumed in conformity with the first paragraph of Article IV by States Parties to the Treaty is in the common interest of mankind and, in particular, represents a common defense against nuclear proliferation. Furthermore, it establishes a link with the Treaty Banning Nuclear Weapons Tests in the Atmosphere, in Outer Space and Under Water, which was signed in Moscow on 5 August 1963.

The second paragraph of Article IV clarifies the scope of the words "exclusively for peaceful purposes." It establishes a dual legal regime: the first one provides for complete demilitarization of celestial bodies (without prejudice to peaceful uses), the second one imposes a ban, limited only to nuclear and other weapons of mass

*Taken from Doc. CD/9 (26 March 1979) introduced by Italy in the Committee on Disarmament in Geneva.

destruction, on military activities in orbits around the earth and in outer space, although it could be argued that the combined provisions of Articles I and IV imply a commitment to the total ban of an arms race in outer space. Furthermore, the text of the Treaty does not state clearly that the moon is a celestial body.

II. The 1967 Treaty explicitly calls for international cooperation and scientific exploration of outer space. Indeed, its main purpose is to promote the exclusively peaceful use of outer space in the common interest of all mankind. For more than a decade the implementation of the Treaty has contributed to prevent the introduction in outer space of nuclear arms race. Recent developments in space technology, in particular the development of interceptor/destroyer satellites, and the possible use in outer space of weapons not specifically prohibited by Article IV suggest the need to supplement the existing legal system with specific provisions. Indeed, it seems advisable, in the interest of international security, to impose a total ban on military activities other than peaceful, in outer space because of the danger of the development of offensive outer space weapons, such as the so-called hunter-killer satellites, which would add a new, more serious dimension to the arms race. Needless to say, the use of reconnaissance, surveillance and communications satellites, and indeed, of any space system which would reinforce the strategic stability by ensuring, *inter alia*, the verification of disarmament and other arms limitation agreements will not be prejudiced. Therefore it would be advisable to review, even on a limited basis, the regime established by the Treaty of 1967 in order to prohibit, *inter alia*, the development and use of earth or space-based systems designed to damage, destroy or interfere with the operations of other States' satellites. Such a ban could be embodied in an Additional Protocol to the Treaty of 1967, extending the prohibition contained in Article IV thereof explicitly to the launching and the stationing in orbit or elsewhere in outer space of all weapons, and not merely of nuclear and mass destruction weapons. Were this not to be done, the protection accorded to all space systems could, paradoxically, permit the introduction of offensive space devices other than those prohibited by Article IV of the Outer Space Treaty.

At the same time we should strengthen existing technical means of verification and lay the basis for a wider involvement of the international community in such of the General Assembly of the United Nations by the adoption of a proposal, introduced by France and which Italy was happy to co-sponsor, for the establishment of an International Satellite Monitoring Agency.

In the view of the Italian Government the problem of military uses and of the prevention of the arms race in outer space falls within the competence of the negotiating multilateral disarmament forum established in Geneva. Such a problem should therefore be dealt with by the Committee on Disarmament at the earliest appropriate time.

The danger of an arms race in outer space and the importance of satellites for the verification of arms control agreements justify its consideration under the terms of reference of the Committee on Disarmament in Geneva.

III. Italy has always been in favour of the use of outer space exclusively for peaceful purposes.

Since 9 September 1968, the Italian delegation proposed to the United Nations to review Article IV of the Treaty of 1967 (Doc. A/7221). On 1 February 1978, both in New York and Geneva, Italy proposed the adoption of further measures to prevent the extension of the arms race (Working Paper A/AC.187/97). This suggestion is reflected in paragraph 80 of the Programme of Action of the Final Act of the Special Session on Disarmament.

The Italian Government, in submitting this Memorandum to the Committee on Disarmament, hopes that it will be favourably received and make an effective contribution to the elaboration, at an appropriate stage, of timely measures to ensure the practical application of paragraph 80.

In supplementing the rules of the 1967 Treaty, pertinent provisions of the Convention on the prohibition of military and any other hostile use of environmental modification techniques should—in the view of the Italian delegation—be also kept in mind.

Attached to this Memorandum is a draft Additional Protocol to the Outer Space Treaty which Italy has elaborated with the aim to provide a concrete basis of discussion in the proceedings of the Committee on Disarmament.

ANNEX I

Additional Protocol to the Treaty on Principles governing the Activities of States in the Exploration and Use of Outer Space including the Moon and Other Celestial Bodies.

The high contracting Parties

- recalling* the need to facilitate, in the interest of all mankind, the exploration and use of Outer Space for exclusively peaceful purposes;
- considering* the urgent need of adopting further effective measures aimed at preventing an arms race in outer space;
- noting* the necessity to supplement 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 of 27 January 1967;
- stressing the importance* of the latest technological developments for the effective implementation of the principles mentioned in article 1 of the Treaty;
- convinced* of the opportunity to prevent any development that might jeopardize the achievement of the aims of the Treaty;

—*taking note* of paragraph 80 of the Final Document adopted by consensus at the Tenth Special Session of the General Assembly of the United Nations devoted to Disarmament;

have agreed on the following:

ARTICLE I

1. Outer space, including the moon and other celestial bodies, shall be used for peaceful purposes only. States Parties to this Protocol undertake to refrain from engaging in, encouraging or authorizing, directly or indirectly, or in any way participating in any measures of a military or other hostile nature, such as the establishment of military bases, installations and fortifications, the stationing of devices having the same effect, the launching into earth orbit or beyond of objects carrying weapons of mass destruction or any other types of devices designed for offensive purposes, the conduct of military manoeuvres, as well as the testing of any type of weapons.

2. The provisions of this Protocol shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purposes as well as the use of such personnel or equipment for the purpose of participating in any control system to be established in order to ensure compliance with disarmament and security agreements.

ARTICLE II

Each State Party to this Protocol undertakes to adopt any measures it considers necessary in accordance with its constitutional processes to prohibit and prevent any activity in violation of the provisions of the Protocol anywhere under its jurisdiction or control.

ARTICLE III

1. Any State Party to this Protocol which has reason to believe that any other State Party is acting in breach of obligations deriving from the provisions of the Protocol may lodge a complaint with the Security Council of the United Nations. Such a complaint should include all relevant informations as well as all possible evidence supporting its validity.

2. Each State Party to this Protocol undertakes to cooperate in carrying out any investigation which the Security Council may initiate, in accordance with the provisions of the Charter of the United Nations, on the basis of the complaint received by the Council. The Security Council shall inform the States Parties of the result of the investigation.

3. Each State Party to this Protocol undertakes to provide or support assistance, in accordance with the provisions of the Charter of the United Nations, to any State Party which so requests, if the Security Council decides that such Party has been harmed or is likely to be harmed as a result of violation of the Protocol.

ARTICLE IV

This Protocol shall be of unlimited duration.

ARTICLE V

1. This Protocol shall be open for signature to all the Parties 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. Any State which does not sign it before its entry into force may accede to it at any time;

2. This Protocol shall be subject to ratification by signatory States. Instruments of ratification or accession shall be deposited with the Governments of the United States of America, the United Kingdom of Great Britain and Northern Ireland and the Union of Soviet Socialist Republics in their capacity of Depositaries of the Treaty;

3. This Protocol shall enter into force upon the deposit of instruments of ratification by Governments;

4. For those States whose instruments of ratification or accession are deposited after the entry into force of this Protocol, it shall enter into force on the date of the deposit of their instruments of ratification or accession;

5. The Depositaries shall promptly inform all signatory and acceding States of the date of each signature, the date of deposit of each instrument of ratification or accession and the date of the entry into force of this Protocol, as well as of the receipt of other notices;

6. This Protocol shall be registered by the Depositaries in accordance with Article 102 of the Charter of the United Nations.

ARTICLE VI

This Protocol of which the English, Arabic, Chinese, French, Russian and Spanish texts are equally authentic, shall be deposited in the archives of the Depositary Governments, who shall send duly certified copies thereof to the Governments of the signatory and acceding States.

I.

REPORT OF THE WORKING GROUP ON THE USE OF NUCLEAR POWER SOURCES IN OUTER SPACE ON THE WORK OF ITS SECOND SESSION*

1. The Working Group on the Use of Nuclear Power Sources in Outer Space, established by the Scientific and Technical Sub-Committee in accordance with General Assembly resolution 33/16 of 10 November 1978 (para. 8) to consider the technical aspects and safety measures relating to the use of nuclear power sources (NPS) in outer space, held its second session at United Nations Headquarters from 28 January to 12 February 1980. Professor J. H. Carver (Australia) served as its Chairman.

2. The Working Group held eight formal meetings and, in addition, a number of closed informal meetings. A list of experts who attended the Working Group is annexed (annex I).

3. The Working Group had before it working papers presented by Japan (A/AC.105/C.1/WG.V/L.5), Sweden (A/AC.105/C.1/WG.V/L.6), Canada (A/AC.105/C.1/WG.V/L.7 and Add. 1 and L.14), United States of America (A/AC.105/C.1/WG.V/L.8 and L.9), Union of Soviet Socialist Republics (A/AC.105/C.1/WG.V/L.10), United Kingdom of Great Britain and Northern Ireland (A/AC.105/C.1/WG.V/L.11 and Add.1), India (A/AC.105/C.1/WG.V/L.12), and France (A/AC.105/C.1/WG.V/L.13). A full list of these working papers is annexed (annex II).

4. At its first meeting, the Working Group agreed to discuss the following items: (a) elaboration of an inventory of the safety problems involved in the use of NPS in outer space; (b) implementation of the International Commission on Radiological Protection (ICRP) recommendations for populations and the environment in the context of space vehicles utilizing NPS; (c) evaluation of existing methods in understanding orbital mechanics to determine if improvements may be made in predicting re-entry phenomena, and (d) definition of technical considerations with regard to a format for notification.

5. The Working Group agreed that its consideration of the item at the present session should be a continuation of the discussion reflected in the report of the first session (A/AC.105/238, annex II).

*Taken from the Report of the Scientific and Technical Sub-Committee of the U.N. Comm. on the Peaceful Uses of Outer Space, Doc. A/AC.105/267, Annex II (1980). The Appendices are omitted.

A. Elaboration of an inventory of the safety problems involved in the use of nuclear power sources in outer space

6. The Working Group noted that, starting with the pre-launch phase, a variety of safety measures should be carefully considered in each phase of the operation of space vehicles with NPS on board. In this connexion, the Working Group had before it a list of safety problems that might be involved in the use of NPS in outer space (A/AC.105/C.1/WG.V/L.5, annex I, pp. 3-6). Some delegations believed that a comprehensive list of this type should be generated by the Working Group. Other delegations considered that compiling such a list was beyond the mandate of the Working Group.

7. The Working Group noted that even a highly reliable system should be subjected by the launching State to a detailed safety evaluation including accident probability analysis in order to assess the risk of using a NPS in space. In this connexion, the Working Group was informed by States launching space vehicles with NPS that they are following their own guidelines with the objective of assuring their safety. Such technical guidelines are outlined in documents A/AC.105/C.1/WG.V/L.8 and L.10.

B. Implementation of the ICRP recommendations for populations and the environment in the context of space vehicles utilizing NPS

8. The Working Group reaffirmed the agreement expressed at its first session that appropriate measures for adequate radiation protection during all phases of an orbital mission of a space vehicle with a NPS-launch, parking orbit, operational orbit or re-entry—should be derived principally from the existing and internationally recognized basic standards recommended by ICRP, particularly as contained in ICRP publication 26.

9. The Working Group noted that the recommendations contained in ICRP publication 26 were intended to provide "the fundamental principles upon which appropriate radiation protection measures can be based" whereas "detailed guidance on the application of its recommendations, either in regulations or in codes of practice, should be elaborated by the various international and national bodies that are familiar with what is best for their needs" (para. 5).

10. Since radiation protection problems which might arise before launching a NPS are covered by the ordinary radiation protection regulations of the States concerned, guidelines based on the ICRP recommendations are needed for use by launching States principally for launching, operation in space, and re-entry.

11. The Working Group took particular note of the ICRP recommendations contained in paragraph 12, which are as follows:

"(a) No practice shall be adopted unless its introduction produces a positive net benefit;

"(b) All exposures shall be kept as low as reasonably achievable, economic and social factors being taken into account; and

"(c) The dose equivalent to individuals shall not exceed the limits recommended for the appropriate circumstances by the Commission."

It was recognized by some delegations that a careful analysis of these issues should be undertaken by the launching States prior to the use of NPS in space. The Working group felt that the results of such an analysis should be communicated to other States to the extent feasible. In this connexion, some delegations stated that their understanding of the above provision would be that a launching State shall communicate to other States the results of such analysis when in its opinion they could be of practical use.

12. With regard to the ICRP recommendation concerning dose limits, the Working Group agreed that, in each case prior to launch, an assessment of the collective and individual dose equivalent commitments must be carried out for all planned phases of a space mission with a NPS. Appropriate guidelines are provided in ICRP publication 26, paragraphs 129 to 132, on exposure of populations. In this connexion, the Working Group noted that ICRP publication 26 recommends an annual dose equivalent limit for workers of 50 mSv (5 rem) whole body dose (or equivalent doses to parts of the body) and an annual dose equivalent limit for the most highly exposed members of the public (the critical group) of 5 mSv from all manmade sources. The Working Group recommended that these limits should not be exceeded during any phase of a NPS mission.

13. The Working Group noted paragraph 220 of ICRP publication 26 which deals with the release of radioactive material into the environment and paragraph 222 which deals with the nature and the physical and chemical forms of radioactive materials. The Working Group took particular note of the concept contained in paragraph 220 that the restriction of the exposure depends on "appropriate arrangements for reducing the probability of accidents giving rise to the releases of radioactive materials into the environment and for limiting the magnitude of these releases, should they occur". It also took note of the effort made to quantify, through probability analyses, the radiological risks inherent in using NPS in space missions (A/AC.105/C.1/WG.V/L.11 and Add.1). This study showed that, in some possible accident situations, the dose limits of ICRP publication 26 could be exceeded. Some delegations considered that internationally agreed guidelines to deal with these issues should be developed.

14. The Working Group reaffirmed the statement previously agreed upon in paragraph 15 of the report on its first session (A/AC.105/238, annex II). The Working Group noted the results of a study (A/AC.105/C.1/WG.V/L.7) which indicate, as an example, that for U 235 fuelled reactors, the fission product activity at 400 years after shutdown is reduced to about 1/1000th of the amount at one year after shutdown.

15. In this connexion, given a situation in which achieving a sufficiently high orbit to enable radioactive decay prior to re-entry depends on boosting the NPS from a lower orbit, the Working Group noted the information contained in the study on the dynamics of space objects (A/AC.105/259 and Add. 1). This analysis highlighted, in particular, the need for sufficient energy, propellant and control to be available to achieve the higher orbit. The Working Group noted that this might be ensured, for example, by having enough reserve fuel on board the original vehicle, by installing an extra booster system or by utilizing an independent vehicle. The Working Group also noted that some means of retrieving the NPS after an adequate cooling time would also be helpful in protecting the environment.

C. Evaluation of existing methods in understanding orbital mechanics to determine if improvements may be made in predicting re-entry phenomena

16. The Working Group noted that, as stated in its conclusions in paragraphs 20 to 25 of the report on its first session (A/AC.105/238), the prediction of satellite life-times and re-entry paths remains at best an inexact science. However, it welcomed the coordinated efforts necessary to improve existing methods of predicting life-times and re-entry paths of satellites.

17. In this connexion, the Working Group welcomed the studies that had been carried out and presented to the Working Group pursuant to the request made in paragraph 25 of the above report. On the basis of these studies, the Working Group determined that substantial improvements in predicting the life-times of space objects can only be achieved if solar activity and, consequently, atmospheric density predictions can be improved. The Working Group recognized, however, that the above studies also indicate that no major improvements in such predictions can be made in the near future and that improvements or additions to the tracking network itself will improve long-term orbital predictions only marginally.

18. The Working Group further recognized that short-term predictions of re-entry trajectories might be further improved through augmented tracking networks.

D. Definition of technical considerations with regard to a format for notification

19. The Working Group agreed that it is the responsibility of those States which launch space vehicles utilizing NPS to conduct safety tests and evaluations.

20. Some delegations considered that these tests and evaluations should be consistent with international safety standards to assure the international community that NPS can be utilized safely.

21. Those delegations also considered that launching States should provide the Secretary-General of the United Nations with generic design data, safety test data, and information pertaining to primary and back-up devices, systems and procedures.

22. Those delegations also considered that, when the launching State is in a position to predict with reasonable certainty that a particular space vehicle utilizing a NPS will be re-entering the atmosphere, the launching State should provide to the Secretary-General, for transmission to Member States, information relating to the re-entering vehicle in addition to that provided under the Convention on Registration of Objects Launched into Outer Space. The purpose of this additional information would be to enable Member States to make their own assessment of the likelihood and consequences of a particular re-entry into the atmosphere and to carry out preparations as necessary for search and recovery efforts and the protection of their own people. In the view of those delegations, this information should include complete updated osculating orbital parameters as well as information on the nuclear power source used and, in particular, the type of NPS (radioisotopic/reactor); structure and materials of components of NPS; radioisotopic inventory at time of re-entry and in the case of reactors, the power operating history; quantity and type of other chemically toxic materials; materials which may produce activation products; chemical composition, form, size, and mass of nuclear fuel or radioisotope; radiation dose rate at one metre for those packages that may survive re-entry, and identification of packages containing radioactive materials. Those delegations also believed that the launching State should provide information required for prediction of trajectory, information to aid in tracking spacecraft and forecasting orbit trajectory, lifetime and impact region. A more complete list of elements to be included in this information is contained in document A/AC.105/WG.V/L.14.

23. Other delegations were of the opinion that the scope of information that a launching State may be required to provide in case of an unplanned re-entry of its space object utilizing a NPS should be dependent on the specific circumstances of such a re-entry and the nature of the NPS used. These delegations considered that, if a malfunction is discovered on board a space vehicle utilizing NPS, thereby causing a risk of accidental re-entry of radioactive materials to the earth, the launching State should so inform other States on whose territory such re-entry is most likely to occur. They also felt that when there is a danger of unplanned re-entry to the earth of radioactive materials contained in a space vehicle with NPS on board, the launching State should be ready to extend the necessary technical assistance of its experts and equipment upon request of any State on whose territory such materials might be discovered.

24. Some delegations expressed the view that there is a technical necessity for a launching State to inform of its launch of a NPS at the time of launch because (a) this would facilitate proper handling of any radioactive materials recovered from a malfunction occurring during the ascent phases of placing the space vehicle into orbit, and (b) this would enable the international community to assess the over-all risk posed by NPS in earth orbits.

25. Other delegations did not agree with this view, since they did not consider that providing such information would be technically or practically justified.

Conclusions and recommendations

26. On the basis of studies submitted in response to the request in its first report, the Working Group reaffirmed its conclusion that NPS can be used safely in space provided that all necessary safety requirements are met.

27. The Working Group agreed that study should continue on the following subject areas:

- (a) Elaboration of an inventory of the safety problems involved in the use of NPS in outer space;
- (b) Implementation of ICRP recommendations for populations and the environment in the context of space vehicles utilizing NPS;
- (c) Evaluation of existing methods in understanding orbital mechanics to determine if improvements may be made in predicting re-entry phenomena;
- (d) Definition of technical considerations with regard to a format for notification.

The work should be carried out on the basis of various studies which have been submitted (see para. 3 above) and others that may be undertaken in the next year. Some delegations felt that further study should also be given to the development of guidelines for the safe design of NPS and for evaluating the acceptability of the radiological risk of NPS in space vehicles.

28. The Working Group recommended that, at the eighteenth session of the Scientific and Sub-Committee, arrangements be made for the Working Group of experts to meet for one week during the Sub-Committee's session to continue its consideration of questions related to the use of NPS in outer space. In this regard, interested members are encouraged to include appropriate experts in their delegations.

29. The Working Group further requested that the Secretariat circulate those studies already submitted plus any new material to Member States in advance of the Sub-Committee's next session.

II.

**REPORT OF THE CHAIRMAN OF THE WORKING GROUP ON
DIRECT TELEVISION BROADCAST SATELLITES***

1. The Sub-Committee, at the first meeting of its present session on 10 March 1980, re-established its Working Group on direct television broadcast satellites to continue its work on the elaboration of draft principles governing the use by states of artificial earth satellites for direct television broadcasting.

2. The Working Group held its first meeting on 11 March and concluded its work on 2 April 1980, having held a total of 14 meetings.

3. The Working Group had before it the report of the Legal Sub-Committee on its eighteenth session in 1979 which contained the eighteenth session report of the Chairman of the Working Group, the texts of the draft principles as they appeared at the conclusion of the eighteenth session, and the working papers submitted at the eighteenth session in the course of the discussions of the Working Group and of the Sub-Committee (A/AC.105/240, annex II and annex IV, sect. B), in particular, the clean text submitted by Canada and Sweden (A/AC.105/C.2/L.117). The texts of the draft principles and working papers are appended to this report. The Working Group also had before it the United Kingdom working paper concerning the World Administrative Radio Conference of 1977 which had been submitted to the Sub-Committee in 1977 (A/AC.105/196, annex IV).

4. The following working papers were submitted at the present session of the Working Group: a working paper, entitled "Consultation and arrangements between States", submitted by the delegation of the United Kingdom (WG/DBS(1980)/WP.1) and a working paper, entitled "Agreements between States", submitted by the delegation of Colombia (WG/DBS(1980)/WP.2). The working papers are appended to this report.

5. Some delegations felt that the Canadian/Swedish working paper, as a whole, could serve as an acceptable basis for an over-all compromise on the set of principles. However, since this feeling was not shared by other delegations, the Working Group decided to begin its work with a discussion of the principles as they appeared at the conclusion of the Working Group's discussion at the eighteenth session of the Sub-Committee (A/AC.105/240, annex II, appendix A). For convenience of reference these texts will be referred to in this report as the texts in document 240. The Working Group decided that the title and preamble of the principles would be considered after the texts of the principles.

*Taken from U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Legal Sub-Committee on the Works of its Nineteenth Session (10 March-3 April 1980), Doc. A/AC.105/271, Annex I (1980). The Appendix is omitted.

6. The views expressed in the course of the discussion are summarized below.

7. *Title.* Some delegations expressed the view that it was important that the expression "international direct television broadcasting" be defined and that the expression "international direct television broadcasting" should also be used in the texts of all the principles.

8. *Preamble. Paragraph 1.* Certain suggestions were made as to the re-drafting of paragraph 1 but no agreement was reached. *Additional paragraph.* The proposal made in 1979 in the Belgian working paper (A/AC.105/C.2/L.120) was considered and received support from some delegations but agreement was not reached. Some delegations expressed the view in respect of paragraph 1(a) of the preamble that direct television broadcasting by artificial earth satellites should be based on respect for the sovereign rights of States and non-interference in internal affairs, and that this principle should be contained in the texts of the principles to be adopted. Other delegations expressed the view in relation to paragraph 1(d) of the preamble that direct television broadcasting by artificial earth satellites should be based on the recognition of the importance of the right of everyone to freedom of expression, including the right to seek, receive and impart information and ideas regardless of frontiers, as enshrined in instruments of the United Nations relating to universal human rights, and that this principle should be contained in the text of principles to be adopted.

9. *Purposes and objectives.* It was suggested that the words "in accordance with the principles set out below and thus" should be included after the words "carried out" in the second line.

10. *Applicability of international law.* Some delegations stated that direct television broadcasting by artificial earth satellites constituted a use of outer space which is subject to a special regime. Other delegations expressed the view that international law, in particular the relevant instruments of ITU, would govern direct television broadcasting by satellites. This principle was not discussed further.

11. *Rights and benefits.* This principle was not discussed.

12. *International co-operation.* The Working Group felt that the proposal made last year by Iraq (WG.II(1979)/WP.4) could be accommodated by including the following provision in the text in document 240: "Special consideration should be given to the needs of developing countries in the use of direct television broadcasting satellites for the purpose of accelerating their national development".

13. *State responsibility.* The Working Group considered the various texts proposed for this principle.

Some delegations expressed their support for the text on State responsibility which is, *inter alia*, contained in the Canadian/Swedish working paper. These delegations recalled that the text was already agreed on in a preliminary manner by the Working Group at previous sessions of the Sub-Committee and reaffirmed the reasons given at previous sessions of the Sub-Committee in favour of the principle. In the view of some delegations, the formulation contained in the Canadian/Swedish working paper was only a reflection of article VI of the 1967 Outer Space Treaty.

Other delegations considered that the principle on State responsibility was not necessary in view of the principle on the applicability of international law which provided for the application of article VI of the Outer Space Treaty as well as of the ITU regulations. Some of these delegations felt that if the principle was not intended to go beyond the scope of article VI of the Outer Space Treaty, the principle would be unnecessary. However, in their view if the principle was intended to go beyond the scope of article VI, it would create serious difficulties and would not be acceptable. According to these delegations, the text of the principle as presently formulated would make a State responsible for certain activities of private entities which responsibility would go beyond existing international law and contrary to national legislation in a number of countries. Some of these delegations considered that if it were decided that there should be a principle of State responsibility, certain qualifying expressions as contained in the proposal made last year by the Netherlands (WG.II(1979)/WP.2/Rev.1) should be included in the principle, namely, the inclusion of the words "in accordance with the applicable rules of international law" after the words "international responsibility".

Other delegations expressed the view that the principle on State responsibility should go beyond the scope of article VI of the Outer Space Treaty and that such an extension of the principle was necessary. These delegations considered that international law required that States should, in certain circumstances, be subject to international obligations. The view was also expressed that activities permissible in one State could be hazardous in another State and that such situations required solution at the international level.

Some delegations were of the opinion that consideration of the principle on State responsibility should be deferred until it could be considered in light of the content of the other principles.

Some delegations felt that a compromise solution may be the inclusion in the principle of a reference to international law in general.

14. *Duty and right to consult.* Some delegations expressed the view that this principle should apply only to a direct television broadcasting service specifically directed at a foreign country. Some delegations felt that the following words "concerning any matter arising from those activities in the field of international direct television broadcasting by satellites" in document 240 should be replaced by the

following words "concerning matters covered by these principles" which appear in the Canadian/Swedish working paper (A/AC.105/C.2/L.117) submitted in 1979. Other delegations preferred the formulation in document 240 as it provided broader possibilities for consultations. Other delegations explained that they preferred the formulation in the Canadian/Swedish working paper since in its scope it is narrower than the formulation contained in document 240.

15. *Peaceful settlement of disputes.* Some delegations spoke in favour of the formulation contained in the words "that may arise from activities in the field of direct television broadcasting by means of artificial satellites" in the text of document 240. Other delegations preferred the more limited formulation contained in the words "that may arise with respect to the interpretation or application of the present principles" in the Netherlands proposal, reflected in a revised form, in paragraph 15 of the Working Group's 1979 report which appears on page 4 of the English text of annex II of document 240. Some delegations proposed that the words "Without prejudice to the procedures provided for in the relevant instruments of the International Telecommunications Union," which appear in the Netherlands proposal should be deleted. Some delegations felt that consideration of this principle should be deferred until after the other principles had been agreed to.

16. *Copyright and neighbouring rights.* It was recalled that the Working Group had agreed last year to the text of this paragraph.

17. *Notification to the United Nations.* The view was expressed that notification procedures already existed under the ITU Regulations and there might be unnecessary duplication if notifications to the Secretary-General of the United Nations were also required.

18. *Consultation and agreements between States.* Some delegations expressed the view that the text of this principle as contained in the Canadian/Swedish working paper (A/AC.105/C.2/L.117) submitted in 1979 was an acceptable compromise formulation balancing the interests of broadcasting and receiving States. Other delegations expressed the view that paragraph 1 of the principle was unnecessary. Some delegations, bearing in mind responses of the ITU representatives to questions put in the Sub-Committee observed that any direct broadcasting service would be legally impossible except under the ITU regulations, and in this context particular reference was made to regulation 6222* (formerly 428A) and the plan for the broadcasting satellite service in the 12Ghz band worked out at WARC 77, as well as to the United Kingdom working paper contained in annex IV of document A/AC.105/196. They also observed that in view of the practical consequences intentional breach of the ITU Regulations was inconceivable.

*Radio Regulation 6222 reads as follows:

"In devising the characteristics of a space station in the broadcasting satellite service, all technical means available shall be used to reduce, to the maximum extent practicable, the radiation over the territory of other countries unless an agreement has been previously reached with such countries."

Those delegations therefore concluded that any principle on consultation and agreements for a direct broadcasting service specifically directed at a foreign State would have to be drafted so as to take into account the above considerations. In this connexion, some of those delegations expressed their support for the reformulation of paragraph 1 of this principle as proposed in the United Kingdom working paper WG/DBS/1980/WP.4. Some delegations, while recognizing the application of the ITU Regulations, were of the view that a principle on consultation and agreements between States should be stated on the political level and was necessary to protect national sovereignty and to preserve cultural identities. Some delegations expressed the view that the ITU Regulations may not cover all aspects and what may seem technically impossible today may not be impossible in the future.

19. In the opinion of some delegations, paragraph 1 of the principle presented serious political and legal difficulties, as it would constitute a derogation from the principle of free flow of information which was a fundamental human right embodied in constitutions and national legislations of a number of countries and reaffirmed in numerous international instruments most recently in the 1978 UNESCO Declaration on the mass media. Some delegations felt that through adherence to the ITU Regulations and by an exchange of programmes, the free flow of information, in this context, would be facilitated. Some delegations expressed support for the proposals made in 1979 in the Belgian working paper (A/AC.105/C.2/L.119) and the United States working paper (A/AC.105/C.2/L.118). Some delegations expressed the view that the principle on consultation and agreements between States was not an infringement of and was compatible with the free flow of information. The view was expressed by some delegations that the 1978 UNESCO Declaration recognized the free flow not of all kinds of information but only of information contributing to the strengthening of peace and international understanding, the promotion of human rights and countering racialism, *apartheid* and incitement to war. They expressed the view that the provisions on the freedom of expression in paragraph 2 of article 19 of the International Covenant on Civil and Political Rights should be read in conjunction with paragraph 3 of article 19 which stated that exercise of the rights provided for in paragraph 2 carries with it special duties and responsibilities.

20. A proposal to reformulate the text of the principle was made by the delegation of Colombia in its working paper (WG/DBS(1980)/WP.2).

21. *Programme content.* Some delegations expressed the view that a principle on programme content was necessary particularly as there was no consensus on the principle on consultation and agreements between States. In this connexion, references were made to the formulation of this principle in document 240. Other delegations were of the view that a principle on programme content was unnecessary and unacceptable. The Working Group was unable to reach agreement.

22. *Unlawful and inadmissible broadcasts.* Some delegations expressed the view that certain broadcasts in particular in contravention of the ITU Regulations and the principles being formulated would be unlawful and inadmissible and therefore relevant formulation was necessary. In this connexion, reference was made to the text in document 240. Some delegations felt that until the other principles had been formulated it was not possible to consider the principle of unlawful and inadmissible broadcasts. Other delegations were of the view that this principle was unnecessary.

23. The Working Group held its final meeting on 2 April 1980 when it considered and approved this report. As agreement at the present session on any further formulation of the texts of the principles could not be reached, the texts of the principles remain as they appeared at the conclusion of the eighteenth session of the Sub-Committee and as contained in document A/AC.105/240.

III.

REPORT OF THE CHAIRMAN OF THE WORKING GROUP ON REMOTE SENSING*

1. The Sub-Committee, at the first meeting of its present session on 10 March 1980, re-established its Working Group on remote sensing.

2. The Working Group noted that the Legal Sub-Committee was required, under paragraph 6 of General Assembly resolution 34/66 of 5 December 1979, to continue as a matter of priority its detailed consideration of the legal implications of remote sensing of the earth from space, with the aim of formulating draft principles relating to remote sensing.

3. The Working Group held its first meeting on 19 March 1980 and concluded its work on 2 April 1980, having held a total of 12 meetings.

4. The Working Group had before it the report of the Legal Sub-Committee on its eighteenth session in 1979 which contained the eighteenth session report of the Chairman of the Working Group, the texts of the draft principles as they appeared at the conclusion of the eighteenth session, and the working papers submitted at the conclusion of the eighteenth session, and the working papers submitted at the eighteenth session in the course of the discussions of the Working Group and of the Sub-committee (A/AC.105/240, Annex I and annex IV, sect. A).

*Taken from the U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Legal Sub-Committee on the Works of its Nineteenth Session (10 March-3 April 1980), Doc. A/AC.105/271, Annex II (1980). The Appendix is omitted.

5. The Working Group also noted that the subject of remote sensing was an item on the agenda of the Scientific and Technical Sub-Committee at its seventeenth session held in February 1980; and that, as could be seen from the Scientific and Technical Sub-Committee's report on that session (A/AC.105/267), particularly chapter V, a number of matters of relevance to the work of the Legal Sub-Committee had been discussed by the Scientific and Technical Sub-Committee.

6. As to the organization of its work, the Working Group agreed that it would for the time being leave aside those principles on which tentative agreement had already been reached and would consider the remaining principles, namely, principles I, VIII, IX, XI, XII, XIII, XIV, XV and XVII, with the understanding that any of the remaining principles could be referred to by any delegation. Discussions proceeded on the basis of the texts of the draft principles set out in appendix A to the 1979 report of the Chairman of the Working Group and of the working papers submitted in 1979.

7. *Principle I.* Some delegations stressed the importance of making a clear distinction between "primary data" and "analysed information" since some provisions would only apply to the former, other provisions only to the latter, and some provisions to both categories. Other delegations questioned the appropriateness of the definitions, in the present text of the principle, of the terms "primary data" and "analysed information", and felt that the use of these terms throughout the whole set of the draft principles should also be taken into account. (The question of definitions was also raised in connexion with discussion on principle VIII.) Still other delegations doubted the need for a distinction between the two terms, but felt however, that the question of the definition of the two terms should be studied further, taking into account the purpose of each of the principles in which the terms would be used. The view was expressed, with reference to the term "analysed information", that the present definition was unclear since it used the expression "end-product" and that "analysed information" should include all stages of the analysis of primary data. At the suggestion of some delegations, who reminded the Working Group that the definitions had been worked out by the Scientific and Technical Sub-Committee and adopted by the Committee on the Peaceful Uses of Outer Space, the Working Group agreed that the existing definitions of "primary data" and "analysed information" in paragraphs (b) and (c) of this principle should continue to be used by the Working Group for working purposes without the definitions being considered as final.

8. *Principle II.* This principle was not discussed.

9. *Principle III.* The Working Group decided to add the words "relevant instruments of ITU" at the end of the text of this principle. The view was expressed that a reference to the present principles should also be included but this view did not meet with general agreement and it was decided to defer consideration of this suggestion.

10. *Principle IV.* The question was raised as to the meaning of the expression "elements. . ." at the end of paragraph 1 of this principle. After an explanation of the drafting history of this expression, the Working Group decided to substitute the word "principles" for the word "elements".

11. *Principles V—VIII.* These principles were not discussed.

12. *Principle VIII.* After an initial discussion of this principle, it was suggested that an informal drafting group be set up with a view to finding acceptable language for this principle. On the basis of the work of this informal group, the Working Group adopted a new text of this principle.

In order to arrive at an agreed understanding of the term "natural disaster" a representative of the Office of the United Nations Disaster Relief Co-ordinator (UNDRO) was invited to assist the Working Group. The representative of UNDRO informed the Working Group that UNDRO did not find it necessary to have an official definition of the term "natural disaster". Where reference to a definition was required, UNDRO resorted to the definition used by the League of Red Cross Societies. In the context of UNDRO, the concept of natural disaster normally refers to a sudden event with catastrophic effects upon large numbers of people such as an earthquake, flood, hurricane, tidal wave or a volcanic eruption, but it could occasionally refer also to man's impact upon the environment as in the case of a fire or an aircraft accident. UNDRO, which is only involved when co-ordination of assistance from different United Nations bodies is required, is not normally involved in the case of droughts, famines etc. because in such cases the assistance of only a single United Nations agency is required.

On the basis of the explanations given by the representative of UNDRO, the following definition of the term "natural disaster", to be included either within the text of the principle or in a foot-note to the principle, was suggested: "For the purpose of this principle, natural disaster means an extreme or violent act of nature". The view was also expressed that there should be a foot-note to the principle which would state that "a natural disaster consists of. . ." or, more generally, that "a natural disaster means a sudden event which catastrophically affects a large number of people". The view was expressed that the principle should perhaps not be restricted to natural disasters. The Working Group decided to leave the newly agreed text, for the time being, unchanged and to retain the present foot-note, as it was felt that a hastily formulated definition could result in an unduly broad or narrow application of the principle to sudden events.

13. *Principle IX.* Some delegations felt that this principle should be retained. Some delegations felt that this principle is redundant since other principles seem to cover its intent. The view was also expressed that the principle should not refer to "legitimate rights and interests of States" in this context and that the word "legitimate" was inappropriate since rights could not be illegitimate. The Working Group decided that the principle should be retained, pending a final decision being made at a later stage.

14. *Principle X.* This principle was not discussed.

15. *Principle XI.* No consensus could be reached in the course of the discussion as to the retention or deletion of this principle.

16. *Principle XII.* There was an extensive discussion of this principle, which, according to the practice of the previous years, was discussed in conjunction with principles XIII and XV. Some delegations were of the view that sensed States would have access to primary data concerning their territory on a timely and non-discriminatory basis and in any event not later than third States. Other delegations felt that such terms should be mutually acceptable to both sensing and sensed States. Some delegations stated that sensed States should have access to primary data before any third State. As a result of the discussion as to whether the words "before" or "no later than" should be used, it was decided that both alternatives should be included in the text of the principle in square brackets. Some delegations stressed the right of all States, and in particular developing countries, to have access to primary data and analysed information relevant to their territories as a reflection of a State's sovereignty over its natural resources and for the benefit of their development. Other delegations stated that no principle of international law authorizes a State to exercise control over data relating to its territory obtained from remote sensing by satellite or analysed information developed beyond its jurisdiction.

In the course of an initial discussion as to the employment of the term "data" used in the present text, some delegations felt that this term, for the purposes of this principle, should cover both "primary data" and "analysed information", the latter category being of particular importance in the context of this principle which provided for access of the sensed State to all data and information relating to its territory (see also principle I). Other delegations were of the view that the term "data" should consider only the question of access to primary data where general agreement about the underlying concept seemed possible, the question of "analysed information" being dealt with at a later stage. Some delegations stated that they could not accept this principle as also applying to analysed information since a sensing State might not have possession of, knowledge of or access to the information, thus creating insuperable legal and practical difficulties. While agreeing that there could be practical difficulties with regard to analysed information, the view was expressed that these difficulties were of a technical rather than legal nature and that it was of particular importance to developing countries to have access to analysed information. In this connexion, the view was expressed that in order to meet the demand of developing countries for analysed information, regional centres for analysis of primary data could be established and that a recommendation to the Secretary-General to that effect could be made. On the other hand, the view was expressed that such regional centres for analysis of primary data would mean full internationalization of information, which might not be in the interest of all States, since States themselves should determine what is to be done with data pertaining to their territories, and that this was in accordance with international law and the principle of sovereignty of States, and that the important question arising in this

context was rather what type of data should be disseminated. In the course of the discussion some delegations proposed oral amendments to the present text which were not, however, generally acceptable. On the basis of discussions of the Working Group and of informal consultations, the Chairman submitted to the Working Group a proposal containing specific language for this principle. In the course of further discussions, the Working Group adopted, with certain changes, the language proposed by the Chairman and decided to substitute such language for the present text of the principle, although the new text still contains a number of square brackets.

17. *Principle XIII.* Some delegations favoured prior notification to sensed States since, in the view of these delegations, remote sensing touched on the question of sovereignty of States. Other delegations, while also supporting the idea of prior notification, thought that remote sensing by satellite *per se* does not involve the question of the sovereignty of States. The view was also expressed that this question could, however, arise with regard to information which is used on earth and which could be used to the detriment of sovereign rights. Some of the delegations which favoured prior notification found the proposal submitted by the United States at last year's session (WG.III(1979)/WP.7) useful and practical, stating that countries should be aware of remote sensing programmes pertaining to their territories so that they could be in a position to know that there are data available and that they could make use of such data. Other delegations doubted the desirability of a principle on prior notification and referred to possible technical and practical difficulties in implementing a principle on prior notification. Some of these delegations felt that a list of countries about whose territories relevant remote sensing data exist should be communicated to the Secretary-General of the United Nations, and made reference to the working paper submitted by the USSR at last year's session of the Working Group (WG.III(1979)/WP.3). There was no agreement on the text of this principle.

18. *Principle XIV.* This principle was not discussed.

19. *Principle XV.* With regard to this principle, which presently appears in square brackets, some delegations found this principle necessary and spoke in favour of its retention while other delegations favoured the deletion of this principle. Some delegations felt that there should be no restriction on the dissemination of data obtained by the remote sensing of the earth by satellite or analysed information derived therefrom, and that a principle introducing a consent régime for the dissemination of such types of data would be unacceptable. These delegations pointed out that such a régime would present both legal and practical problems resulting in administrative, financial and technical burdens detrimental to programmes designed for remote sensing by satellite of the earth's natural resources and environment. The view was also expressed that it should be borne in mind that States having their own remote sensing satellites would have primary data relating to other countries regardless of whether restrictions were introduced regarding the dissemination of primary data. Other delegations favoured a régime which would require that the consent of the sensed State should be obtained for the dissemination of certain types of data which could be used to the detriment of the sensed States. Some of these delegations also felt that the question of the dissemination of certain data touched upon the sovereignty of States.

Other delegations expressed the view that, although the text would in principle be acceptable, more objective criteria could be introduced to delimit the data whose dissemination should be subject to the consent of the sensed State. These delegations found useful the concept underlying the proposal made by the USSR last year (WG.III(1979)/WP.1), which introduced spatial resolution as a criterion to describe the types of data whose dissemination should be subject to consent, and indicating, possibly, an alternative manner of delimiting the restricted data. Some of the delegations that spoke against a consent régime pointed out that notwithstanding their objection, in principle, against such a régime, spatial resolution would not provide a reliable and standard reference because of technical and practical difficulties in establishing the actual spatial resolution in each instance.

Some delegations pointed out that there were no objective, scientific or technical reasons for classifying primary data in some rigid fashion into categories which could be subjected to different dissemination rules and that adding the criteria of spatial resolution to a consent régime would greatly compound the considerable practical problems with such a régime referred to above. Some delegations reserved their final position on this principle depending upon the text which may be adopted regarding principle XII.

20. *Principle XVI.* The view was expressed that this principle is necessary and should be retained. Reference was also made to the proposal of the delegation of Romania submitted at last year's session concerning this principle (A/AC.105/C.2/L.122). There was no further discussion.

21. *Principle XVII.* Some delegations proposed the deletion of the square bracket presently appearing around this principle, pointing out that there should be at least agreement that disputes regarding remote sensing should be settled peacefully. Other delegations thought that consideration should also be given to the deletion of this principle. Other delegations stated that they could not take a final position on the language of this principle without knowing what the contents and legal nature of the other principles would be and that this principle should therefore remain in square brackets. The Working Group decided that the expression "established procedures" in the fifth line of the present text should be reformulated to read: "[existing] [established] procedures", on the understanding that the possibility of deleting both the adjectives "[existing] [established]" should be left open. It was further decided that the present foot-note to principle XVII should be aligned to the present foot-note to principle XII.

22. The Working Group held its final meeting on 2 April 1980 when it considered and approved the report to be made by its Chairman to the Sub-Committee.

23. The texts of the draft principles, at the conclusion of the work of the Working Group, are set out in the Appendix to this report.

IV.

AMERICAN BAR ASSOCIATION REPORT TO THE HOUSE OF DELEGATES
SECTION OF INTERNATIONAL LAW*

RECOMMENDATION

The American Bar Association Section of International Law recommends the following resolution for adoption by the House of Delegates of the American Bar Association:

"BE IT RESOLVED that the American Bar Association favors the signature and ratification by the United States of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, and urges the Senate to give its advice and consent to ratification, subject to the inclusion of the following understandings and declarations in the instrument of ratification:

"(a) It is the understanding of the United States that no provision in this Agreement constrains the existing right of governmental or authorized non-governmental entities to explore and use the resources of the moon or other celestial body, including the right to develop and exploit these resources for commercial or other purposes. In addition, it is the understanding of the United States that nothing in this Agreement in any way diminishes or alters the right of the United States to determine how it shares the benefits derived from exploitation by or under the authority of the United States of natural resources of the moon or other celestial bodies;

"(b) Natural resources extracted, removed or actually utilized by or under the authority of a State Party to this Agreement are subject to the exclusive control of, and may be considered as the property of, the State Party or other entity responsible for their extraction, removal or utilization;

"(c) The meaning of the term "common heritage of mankind" is to be based on the provisions of this Agreement, and not on the use or interpretation of that term in any other context. Recognition by the United States that the moon and its natural resources are the common heritage of all mankind constitutes recognition (i) that all States have equal rights to explore and use the moon and its natural resources, and (ii) that no State or other entity has an exclusive right of ownership, property or appropriation over the moon, over any area of the surface or subsurface of the moon, or over its natural resources in place. In this context, the United States notes that, in accordance with Articles XII and XV of this Agreement, States Parties retain exclusive

* Approved by the Section of International Law on April 18, 1980; the text does not constitute a formal ABA position until approval by the House of Delegates Annual Meeting in September 1980.

jurisdiction and control over their facilities, stations and installations on the moon, and that other States Parties are obligated to avoid interference with normal operations of such facilities.

“(d) Acceptance by the United States of an obligation to undertake in the future good faith negotiation with other States Parties of an international regime to govern exploitation of the natural resources of the moon in no way prejudices the existing right of the United States to exploit or authorize the exploitation of those natural resources. No moratorium on such exploitation is intended or required by this Agreement. The United States recognizes that States Parties to this Agreement are obligated to act in a manner compatible with the provisions of Article VI(2) and the purposes specified in Article XI(7); however, the United States reserves to itself the right and authority to determine the standards for such compatibility unless and until the United States becomes a party to a future resources exploitation regime. In addition, acceptance of the obligation to join in good faith negotiation of such a regime in no way constitutes acceptance of any particular provisions which may be included in such a regime; nor does it constitute an obligation to become a Party to such a regime regardless of its contents.”

A. Past Events

1. *First Seminar on the Outer Space Law of the Interkosmos Countries, Warsaw, October 3-5, 1979.*

The cooperation of socialist countries in the domain of the exploration and peaceful exploitation of outer space began in the early sixties. Since 1967 it is conducted within the frame work of the Interkosmos program which is now based on an international agreement signed in 1976 by 9 socialist States. Since May 1979 the Socialist Republic of Vietnam is also participating in the program. Alongside with the realization of the Interkosmos program many legal problems of great practical importance arise.

These problems were the object of a seminar in which 40 lawyers from socialist countries participated. During the three days of the conference, 14 speeches were given, concerning such subjects as rendering the program more efficient, the relations of member countries of Interkosmos with other states and general problems of outer space law.

The speeches of Dr. J. M. Kolosov, Dr. V. S. Vereshchetin and Dr. E. G. Vasilevskaja from the U.S.S.R. were of great interest to all listeners. These speeches were on the actual problems resulting from the proceedings of the Interkosmos program. An eager discussion was also conducted about the problem of the legal status of flights involving international crews which was presented in a speech by Dr. J. Gospodarek from Poland, as well as about the problem of joint responsibility for damages. The latter was presented by Dr. K. Wiewiórowska from Poland. Among the problems presented in Warsaw were many questions of outer space law presently discussed at the forum of the UN, such as the legal and political aspects of remote sensing (speech of Prof. Busak from Czechoslovakia), and the definition and delimitation of outer space (speeches of Dr. G. Gál from Hungary and Dr. V. Kopal from Czechoslovakia).

The discussion of the experts of outer space law, from countries participating in the Interkosmos program, initiated in Warsaw, will be continued in 1980 during a seminar on outer space law in Bulgaria.

Dr. K. Wiewiórowska
Polish Institute of
International Affairs

2. *Space Law Workshop, Annual Meeting of the American Society of International Law, Washington, D.C., August 18, 1980.*

The subject of the Workshop, sponsored by the Association of United States Members of the International Institute of Space Law, IAF, was "The Moon Treaty: Should the United States Become a Party?"

The initial speaker was Mr. Stanley R. Sadin, Deputy Director for Program Development, Space Systems Division of NASA's Office of Aeronautics and Space Technology. Mr. Sadin, with Vu-graph illustrations, discussed exploitation of natural resources of the moon. He explained the resources available, how they would be extracted and the use to be made of them in outer space activities, such as construction of a solar powered space station. Dr. Stephen R. Bond, Ass't. Legal Adviser for United Nations Affairs, Department of State and Chairman of the U.S. delegation to the 1979 meeting of the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space, gave the history of the Moon Treaty—which was a product of the Legal Subcommittee—with particular explanation of the origin of provisions which are under active discussion in the consideration of the Treaty's acceptance. Professor Stanley B. Rosenfield, New England School of Law, Boston, spoke against U.S. acceptance of the Treaty as not in the national interest. Arguing for the Treaty's acceptance was Dr. Delbert D. Smith, of Madison, Wisconsin, who is Editor of *Satellite Communications* magazine and among other recent space law writings has authored "Space Stations: International Law and Policy (1979).

Floor discussants included Professor Stephen Gorove and Dr. Edward R. Finch, Jr. Martin Menter served as Moderator of the Program.

Martin Menter
President, Association of the U.S. Members
of the Int'l Inst. of Space Law (IAF)

3. *Symposium on "Space Law in Perspective", University of Mississippi Law Center, April 21, 1980.*

Organized and chaired by Professor Stephen Gorove, the Symposium on "Space Law in Perspective" brought together a number of leading authorities both from the United States and abroad for a one-day conference at the University of Mississippi Law Center on April 21, 1980.

Speakers and their topics of discussion included: Aldo Armando Cocca, "The Advances in International Law Through the Law of Outer Space" (paper read *in absentia*); Eilene M. Galloway, "Perspectives of Space Law"; Stephen E. Doyle, "Significant Developments in Space Law: A Projection for the Next Decade"; Hamilton DeSaussure, "Maritime and Space Law Comparisons and Contrasts"; Carl Q. Christol, "The Moon Treaty in Perspective"; Martin Menter, "Commercial Participation in Space Activities"; David M. Leive, "Essential Features of INTELSAT: Applications for the Future"; S. Houston Lay, "Direct Broadcast Satellites: A Look at the Future"; Jean-Louis Magdelénat, "Legal Aspects of Remote Sensing"; Arthur M. Dula, "Draft Share-Shuttle Contract from a Business Perspective"; George S. Robinson, "Space Law As It Was, As It Is and As It Ought To Be"; and S. Neil Hosenball, "The Space Shuttle in Perspective: Commercial Aspects". Edward R. Finch, Jr. acted as moderator of the Symposium.

The presentations were followed by questions and a lively discussion developed around some of the controversial provisions of the proposed Moon Treaty.

The Symposium was co-sponsored by the American Society of International Law, the International Institute of Space Law, the Lamar Society and the University of Mississippi Law Center. The papers are expected to be published by the L.Q.C. Lamar Society of International Law at the University of Mississippi Law Center.

Stephen Gorove
Vice-President for Programs
Ass'n of the U.S. Members of the
Int'l Inst. of Space Law (IAF)

4. Program on International and Domestic Aerospace Law at the AIAA Global Technology 2000 Meeting, Baltimore, May 8, 1980.

Gerald J. Mossinghoff, Deputy General Counsel of NASA and Chairman of the American Institute of Aeronautics and Astronautics (AIAA), Technical Committee on the Legal Aspects of Astronautics and Aeronautics, was the chairman and organizer of the AIAA program on current legal matters of interest to aerospace scientists, engineers, and managers. This program was presented during the AIAA Global Technology 2000 meeting in Baltimore in May.

The program included the following papers: "Space-Related Aspects of the General World Administrative Radio Conference" by Ronald Stowe, Assistant General Counsel, Satellite Business Systems; "Indemnification of Aerospace Contractors for Catastrophic Accidents" by Thomas Williamson, with the law firm of Morgan, Lewis & Bockius; "Legal Issues in Instituting an Operational Remote Sensing Program" by Eldon Greenberg, General Counsel, National Oceanic and Atmospheric Administration; "The Moon Treaty: A Legal Perspective" by Delbert D. Smith, Editor, Satellite Communications; "Legal Preparations for the Space Shuttle Era" by Gerald J. Mossinghoff.

At the Global Technology 2000 meeting, the AIAA Board of Directors formally established the Committee on the Legal Aspects of Astronautics and Aeronautics as a standing Technical Committee of the Institute.

Gerald J. Mossinghoff
Deputy General Counsel of NASA
Chairman of the AIAA Technical Committee
on the Legal Aspects of Astronautics and
Aeronautics

5. *Conference on "World Communications: Decisions for the Eighties". The Annenberg School of Communications, University of Pennsylvania, May 12-14, 1980.*

An extremely informative and challenging conference on "World Communications: Decisions for the Eighties" was held, with several hundred participants from all over the world, at the University of Pennsylvania's Annenberg School of Communications on May 12-14, 1980. While the conference had a very broad base covering all aspects of communications, one of the sessions entitled "After WARC '79", chaired by Wilson P. Dizard of the Department of State, Vice Chairman of the U.S. delegation to WARC, dealt with the recent World Administrative Radio Conference and its aftermath. Topics discussed included: "Third World Countries at WARC: Positions and Achievements" (Nolan A. Bowie); "Communication and Computing in The 1980's" (John deMarcado); "WARC 1979: Some Legal and Political Implications" (Stephen Gorove); "Are U.S. Policies at Home and Abroad Consistent?" (Harvey J. Levin); "Changing Ground Rules for Spectrum Policy" (William H. Melody); "A Post-WARC View. U.S. Achievements, Problems, and Issues yet to be Faced" (Kalmann Schaefer).

The conference papers and proceedings are expected to be published.

Stephen Gorove
Vice-President for Programs
Ass'n of the U.S. Members of the
Int'l Inst. of Space Law (IAF)

6. *Other Events*

A Session on Air and Outer Space Law, consisting of courses and seminars, was conducted by a group of eminent professors of different countries and officials of international organizations at the University of Thessaloniki from August 13 to 31, 1979.

During the Annual Meeting of the Association of American Law Schools held in Phoenix, Arizona the newly formed Committee on Aviation and Space Law held its first meeting on January 5, 1980 at which S. Neil Hosenball, General Counsel of NASA spoke extensively about some of the commercial and legal aspects of the Space Shuttle.

A Conference on Pacific Telecommunications was held in Honolulu on January 7-9, 1980 in order to provide a forum for a discussion of technical, economic, social and regulatory aspects of communications throughout the Pacific area.

During the Eighteenth Goddard Memorial Symposium on "Commercial Operations in Space 1980-2000", which was held in Washington, D.C. on March 27-28, 1980, one of the sessions focused on "International Opportunities", while another session, chaired by Dr. Eugene Emme was organized as the Second Annual

Space History Symposium at which Stephen E. Doyle reviewed the "Evolution and Problems of Space Law." At a third session on "Lunar Agreement (Public Debate)", S. Neil Hosenball presented the "Pro" side while Leigh Ratiner argued the "Con" side of the Moon Treaty. Lively questions and discussions ensued. Yet another session, chaired by James W. Barrett, was devoted to "Commercial Launch Operations" and discussants and their topics included: James W. Barrett, "Insuring the Risks of Commercial Space Operations"; Daniel E. Cassidy, "The Space Industrialization Act and the Government's Role in the Commercialization of Space"; and Delbert D. Smith, "The NASA Launch Services Agreement and Commercial Operations in Space."

7. Brief News

Austria became an associate member of the European Space Agency. . . The first Ariane test flight in December 1979 was successful. . . The President designated the Commerce Department's National Oceanic and Atmospheric Administration (NOAA) to manage all operational civilian remote sensing activities from space. . . The Senate Committee on Commerce, Science, and Transportation has requested four reports in connection with the pending ratification of the Moon Treaty. Among them are: an analytical report to be prepared by Eilene Galloway, an interdisciplinary study of the treaty by the Congressional Research Service, and an assessment by the Congressional Office of Technology Assessment of the impact of the treaty upon the capability of the United States to exploit extraterrestrial materials. . . The Subcommittee on Science, Technology, and Space of the Committee on Commerce, Science, and Transportation of the U.S. Senate is scheduled to hold hearings on June 26 and July 24, 1980 on the planning by the Executive branch of an operational land remote sensing satellite system. . . Brazil plans to launch a satellite some time in the mid-1980's.

B. Forthcoming Events

An International Symposium on Solar Power Satellites is being held in Toulouse, France at the Centre d'Etudes et de Recherches de Toulouse on June 25-27, 1980.

"The Industrialization and Settlement of Space" is the title of a Summer Program organized by California State University in Northridge, July 14-August 22, 1980. Some of the scheduled speakers include: Krafft Ehrlicke, Charles Sheffield, Eilene Galloway and Jerry Grey.

As reported in our previous issue, the 23rd Colloquium on the Law of Outer Space will be held during the XXXI Congress of the International Astronautical Federation in Tokyo, Japan, September 21-28, 1980. Subjects to be discussed include: (a) Implications of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies; (b) Implications of the World Administrative Radio Conference (WARC) 1979; (c) Protection of the Environment: Earth, Celestial Bodies and Outer Space; (d) Patterns of International Space Cooperation (international regimes applicable to space activities, regime for international manned flight, etc.).

International Cooperation in Outer Space: Legal Problems, by V. S. Vereshchetin ("Science" Publishing House, Moscow, 1977). 264 pages.

The author is Vice-President of the Intercosmos Council of the Academy of Sciences of the USSR. This fact is very significant as the Council plays in the Soviet Union the role of the organ which coordinates cooperation in the exploration and use of outer space. Also in accordance with Article 7 of the Agreement of July 13, 1976 on Cooperation in the Exploration and Use of Outer Space for Peaceful Purposes, the aforementioned Council coordinates the activities of analogous organs of the remaining States which participate in the performance of the Intercosmos program. Therefore Vereshchetin's book concerning the legal problems of States arising from their mutual scientific and technical activities in outer space is of specific value.

This book contains an introduction and 13 chapters grouped in two parts. Part One presents the legal mechanism of international space programs. Part Two covers the analysis of legal problems concerning the practical applications of international space systems. Furthermore, the book provides a bibliography of Soviet literature on international space law up to January 1, 1977, which was made by E. P. Kamenetskaya.

In Chapter One, Vereshchetin analyzes the treaty as the basic legal instrument of international cooperation in the domination of outer space. He foresees with reason that scientific and technical cooperation in outer space will become of civil law character in the future (p. 18). Presently this joint space activity is generally regulated by treaties signed in States' or Governments' names and also by interdepartmental international agreements. The author points out that the Academy of Sciences of the USSR is a national organ which has special competencies in international relations concerning the exploration and use of outer space (pp. 13-14). The Intercosmos Council has similar authorizations to enter into interdepartmental agreements.

Chapter Two presents the issue of multilateral cooperation of socialist states in the Intercosmos program. Vereshchetin emphasizes that the performance of this program does not mean the creation of an intergovernmental international organization *sensu stricto*, because it lacks certain attributes of an organization such as a special founder's act, an international secretariat, and a common budget. More arguments are provided by the Intercosmos Agreement of July 13, 1976, which in Article 6 establishes a rule that each State itself covers the costs of the participation of its organizations in the performance of the planned experiments and space explorations, if not otherwise decided in separate agreements.

Chapter Three concerns cooperative bilateral programs between the Soviet Union and other states in the exploration and use of outer space. The author analyzes separate treaties with the United States, France, and India, with emphasis on Soviet-American cooperation.

The following two chapters present international space programs of West European States and the United States. Part One of the book is ended by Chapter Four which is dedicated to the role of the United Nations and specialized agencies as well as the role of

nongovernmental international organizations in the elaboration and performance of space programs.

Special attention should be paid to Chapter One, Part Two, which concerns the connections between the principle of State sovereignty and the use of outer space for practical purposes on Earth. The author criticizes such ideas which deny the importance of this principle in the regulation of States' activities in outer space. As a conclusion, V. S. Vereshchetin states that the concordance between the law and any concrete kind of use of space technics for the solution of practical problems on Earth should be specified according to whether the given activity fulfils the generally accepted principles of international law (including space law), and especially the principles of the observance of State sovereignty and the sovereign equality of States (p. 145).

In the following chapters of this part of the book, the above described point of view is elaborated. Chapter Two contains the comparative analysis of international communication-satellite systems: Intersputnik and Intelsat. In Chapter Three, which concerns direct broadcast satellites, the author declares his belief in the necessity to regulate this issue by space law, assuming that the previous consent of a State in the establishment of a regime for DTBS is indispensable. In this issue, the adduction of the lack of generally accepted principle of freedom of information creates controversies (pp. 177-8). The author takes no account of the limitations of this principle which are expressed, for example, in Article 19, paragraph 3 of the International Covenant of Civil and Political Rights.

In Chapter Four, concerning outer space navigation, Vereshchetin emphasizes that satellites used for these purposes do not demand a special legal status, as they do not directly influence the performance of sovereign rights by States. The statement that the compromise solution of the problem of the voting procedure in the organs of Inmarsat cannot serve as a precedent in the further regulation of principles of international cooperation in outer space is (p. 193) controversial.

Chapter Five covers the problems of the practical use of space technology in meteorology. The author presents the significant achievements of international cooperation in this domain. In the following chapter on the remote sensing of the Earth from outer space, Vereshchetin expresses his opinion that there exists a need to determine the principles of use of informations about the natural resources of other States (pp. 212-3). He also states that the equatorial States' claims to their sovereign rights over the geostationary orbit cannot be considered as being in concordance with international law, although this problem is not developed in the book.

Chapter Seven concerns the legal status of international orbital stations. The definition of such space objects as quoted in this book states that it is "a constructed or used by two or more States outer space complex which can work for a pretty long time on Earth orbit with a piloted or automatic system, and intended for fulfilment of scientific, technical and national economy's task" (pp. 228-9). This definition casts some

doubt at the present stage of constructing experimental stations on Earth orbits. This may point to the reason why joint flights of astronauts from socialist States in accordance with the Intercosmos program do not exceed a few days. Also the planned Spacelab orbital missions are to last only 7 to 30 days. It seems that nowadays it is impossible to speak about an international orbital station functioning automatically, as it is the international crew itself which gives the orbital station an international character.

Dr. Vereshchetin's book is a permanent contribution to the studies of outer space law. This very interesting legal study is the creative extension of problems presented in a prior book by V. S. Vereshchetin, *Outer Space. Cooperation. Law* ("Sciences" Publishing House, Moscow, 1974).

Dr. Jerzy Gospodarek
Vice-President, Commission of Space Law,
Polish Astronautics Society

E. G. Vasilevskaja: *Pravovyy status prirodnykh resursov lunny i planiet (Legal Status of the Natural Resources of the Moon and Other Planets)*, Nauka, Moscow, 1978, 142 pages.

The rapid development of cosmonautics has caused the exploitation of the Moon's natural resources as well as those of the other planets to become more probable. At the same time, the accelerated development of cosmonautics is accompanied by a change in the approach to the solving of legal problems connected with it: in the first stage, activities in the outer space outstripped legal regulations, whereas now it is becoming more frequent that legal regulations are made in advance for some activities. Negotiations held before the forum of the U.N. on the legal principles of direct broadcast satellites and also on the legal aspects of the exploitation of the natural resources of the Moon and other planets of the solar system may serve as examples. E. G. Vasilevskaja's book is mainly dedicated to this specific problem.

The reviewed book consists of an introduction and two parts. The first part considers the legal status of the natural resources of the Moon and other planets, while the second one considers the legal regulation of the exploration and exploitation of these resources.

Thanks to the deliberations contained in the introduction, the reader becomes familiar with the main achievements of the 20-years of space activities as well as with the actual stage of development of outer space law. This introduction enables the understanding of the importance of establishing legal norms regulating the exploitation of the natural resources of the Moon and other planets. Otherwise, this necessity would seem to be only a theoretical problem for a person loosely connected with outer space law.

In the first part the author tried to explain and establish definitions of "natural resources", "exploration" and "exploitation". In the relevant discussions the author uses abundant literature from the domain of international law concerning the principle of Earth's natural resources and their division into those, which are on a state's territory and the international ones, or in other words, those which lay beyond the boundaries of a state's jurisdiction. The vast definition of natural resources of the Moon and planets accepted by the author (p. 25) is of great benefit to outer space law where the establishment of a definition is a troublesome assignment. It is sufficient just to recall the fact that in spite of the 22 years of man's activities in space, we lack legal definition of "outer space" and "space object" although these two terms appear in all of the multilateral agreements concerning outer space.

In the discussed part, the critical analysis of the views of outer space law doctrine concerning the legal status of the natural resources of the Moon and other planets is also of great interest. The author refers to the abundant literature on the natural resources of the high sea and the Antarctic, though warning us not to apply analogies in this domain too eagerly (p. 44). The author presents a wide range of views and conceptions of lawyers from the whole world based on speeches and discussions held on the yearly colloquiums of outer space law organized by the International Institute of Space Law. E. G. Vasilevskaja undertakes an interesting polemic with the opinions widespread mainly in the Latin American doctrine, proving that the idea of "the common heritage of mankind" in outer space law is not identical with the analogous statement in the law of the sea. This eventually leads to the criticism of the idea of creating an agency for the purpose of exploiting the natural resources of the Moon and other planets. (pg. 45-65). Therefore it should be stressed that the acceptance of the natural resources of the Moon and other celestial bodies as the common heritage of mankind expressed in the Moon Agreement does not imply acceptance of principles governing their exploitation. For it was accepted that these principles will be established directly before the initiation of the exploitation. Therefore this problem will remain an object of dispute to which the author makes a valuable contribution.

The second part of the book deals with the documents of international law concerning the exploration and exploitation of the natural resources of the Moon and planets, beginning with the U.N. General Assembly's resolution of 1961 and ending with the undertaking of attempts of creating a project of a Treaty concerning the Moon. It is worth mentioning that the Soviet Union, before the U.N. forum in 1971, put forward the proposal of working out such an agreement, presenting at the same time the draft of the Moon Agreement. According to the accepted procedure, the Soviet draft was submitted to the U.N. Outer Space Committee where it was an object of negotiations lasting 8 years.

In this section there are discussed some of the main provisions of the draft Agreement on the Moon, concerning the exploitation of natural resources and the notification about missions to the Moon. As the author righteously points out (pp. 113-114), the principles of the Moon Agreement should be treated as a logical continuation and specification of the provisions contained in the Outer Space Treaty of

1967 and of the general principles of international law concerning outer space activities. The analysis by the author of the main provisions of the draft Agreement in which the changes made in them during the negotiations are pointed out, facilitates both acquaintance with the viewpoints of particular states and understanding the essence of the divergence of opinions as to the Moon Agreement, the notification about missions to the Moon, and most of all, the legal status of the Moon's natural resources. The above represents an interesting illustration of the process of elaborating principles of outer space law.

The book is concluded by a chapter dedicated to the perspectives of legal regulation of states' activities on the Moon and other celestial bodies. The author righteously underlines the significance of negotiations on the Agreement in the further development of outer space law and peaceful cooperation in outer space. Therefore it is also worth stressing that in December 1979 the final text of the Moon Agreement was accepted by XXXIVth session of the U.N. General Assembly.

As a conclusion it should be stated that the interesting research done by E. G. Vasilevaskaja concerning the difficult problem of the legal status of the natural resources of the Moon and other planets constitutes a permanent contribution to outer space law. In this context also should be stressed the exceptional competence of the author, who—as a member of the Soviet Union's delegation to the sessions of the Outer Space Committee and its Legal Subcommittee—personally contributed to the elaboration of the Moon Agreement.

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The Partnership: A History of the Apollo-Soyuz Test Project by Edward Clinton Ezell and Linda Neuman Ezell. (NASA History Series, Washington, D.C., 1978). 560 pages.

The history of the Apollo-Soyuz Test Project marked the first joint adventure between the United States and the Soviet Union. Beginning with events in the 1950's the *Partnership* retraces the political maneuvering and the various aspects of negotiations which have led to the signing on May 24, 1972, of the "Agreement Concerning Cooperation in the Exploration and Use of Outer Space For Peaceful Purposes."

The text is not targeted to space lawyers, but scholars interested in a case study of an international joint adventure shedding light on politics, diplomacy as well as the organizational and engineering aspects, will find this book a thoroughgoing, readable and well-documented treatise.

Space Shuttle: Dawn of an Era. (Volume 41, Parts I and II, The Advances in the Astronautical Sciences), edited by William F. Rector III and Paul A. Penzo, Published for the American Astronautical Society by Univelt, Inc., San Diego, Calif. (1980), 948 pages.

This book is a compilation of the proceedings of the 26th American Astronautical Society Annual Conference held October 29-November, 1979 in Los Angeles. Fourteen sessions were conducted representing Shuttle Technology, payloads and operations.

Part I contains the sessions on the Shuttle elements and operations. Part II contains sessions on payloads and one session on space medicine. Government and industry leaders of the space program participated as session chairmen and co-chairmen.

The first article, written by Brig. Gen. Robert A. Rosenberg, USAF, of the National Security Council, and Lt. Col. Wayne L. O'Hern, USAF, of the Industrial College of the Armed Forces, contains a discussion of current domestic space policies and challenges to the international legal regime. Although none of the later sessions included discussions of space law as applied to the Shuttle, several of the papers presented at the conference will help persons interested in the area of space law to enlarge their perspective of the opportunities provided for international cooperation through the development and operation of the Shuttle.

Space Stations: International Law and Policy. by Delbert D. Smith (Westview Press, 1979). 246 pages.

The concept of space stations, once confined to science fiction, now is approaching reality, and the legal problems associated with space stations are analyzed in this volume.

The author defines the term "space station" as "a man-made object or facility in outer space established with a purpose, such as to provide goods or services." The station will be larger than the typical satellite, remain in use for a long period of time, and may be either manned or unmanned. The present plans generally center around space information systems, but earth sensing services space stations, space power stations, and space manufacturing stations have been designed also.

The legal discussion begins with the work institutions such NASA are currently performing in the area, the alternatives to the institutional approach, and the component ownership possibility. The existing international treaties affecting space stations are detailed in their application. The legal issues discussed include the "peaceful uses" of space, the military implications of space stations, the protection of space stations, and the role space stations serve in the common heritage of mankind.

The most original part of the book is the plan for a general space station model, Starbase, in which the concepts of component ownership of space stations dovetail with the latest concepts in space use.

A. Books

- American Astronautical Society, *Space Shuttle: Dawn of an Era*, in vol. 41 *Advances in Astronautical Sciences* (1980).
- D. Baker, *Space Shuttle* (Crown, 1979).
- A. Bauza, *Principios de Derecho Especial*, (Montevideo: distribudor exclusivo Editorial Liberia Juridica A.M. Fernandez, 1977).
- W. Gale (ed.), *Life in the Universe: The Ultimate Limits to Growth* (Westview Press, 1979).
- J. Looney, *Bibliography of Space Books and Articles from Non-Aerospace Journals 1957-1977* (NASA, 1979).
- Nicolas M. Matte, *Space Policy and Programmes Today and Tomorrow—The Vanishing Duopole* (Institute and Centre of Air and Space Law, McGill University, Montreal, 1980).
- P. Moore, *The Next Fifty Years in Space* (Taplinger, 1978).
- L. Morris, *Bibliography of Air and Space Law Materials* (Monash University, Australia, 1978).
- S. Tapia, *Trabajos de Derecho Aeronautico y del Espacio*, (Instituto Iberoamericano de Derecho Aeronautico y del Espacio y de la Aviacion Comercial, Madrid, 1978).

B. Articles

- Bhatt, *An Ecological Approach to Aerospace Law*, 4 *Ann. Air & Space L.* 385 (1979).
- Bourély, *Le Canada et l'Agence spatiale européenne*, 4 *Ann. Air & Space L.* 397 (1979).
- Bueckling, *Die Aufweichung des Rechtsbegriffs im Weltraumrecht, aufgerissen in rechts-historischen Zusammenhängen*, 28 *Zeitschrift für Luft- und Weltraumrecht* 363 (1979).
- Buschbeck, *Weltraumrecht in den Vereinten Nationen. Sachstandsbericht über neuere Entwicklungen*, 28 *Zeitschrift f. Luft- und Weltraumrecht* 205 (1979).
- Bylinsky, *Space Will be the Next Big Construction Site (For Solar Power Satellites)*, 99 *Fortune* 62 (1979).
- Chapman and Warren, *Direct Broadcast Satellites: The ITU-UN and Real World*, 4 *Ann. Air & Space L.* 413 (1979).

- Christol, Protection of Space from Environmental Harms, 4 Ann. Air & Space L. 433 (1979).
- Croteau, Remote Sensing (Use of Aircraft and Satellites For Water Resource Development), 11 Water Spectrum (Corps of Engineers) 46 (1979).
- Diederiks-Verschoor, Comparisons Between Air Law and Space Law Concerning Liability for Damages Caused by Aircraft and Space Objects, 28 Zeitschrift f. Luft- und Weltraumrecht 385 (1979).
- Finch and Moore, Cosmos 954 Incident and International Space Law, 65 A.B.A. J. 56 (1979).
- Galloway, Recent Developments in U.S. Space Policy, 4 Ann. Air & Space L. 483 (1979).
- Gorove, Solar Power Satellites and the ITU: Some U.S. Policy Options, 4 Ann. Air & Space L. 505 (1979).
- Grange, Visual Remote Sensing and Privacy Interests of the Fourth Amendment, 1 Northrop U.L.J. of Aerospace, Energy and the Environment 33 (1979).
- Hahn, Developments Toward a Regime for Control of Remote Sensing from Outer Space, 12 J. Int'l Econ. 421 (1978).
- Hosenball, The United Nations Committee on the Peaceful Uses of Outer Space: Past Accomplishments and Future Challenges, 7 J. Space L. 95 (1979).
- Hughes and Robinson, Space Law: The Impact of Synthetic Environments, Malnutrition and Allergies on Civil and Criminal Behavior of Astronauts, 19 Jurimetrics J. 59 (1978).
- Jasentuliyana, A Perspective of the Use of Nuclear Power Sources in Outer Space, 4 Ann. Air & Space L. 519 (1979).
- Kolosov and Kulebyakin, Remote Earth-Sounding: the Legal Aspect, 14 New Times (Moscow) 22-3 (1978).
- Lay, Nuclear Technology in Outer Space, 35 Bull. Atom. Scientists 27 (1979).
- Light, Space Shuttle Will Usher in New Spaceflight Era, Despite Delays, Budget Cuts, and Controversy, 37 Cong. Q. W. Rep. 784 (1979).
- Loriot, Propriété intellectuelle et droit spatial, 4 Ann. Air & Space L. 553 (1979).

- Marcoff, La liberté de l'espace—règle de droit international à condition résolutoire, 28 *Zeitschrift f. Luft- und Weltraumrecht* 405 (1979).
- Margo, Some Aspects of Insuring Satellites, *Ins. L.J.* 555 (1979).
- Matte, Space Policy Today and Tomorrow, 4 *Ann. Air & Space L.* 569 (1979).
- Mossinghoff, Managing Tort Liability Risks in the Era of the Space Shuttle, 7 *J. Space L.* 120 (1979).
- Paine, Next Century in Space; Address, July 24, 1979, 45 *Vital Speeches* 734 (1979).
- Perek, Outer Space Activities Versus Outer Space, 7 *J. Space L.* 115 (1979).
- Priest, Nixon and Rice, Space Disposal of Nuclear Wastes, 18 *Astronautics & Aeronautics* 26 (Apr. 1980).
- Robinson G., Frontier Law at L.5, 4 *Ann. Air & Space L.* 617 (1979).
- Robinson, M., The Second United Nations Conference on Outer Space—An Opportunity for the Future, 7 *J. Space L.* 131 (1979).
- Rosenfield, Where Air Space Ends and Outer Space Begins, 7 *J. Space L.* 137 (1979).
- Rothblatt, International Liability of the United States for Space Shuttle Operations, 13 *Int'l Lawyer* 471 (1979).
- Sarkar, Space Communication in Tomorrow's Society, 6 *Acta Astronautica* 1717 (1979).
- Sarkar, Space Solar Power vs. Space Communications, 6 *Acta Astronautica* 1753 (1979).
- Skorheim and White, The Law of Outer Space: A Symbol of Social Maturity, 6 *W. St. U. L. Rev.* 101 (1978).
- Sloup, Liability and Insurance Aspects of the Space Transportation System Under the New Section 308 of the National Aeronautic and Space Act, 4 *Ann. Air & Space L.* 639 (1979).
- Vasilyev, Space Colonies: Two Approaches, 188 *Space World* 33 (1979).
- Vereshchetin, Poravovue Polozhenie Mezhdunarodnykh Kusmicheskikh Ekipazhei, 49 *Sovetskoe Gosudarstvo i Pravo* 94 (1979).
- Vereshchetin and Petrunin, Soviet-French Cooperation in Space, *Int'l Aff. (Moscow)* 28 (Nov. 1978).

Von Kries, Zum Recht internationaler Kommunikationssatelliten-Organisationen, 28 *Zeitschrift f. Luft- und Weltraumrecht* 393 (1979).

Von Puttkamer, Industrialization of Space, 13 *Futurist* 192 (1979).

Book Reviews/Notices

Benson, C. and Faherty, W., Moonport, 7 *J. Space L.* 192 (1978).

Bockstiegel, K. (ed.), Die Produkthaftung in der luft- und Raumfahrt, Dokumentation eines Internationalen Kolloquiums in Köln 1977 (Product Liability in Air and Space Transportation, Proceedings of an International Colloquium in Cologne, 1977), 7 *J. Space L.* 190 (1979).

Brooks, C., Grimwood, J., and Swenson, L., Chariots for Apollo, 7 *J. Space L.* 191 (1979).

Espada, C., La Responsabilidad Internacional por Danos en el Derecho del Espacio (International Responsibility for Damages in Space Law), 7 *J. Space L.* 190 (1979).

Grey, J., Enterprise (R. Bilstein), 104 *Lib. J.* 2110 (1979).

Matte, N., Aerospace Law: From Scientific Exploration to Commercial Utilization (S. Gorove), 7 *J. Space L.* 189 (1979).

Salkend, R., Patterson, D., and Grey, J. (eds.) Space Transportation Systems 1980-2000, 7 *J. Space L.* 191 (1979).

C. Official Publications

Agreements (Bilateral)

Agreement Amending the United States-Australia Treaty of March 25, 1970, Concerning Tracking Stations. Entered into force March 3, 1978. (No. T.I.A.S.)

Agreement with Canada Concerning Support of U.S. Activities at the Canadian National Research Council Space Research Facilities. Effected by exchange of notes at Ottawa March 19 and September 20, 1979. Entered into force September 20, 1979. Effective July 1, 1979. (No. T.I.A.S.)

Agreement with Mexico Amending the Agreement of November 9, 1972, as amended (T.I.A.S. 7697, 9436) Concerning Frequency Modulation Broadcasting in the 88 to 108 MHz band. Effective by exchange of notes at Mexico October 2 and 11, 1979. Entered into force October 11, 1979. (No. T.I.A.S.)

Egypt Project Grant Agreement with Egypt for Improvement of Egyptian Telecommunications System, with Annex. Signed at Cairo August 29, 1979. Entered into force August 29, 1979. (No. T.I.A.S.)

Agreements (Multilateral)

Convention on Registration of Objects Launched into Outer Space. Done at New York January 14, 1975. Entered into force September 15, 1976. T.I.A.S. No. 8480. Ratification deposited: Federal Republic of Germany, October 16, 1979.

Final Acts of the World Administration Radio Conference for the Planning of the Broadcasting-Satellite Service in Frequency Bands 11.7-12.2 GHz (in regions 2 and 3) and 11.7-12.5 GHz (in region 1), with annexes. Done at Geneva February 13, 1977. Entered into force January 1, 1979. (Not in force in U.S.) Approval deposited: Canada, June 20, 1979, Czechoslovakia, August 9, 1979.

United Nations

U.N. Comm. on the Peaceful Uses of Outer Space, Coordination of Outer Space Activities within the United Nations System: Programmes of Work for 1980 and 1981 and Future Years, Doc. A/AC.105/242 (1979).

U.N. Comm. on the Peaceful Uses of Outer Space, International Implications of New Space Transportation Systems, Report by the Secretariat, Doc. A/AC.105/244 (1979).

U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Legal Subcommittee on the Work of its Nineteenth Session, 10 March-3 April 1980, Doc. A/AC.105/271 (1980).

U.N. Comm. on the Peaceful Uses of Outer Space, Report of the Scientific and Technical Sub-Committee on the Work of its Seventeenth Session, 28 January-13 February 1980. Doc. A/AC/105/267 (1980).

U.N. Comm. on the Peaceful Uses of Outer Space, Review on National and Cooperative International Space Activities for the Calendar Year 1979, Note by the Secretariat, Doc. A/AC.105/264 (1980).

U.N. Secretary General, Report on Coordination of Outer Space Activities within the United Nations System: Programmes of Work for 1979 and 1980 and Future Years, Doc. A/AC.105/223 (1978).

U.N. Secretary General, Report on Establishment of an Agency or a Department of the United Nations for Undertaking, Coordinating and Disseminating the Results of Research into Unidentified Flying Objects and Related Phenomena, Doc. A/33/268 (1978).

U.N. Secretary General, Report on Question of Convening a United Nations Conference on Space Applications, Doc. A/AC.105/Add. 15 (1978).

U.S. Congress

U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space, Science and Applications concerning Authorization of FY 80 Appropriations for NASA Programs, 96th Cong., 1st Sess. (1979).

U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space Science and Applications concerning 1980 NASA Authorization, 96th Cong., 1st Sess. (1979).

U.S. House Comm. on Science and Technology, Hearings Before the Subcomm. on Space Science and Applications concerning Solar Powered Satellites, 96th Cong., 1st Sess. (1979).

U.S. House Comm. on Science and Technology, Hearings Before Subcomm. on Space Science and Applications concerning International Space Activities, 1979, 96th Cong., 1st Sess. (1979).

U.S. Sen. Comm. on Commerce, Science and Transportation, Hearings Before the Subcomm. on Science, Technology and Space: concerning U.S. Civilian Space Policy, 96th Cong. 1st Sess. (Jan. 25, 31 and Feb. 1, 1979).

U.S. Senate Comm. on Commerce, Science, and Transportation, NASA Authorization for Fiscal Year 1980, S. Doc. No. 357, 96th Cong., 1st Sess. (1979).

U.S. Senate Comm. on Commerce, Science, and Transportation, Hearings Before the Subcomm. on Science, Technology, and Space on S. 663 and S. 875 concerning Operational Remote Sensing Legislation, 96th Cong., 1st Sess. (1979).

D. Miscellaneous

T. Cheston and D. Webb (eds.), *The Space Humanization Series*, (The Institute for Social Science Study of Space, 1979).

Cooperation or Confrontation in Outer Space, Thirteenth Conference on the United Nations of the Next Decade (Stanley Foundation, 1978).

Scoville, Jr. and Tsipis, *Can Space Remain a Peaceful Environment?*, (Occasional Paper 18, Stanley Foundation, 1978).

Taylor and Frances, *Outer Space: Battlefield of the Future?*, (Stockholm International Peace Research Institute, 1978).

Tsipis. US-USSR Confrontation or Cooperation in Space (Nineteenth Strategy for Peace Conference Report 13, Stanley Foundation, 1978).

International Institute of Space Law of the International Astronautical Federation, Proceedings of the Twenty-Second Colloquium on the Law of Outer Space, Sept. 16-22, 1979, Munich, Germany (Am. Inst. of Aeronautics & Astronautics, New, N.Y., 1980). Included in the proceedings are:

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