PROCEEDINGS

United Nations/International Institute of Air and Space Law Workshop

on

CAPACITY BUILDING IN SPACE LAW

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Foreword

The proceedings of the Workshop on Capacity Building in Space Law have been produced in printed and electronic format.

The printed version contains all papers submitted to the Office prior or immediately following the conclusion of the workshop. Due to reproduction limitations, power point presentations could not be incorporated.

This CD-ROM contains the full proceedings of the workshop, including power point presentations.

Introduction

The Workshop on Capacity Building in Space Law, coordinated by the United Nations and the International Institute of Air and Space Law and hosted by the Government of the Netherlands, was held between 18 and 21 November in The Hague, Netherlands.

A continuous increase in space activities and a broadening participation in space activities means that space laws, policies and institutions are becoming a priority for a greater number of countries worldwide. It has also highlighted the need for the ratification and effective implementation of the five United Nations treaties on outer space.

The Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space (UNISPACE III) called for action to promote the development of space law to meet the needs of the international community. The Conference emphasized the importance of the United Nations treaties on outer space and invited States that had not yet done so to ratify or accede to the treaties.

A recent review by the Committee on the Peaceful Uses of Outer Space and its Legal Subcommittee has revealed that one of the likely reasons for the low level of ratification of some of the treaties is a lack of awareness of the benefits of adherence to the outer space treaties. In addition, the actual adherence in practice by some States to the provisions of the treaties to which they are parties, and their implementation at the domestic level, has also been found to be in need of improvement.

The need for effective laws and policies on space activities, not just on an international level but also on the national level, is becoming clear to the increasing number of States now actively involved in the field of space. The successful operation of space law, policies and institutions in a country relies on the presence of suitable professionals. Therefore, educational opportunities and institutions that address the subject of space law and policy are also important.

Finally, the Action Plan of the United Nations Strategy for an Era of Application of International Law calls on every office, department, programme, fund and agency of the United Nations, to "review its current activities and consider what else it might do, within its existing mandate and given existing resources, to promote the application of international law, and to provide technical assistance to help Governments implement their commitments under the treaties to which they are or might wish to become parties."

The Workshop provided an overview of the United Nations treaties and principles on outer space, examined and compared various aspects of existing national space laws and considered the development of university level studies and programmes in space law. This multi-levelled approach to capacity building in space law sought to increase knowledge and awareness of the international treaties and principles developed under the auspices of the United Nations relating to space activities and to provide a basis for their implementation on a practical level through the development and administration of domestic legislation and regulatory regimes.

The objectives of the Workshop were:

(a) to promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space;

(b) to promote exchange of information on domestic space laws and policies, for the benefit of professionals involved in the development and implementation of those policies; and

(c) to consider development of university level studies and programmes in space law, with a view to promoting national expertise and capability in this field.

The Workshop identified suitable approaches and possible priority areas for different countries, sources of technical assistance for developing countries and identified means of generating the interest of high-level policy makers. Presentations were made on the situation in the participants' countries with a view to devising strategies for encouraging high-level policy makers to set the process of accession to the outer space treaties into motion and to identify priority areas for national space law and education in space law.

At the opening of the Workshop on Capacity Building in Space Law, introductory statements were made by representatives of the Ministry of Foreign Affairs of the Netherlands, the Permanent Court of Arbitration and the United Nations Secretariat. The workshop comprised three sessions, each focusing on a different issue relating to space law and education. Presentations by invited speakers on the international legal regime for outer space, national space laws and educational programmes in space law were followed by round-table discussions. Thirty-eight papers were presented by invited speakers from both developing and developed countries.

The sessions of the Workshop focused on (a) the international regime for outer space; (b) national space laws; and (c) educational programmes in space law.

PowerPoint presentations and other materials for the workshop are available on-line at the workshop's web site: http://www.oosa.unvienna.org/SAP/act2002/spacelaw/index.html

CONTENTS

Session 2: National space laws

Opening Statement

F.A.M. Majoor
Netherlands Ministry of Foreign Affairs

Dear participants,

On behalf of the Netherlands Government, I would like to welcome you to the United Nations Workshop on Capacity Building in Space Law. The Netherlands is delighted that we were given the chance to host this workshop in close co-operation with both the *United Nations Office for Outer Space Affairs* and the *International Institute of Air and Space Law*. What better place could have been chosen to discuss such a global issue than The Hague, a city with a strong tradition in international law exemplified by, among others, the International Court of Justice, the International Criminal Court, the Yugoslavia Tribunal and the Permanent Court of Arbitration?

This workshop will focus on three objectives important for the further development of space law.

The first objective is to promote understanding, acceptance and implementation of the United Nations treaties and principles on outer space. The Netherlands has always underlined the importance of these treaties and is among a small group of countries that have ratified all five existing treaties. We hope this workshop will once more emphasise the importance of a strong and comprehensive legal framework for space activities, and that it will give an extra impulse to the growing number of nations signing and ratifying these treaties.

The Netherlands considers space activities not only as a means to explore the universe around us, but also as a tool to tackle social, economic and political problems in fields like climate, water-control and vegetation and to promote economic growth and security. Space activities are important for all countries, including the developing countries. National governments have for long been the main sponsors of these activities, but more and more space activities are undertaken by private companies, especially in the fields of broadcasting and telecommunications. However, as most of you know, the existing outer space treaties deal almost exclusively with national governments. The provisions on liability, especially, have triggered a complicated discussion on when a country is a 'launching State', and how private entities can be assigned their proper share of liability if it should ever come to an accident. I expect that this workshop will provide an excellent opportunity to continue this discussion.

In a high-cost sector such as space, with an ever-present chance, however small, of incidents with potentially devastating impact, governments want to manage these risks in a responsible way. At the same time they want to promote private activities in space. These potentially conflicting aims can only be dealt with by establishing national space legislation.

This brings us to the second objective for this workshop, namely to promote exchange of information on domestic space laws and policies. This will assist professionals like you in the development and implementation of space legislation. Some ten countries have already made domestic space law. They include developing countries like Brazil and countries in transition like the Russian Federation and Ukraine. The Netherlands has also recently started to investigate the need for such legislation as a result of developments like the launch of a commercial satellite by the Netherlands-based company New Skies.

Extensive exchange of information will not only help domestic policy-makers and legislators; it also provides an opportunity for ensuring compatibility in various domestic space laws and for avoiding regime shopping and distortion of competition. For the Netherlands, creating a level playing field is the basis for all domestic legislation on space affairs. The United Nations treaties and principles on outer space will be a helpful framework for this effort.

The last objective in this workshop is to consider further the development of university level studies and programmes in space law, with a view to promoting national expertise and capability in this field. Increasing knowledge on the subject of space law will further develop our capacity to deal with the issues surrounding national laws and policies. Outer space is in some ways like the open sea, so it's appropriate that this workshop takes place in the country of Hugo de Groot, who founded the tradition of 'mare liberum' and maritime law in the seventeenth century. Together we can explore the best ways to build on this glorious tradition and develop this new academic field in the university, in government and in other institutions.

This four-day workshop will address all of these objectives in a variety of ways. The Netherlands government is very interested in the outcome. We hope it will contribute to our capacity in space law, especially now that we are working on our own legislation. Beyond that, the outcome of this workshop will be of interest to many more policy makers and professionals who are dealing with a sector that is becoming ever more complex and global and which is ever more in need of a strong legal basis.

Thank you!

Resolving Outer Space Related Disputes

Tjaco T. van den Hout
Secretary-General of the Permanent Court of Arbitration

Introduction

The importance of the space industry is undeniable. It has produced tools that are transforming our world, from environmental protection and telecommunications to humanitarian assistance, education, medicine and agriculture.[1] The global space industry has become one of the largest industries in the world, with an estimated US$ 90 billion in revenue, growing at an annual rate of 20%, and employing more than 800,000 people worldwide.[2] Much of this growth is attributable to private enterprise, governments being unable in recent years to make the sort of financial commitment required for space projects.

The participation of these private enterprises raises some interesting and important questions. What rules govern the activities of these enterprises, and how does one define the relationship between these enterprises and States? In the event of disputes between these enterprises and States, what sort of dispute resolution mechanisms ought to be applied?

Commercial Space Activity

The advent of private enterprise has led to astonishing leaps in technological application while simultaneously complicating issues of liability and responsibility. New technologies have led to the design and development of several new satellite systems such as the global mobile personal communication services [via satellite] or GMPCS[3] (also known as low Earth orbit satellite systems), financed and operated by private consortia. The development of these new systems, and the privatisation of most State owned or operated telecommunication operations,[4] has raised new issues as to responsibility and liability, and this in itself raises several questions. What should be the basis of regulation of the satellite industry? Should it be regulated by private contractual considerations, national laws or international treaties, or by an amalgam of the three? Can the existing dispute resolution mechanisms cope with the inevitable conflicts that will arise?

At the 41st session of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space, it was noted that although the existing outer space treaties

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1 Message of U.N. Secretary-General Kofi Annan, World Space Week, 2001.

2 *Source,* ASSOC. ADM´R FOR COMMERCIAL SPACE TRANSP., FED. AVIATION ADMIN, U.S. DEPT OF TRANSP., THE ECONOMIC IMPACT OF COMMERCIAL SPACE TRANSPORTATION ON THE U.S. ECONOMY (2001).

3 The GMPCS operations and services are not regulated by treaty, but by private contractual arrangements, national laws and broadband guidelines drafted as a result of the International Telecommunication Union (ITU)'s first world telecommunications policy forum in 1996: The Global Mobile Personal Communication Services Memorandum Of Understanding (GMPCSMOU). This document has been signed by more than 125 entities including administrations, telecom system operators, and equipment manufacturers. With the advent of the GMPCS, satellite systems have evolved from national and regional to global in reach, and from state owned and operated systems to privately financed and operated systems. The legal regime is quite different from that of the treaty based international, intergovernmental satellite operators and service providers. *See*, Sylvia Ospina, *International Satellite Telecommunications: Regulation by States or by Private Parties?,* 25 J.AIR & SPACE L. 273–280 (2000).

4 There is a trend towards privatization of satellite systems resulting from bilateral/multilateral efforts. For example INTELSAT was privatized in 2001. For more information on this, *see*, (http://www.intelsat.int/news/releases/press_f/2000/2000-26f.asp).

continue to serve as a sound basis for space activities, the rapid evolution of technology and the increasing commercialisation of space activities has made it necessary to identify mechanisms to strengthen the existing legal framework governing the peaceful uses of outer space.[5] Regardless of the fact that States are at different stages in the development of space technology, it is important to have some sort of uniformity in the rules regulating activities in the space industry. The recent United Nations Workshop on Capacity Building in Space Law highlighted the efforts being made by States in the development of national legislation, and the need for more effort to be made in this area.

Considering the extra-territorial nature of outer-space activity, international bodies such as the United Nations have an important role to play in drafting suitable rules and guidelines for the regulation of the global space industry. Already, the International Institute for the Unification of Private Law (UNIDROIT) has done a lot of work in this field. Motivated by the problematic nature of the raising of finance for space activity, largely resulting from the astronomical amount of money involved and the change in profile of the typical customer for space finance, UNIDROIT has attempted to provide a uniform, predictable and commercially oriented regime governing the taking of security in international mobile equipment.[6] The Convention on International Interests in Mobile Equipment and the preliminary draft Space Protocol[7] establish clear, substantive and commercially oriented rules to govern the financing of the acquisition and use of space property. Its objective is to increase the willingness of financiers to lend funds for commercial space transactions, thereby bringing benefits to customers for satellite services.[8]

Dispute Resolution

With the advent of private enterprise into the space industry, issues of liability and responsibility have become more complicated, and there is a need to strengthen existing dispute resolution mechanisms in order to make present developments controllable.

In designing dispute settlement procedures, it is important to consider preventive and control objectives and assess foreseeable problems along with uncertainties of new and untried or partially tried technology.[9] For example, with the increase in the population of satellite systems in outer space,[10] there is a foreseeable problem of congestion, and with it a struggle for the sparse frequency spectrum vital for the operation of any telecommunication system, thereby creating a fertile ground for conflict.

One should also not forget that this increase is accompanied by the problem of space debris, an issue on which it is important to have clear and unambiguous legal rules,[11] in view

[5] U.N. COPUOS Legal Subcomm. 41st Sess., available at (http://www.oosa.unvienna.org/Reports/AC105_787E.pdf).

[6] Martin Stanford/Alexandre de Fontmichel, *Overview of the current situation regarding the preliminary draft Space Property protocol and its examination by COPUOS,* available at (http://www.unidroit.org/english/internationalinterests/bibliography/articles/space/stanford2001-e.pdf).

[7] Convention on International Interests in Mobile Equipment, Cape Town 2001, available at (http://www.unidroit.org/english/conventions/mobile-equipment.pdf). Text of the draft Space Protocol is available at the UNIDROIT web site at (http://www.unidroit.org). For a discussion on the preliminary draft protocol, see *infra*.

[8] *Supra*.

[9] Harry Almond, *Disputes Disagreements And Misunderstandings Alternative Procedures For Settlement Claims Processes In Outer Space,* in Proceedings of the 36th Colloquium The Law of Outer Space (Amer. Inst. Of Aeronautics and Astronautics, 1993).

[10] *See* Maureen Williams id.

[11] More than 8,500 objects have been identified. These objects could be classified as space debris, and consist of old or out-of-order satellites and fragments of man-made origin.

of the potential for widespread damage to the outer space and Earth environment.[12] Damage caused by space debris to the outer space environment is clearly a problem that involves the necessity of prevention as well as a comprehensive, substantial body of rules, including mechanisms for dispute settlement, over the details of liability and responsibility. The Liability Convention does not expressly cover such damage; [13] nonetheless some commentators have argued that the wording of the Convention is sufficient to impute such coverage.

Procedural mechanisms for the solution of disputes arising from outer space related activity in the form in which they are likely to arise should not be exclusively governed by public international law, but should also contain elements of private international law. Legal problems arising out of space activities may concern substantive areas such as tort, contracts, environmental regulations, antitrust, taxation and so on,[14] and in addition to the public international law mechanisms of diplomatic negotiation, consultation and recourse to the International Court of Justice, the mechanisms should integrate to a greater extent more private means of dispute settlement, such as arbitration.

Most disputes arising from outer space related activity[15] seem well suited for resolution by alternative methods such as arbitration, as opposed to adjudication,[16] and indeed provisions of several multilateral agreements relating to specific areas of space activity have provided for the use of arbitration in the settlement of disputes, the INTELSAT[17] and INMARSAT[18] agreements being prime examples. The use of adjudication on the other hand is limited, although there is one example contained in the agreement relating to the Arab Satellite Communications Organization (ARABSAT).[19]

With the increasing number of private enterprises engaged in space activity, it would be in the best interests of all participants if a multilateral agreement could be reached establishing dispute resolution procedures for all space activity, including within its ambit

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[12] Ram Jakhu, *Emerging Legal Issues Of Satellite Telecommunications And Broadcasting*, Proceedings of the 43rd Colloquium on the Law of Outer Space 428 (2000). IRIDIUM, a multi-national consortium that is in the process of liquidation is a case in point. It has been suggested that IRIDIUM's fleet be de-orbited and allowed to burn upon re-entry into the Earth's atmosphere. This may have grave consequences for the outer space as well as the Earth's environment. *See* Sylvia Ospina *supra* note 3.

[13] Convention On International Liability For Damage Caused By Space Objects (Liability Convention) March 29, 1972, entered into force September 1, 1972:
(http://www.oosa.unvienna.org/Reports/AC105_722E.pdf).

[14] I.H.Ph. Dierdericks-Verschoor, *The Settlement of Disputes: New Developments*, 26 J. Space L. 41, (1998).

[15] One of the reasons given for the non-inclusion of a clause referring to arbitration in the UNIDROIT Convention on International Interests in Mobile Equipment is the perceived "softness" of arbitration. The flexibility of the arbitral process is seen as a disadvantage, for the reason that arbitrators, unlike State courts, are not bound by the Convention and would be more amenable to interpretation of terms and compromise, thus making it less easy to evaluate risk .

[16] *See* Maureen Williams, *Ethics, Space Activities and the Law*, in Proceedings of the Forty-third Colloquium on the Law of Outer Space, (Amer. Inst. Of Aeronautics and Astronautics, 2000). In Dr. Williams' opinion, for private enterprises engaged in space activity, existing law provides a number of solutions, mainly within the field of international arbitration. See also Phillip D. Bostwick, *Going Private With The Judicial System: Making Creative Use Of ADR Procedures To Resolve Commercial Space Disputes*, 23 J. Space L. 19, 1995.

[17] Agreement relating to the International Telecommunications Satellite Organization "INTELSAT", August 20, 1971, Washington, 6 ATS 1973.

[18] CONVENTION ON THE INTERNATIONAL MARITIME SATELLITE ORGANIZATION (INMARSAT) with Annex and Operating Agreement (1976); as amended 1985; with Protocol (1981), available at (http://www.tufts.edu/departments/fletcher/multi/texts/BH688.txt).

[19] NANDASIRI JASENTULIYANA, INTERNATIONAL SPACE LAW AND THE UNITED NATIONS, 220-223, KLUWER LAW INTERNATIONAL, 1999.

State and private actors. In order for private parties to participate effectively in space activities, several defects in existing dispute resolution mechanisms provided by current or proposed space treaties have to be addressed.

These defects are enumerated as follows:

1. The lack of direct access by these enterprises to the dispute resolution mechanisms presently being utilised in the resolution of space related disputes;

2. The non-binding nature of the decisions of these mechanisms; and

3. The general lack of specialisation in the area of space law of existing binding dispute resolution mechanisms.

Where private parties must necessarily rely on the willingness and cooperation of States to assert their claims by diplomatic espousal or through negotiation among States, as is presently the case, many disputes that arise may not come for resolution under the procedures of the various treaties.

Private parties need to be able to participate independently in a dispute resolution mechanism, preferably one composed of individuals who are experts in the law of outer space[20], with the processes tailored specifically to disputes arising from space activity. They also need to have the confidence that regardless of whether or not the other party is a State or private party, the process will lead to a binding decision. Indeed, some progress has been made in actualising this, as can be seen from the work done by the International Law Association (ILA) on the draft Convention on the Settlement of Space Disputes.[21]

Existing binding dispute resolution mechanisms can be adapted and utilised for the resolution of outer space related disputes. Most international arbitral institutions have mechanisms in place to resolve a wide range of disputes. Nowadays, arbitral institutions traditionally tailored towards the resolution of private commercial disputes administer disputes in which one of the parties is a State or a State entity. Apart from these institutions, there are also institutions which are treaty based and are only concerned with disputes where one party is a State, State entity or international organization, such as the International Centre for Settlement of Investment Disputes[22] and the Permanent Court of Arbitration (PCA).[23]

These arbitral institutions are equipped with modern equipment and experienced staff capable of administering the arbitration. They also have well drawn up procedural rules to which States and private individuals may refer, and provide a ready and workable solution to the problem of direct access to dispute resolution mechanisms, encountered by private parties when confronted with a dispute with a State. As for the problem of expertise, using the PCA as an example, if called upon to administer resolution of an outer space related dispute, it would simply establish a competent panel, and if need be, nominate scientific experts to arbitrate the dispute, or advise the parties.

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[20] Gabrielle Kaufmann-Kohler, *Arbitration And The Need For Technical Expertise*, ARBITRATION IN AIR, SPACE AND TELECOMMUNICATIONS LAW (International Bureau of the Permanent Court of Arbitration. ed.).

[21] Report and Revised Text of a Draft Convention on the Settlement of Disputes Related to Space Activities, Report of the 68th Conf. Space Law Committee, International Law Association.

[22] International Centre for Settlement of Investment Disputes, established under the Convention for the Settlement of Investment Disputes Between States and Other States, October 14, 1966.

[23] Established by The Hague Peace Conference, July 31, 1899, The Hague, Netherlands. Reviewed October 1907, The Hague, Netherlands.

A unique feature of arbitrating under the auspices of a treaty-based institution is that the private party has the confidence of knowing that it is getting all the benefits of arbitration, while the State party is less likely to refuse to arbitrate under the auspices of an institution it was instrumental in creating.

Conclusion

Any dispute settlement mechanism will have to be acceptable to both States and private enterprises. Adjudication and arbitration are the obvious choices to ensure a binding settlement. It is expected that State and private enterprises engaged in space activity will turn to the established rules and institutions of arbitration that are being used in most other fields of commercial activity.[27] While disputes between private parties have been all but taken care of by commercial arbitration institutions, there still remains a gap in relation to disputes between States and non-States, which can be filled quite readily by the PCA and other such mechanisms.[28]

At this stage in the development of space law, it is important to develop case law from courts and arbitration tribunals in order to arrive at more definite interpretations of the complex relationships between the various space conventions, States and private enterprises.[29]

As the volume of activity in outer space increases, institutions, laws and procedures for the resolution of disputes will have to address the unique aspects of this field.[30] A delicate balance will have to be struck in order for the world to continue to benefit from the vast technical advancements of commercial enterprise while at the same time taking care to preserve outer space as "the common heritage of mankind."

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[24] International Centre for Settlement of Investment Disputes, established under the Convention for the Settlement of Investment Disputes Between States and Other States. October 14, 1966.

[25] Established by The Hague Peace Conference, July 31 1899, The Hague, Netherlands. Reviewed October 1907, The Hague, Netherlands.

[26] Hans Jonkman, *The Role of the Permanent Court of Arbitration in International Dispute Resolution*, Centennial Celebration of the Permanent Court of Arbitration.

[27] K.H. Bocksteigel, *Arbitration Of Disputes Regarding Space Activities*, Proceedings of the 36th Colloquium on the Law of Outer Space 136 (Amer. Inst. Of Aeronautics and Astronautics, 1993).

[2828] The United Nations Secretary-General Kofi Annan recognized the relevance of the PCA when he encouraged States, international organizations and private parties to utilise the services of the PCA, stating that the PCA would help fill the gaps concerning arbitrations involving private parties and States. See Kofi Annan, *Foreword* to the BASIC DOCUMENTS OF THE PERMANENT COURT OF ARBITRATION (1998) available at (http://www.pca-cpa.org/BD/foreword.htm).

[29] Peter van Fenema, *The Unidroit Space Protocol, The Concept Of Launching State, Space Traffic Management and the Delimitation Of Outer Space*, 18 J. AIR & SPACE L. 278, (2002).

[30] K.H. Bocksteigel, *Space Law-Changes And Expectations At The Turn To Commercial Space Activities*, 8 Forum Internationale 12, (Kluwer Publishers 1987).

Opening Statement

Petr Lála
United Nations Office for Outer Space Affairs

Mr. van der Zee, Ladies and Gentlemen:

It is my privilege to welcome you to the first United Nations workshop on space law in The Hague, which is being organized jointly with the International Institute of Air and Space Law, or IIASL, of Leiden University. I would like to begin by thanking our co-sponsors in The Netherlands who have made this event possible: the Netherlands Ministry of Foreign Affairs, in particular Mr. Ad Reijngoud, and IIASL, in particular Professor Frans von der Dunk. Both the Ministry and IIASL have been going the extra mile to make sure the workshop is a success, from providing hotels and living costs for a number of participants, to providing the excellent meeting facilities that we are enjoying today, to organizing events throughout the course of this week.

I believe that I can speak for all the participants in also thanking – in advance – everyone who has generously given their time to speak at this workshop. This is a valuable contribution to the legal assistance activities of the United Nations, and is greatly appreciated.

The United Nations has recently started putting into effect an action plan entitled "An Era of Application of International Law". Under this action plan, UN offices are encouraged to promote understanding and acceptance of international law relating to the particular subject matter they work with. Important components include: Encouraging participation in multilateral treaties; Assisting States in preparing the necessary implementing legislation; and Education.

This workshop is the first of a series of workshops that the Office plans to organize, with regional workshops expected in 2003 and subsequent years. The workshops, however, should be considered as part of a broader programme of technical assistance. In future, this could include arranging technical assistance for specific countries, on request.

With this in mind, I would like to discuss briefly what my Office hopes this workshop will achieve.

First, the Office hopes the workshop will increase understanding and acceptance of the United Nations treaties on outer space. As you may know, the Office serves as the Secretariat for the United Nations Committee on the Peaceful Uses of Outer Space, which reports to the General Assembly. This Committee developed five United Nations treaties on outer space: the historic Outer Space Treaty of 1967; the Rescue Agreement, the Liability Convention, the Registration Convention and the Moon Agreement. These treaties will be discussed in more detail by the speakers later this morning. Each year, and for many years, the General Assembly has urged States that have not yet become Party to these treaties to consider ratifying or acceding to them.

The Outer Space Treaty and other United Nations treaties on outer space establish a legal regime for outer space based on an unprecedented degree of international cooperation. The legal regime provides a number of concrete benefits to countries that become Party to the treaties, and many are relevant in practice to all countries, whether developed or developing, or whether "space-faring" or "non-space-faring". Increasing awareness of the United Nations treaties on outer space within national governments is therefore an important step towards further increasing their level of participation.

A second objective of this workshop is to consider various approaches to national space law. Many of the speakers at this workshop are involved in administering such laws, and I am sure there will be an interesting exchange of information on this subject.

The exact nature of a country's national space law will depend to a large extent on the nature of space activities carried out by the country and the policies it wishes to pursue. In this respect, I would like to bring to your attention a publication, "Space solutions for the world's problems" that the Office prepared for the World Summit on Sustainable Development, in cooperation with other United Nations entities. The publication outlines some of the ways in which space technology can help us work towards sustainable development goals.

A third objective of the workshop is to consider ways to ensure that opportunities for education in space law are as widely available as possible. Towards this, we are very fortunate to have here representatives from our co-sponsor, the International Institute of Air and Space Law of the University of Leiden, as well as a number of other excellent, existing programmes for space law education.

And for all these objectives, I hope this workshop will be able to identify a small number of specific and feasible actions that could be recommended to help build capacity in space law worldwide.

The Office for Outer Space Affairs would like to ensure this workshop is useful and relevant to you after you return to your countries or institutions. In particular, I believe that many of you will act as important sources of information for your countries. For this reason, several reference documents have been distributed at the workshop, including a compilation of existing national space laws, sample education curricula, and other studies and analysis prepared or provided by participants in this workshop or by the Office itself.

A number of legal texts are also available on the web site of the Office for Outer Space Affairs. These include not only the texts of the United Nations treaties, legal principles developed by the United Nations and other General Assembly resolutions, but also texts of national space laws, bilateral and multilateral agreements, and legal studies. You can find the Office's Web address (http://www.oosa.unvienna.org) on some of the information brochures that we have handed out today.

The Office has planned this workshop as part of a long-term initiative for technical assistance in space law. We look forward to staying in touch with as many of you as possible, and will do our utmost to meet any requests for information or requests to arrange technical assistance in the years ahead.

Thank you for listening; I look forward to a successful four days.

Introduction to the United Nations Treaties and Principles on Outer Space

Vladimír Kopal[1]

The present international law governing space activities is one of the contemporary legal systems relating to what has been called "global commons". During the lifetime of our generations, new areas have been opened for the activities of humankind, which have become important theatres of the newly developing international relations. These areas became subjects of concerns in the regulation of which practically all States, in spite of their unequal capacities, wish to play adequate roles. The present areas of global concern are, by the order of their contemporary development: Antarctica; outer space, including the Moon and other celestial bodies; and oceans, particularly the seabed and ocean floor. In addition, the Earth environment is also becoming a global common, as became evident from the United Nations conferences and the follow-up meetings devoted to this particular subject at Stockholm, 1972, Rio de Janeiro, 1992, Johannesburg, 2002, and elsewhere.

All these newly opened areas of human activities have offered vast opportunities, but at the same time new problems and responsibilities have also emerged. These opportunities and related issues, however, are not equal in each of these areas and the world community did not decide to cope with them jointly by an attempt to establish a single legal regime which would be valid for all of them. Instead, specific legal systems have been developed for each particular area, though the necessity to do so emerged during the same historical period. In the process of establishing the individual regimes for each of the global commons and in the actual results of these efforts, it is possible to identify a number of similarities. But due to the different nature of the problems and interests involved, and as a consequence of negotiations on these issues at different fora, it is also necessary to observe significant differences in the solutions adopted during the elaboration of each of the legal systems. Therefore, either during the negotiations on the regulation of the different categories of activities, or in the process of application of the respective instruments, a mechanical transfer of the solutions from one special area to another has been impossible.

The purpose of this introductory paper is to offer an assessment of the up-to-date international space legislation as accomplished in the framework of the United Nations and enshrined in a series of space treaties and sets of principles. However, in dealing with the subject of sources of the present space law, we must bear in mind that the regulation of space activities consists of, and is growing in, two layers of legal norms:

The first layer is represented by the international law of outer space that governs the space activities of international persons, i.e. States and international intergovernmental organizations, which also create this law.[2] The essential part of international space law has been established within the United Nations. In addition to it, though, a growing number of bilateral and multilateral treaties of different kind, mostly dealing with international cooperation and individual projects thereof, have been concluded between two or more States and international organizations during recent decades.[3] Besides the United Nations, other

[1] Professor of International Law, Doctor of Sciences, Faculty of Law, University of Pilsen, Czech Republic; Chairman, COPUOS Legal Subcommittee, United Nations; IAF General Counsel and IISL Vice-President. The observations included in this paper reflect the views of the author and should not be necessarily attached to the institutions in which he is active.

[2] Individuals, which are now mostly recognized in theory and practice as the third category of international law persons in specific limits, have not yet played an active role in the field of establishing international space law. However, this may change in the future.

[3] As a recent example of such treaties, the Agreement among the Government of Canada, the Governments of ESA Member States, the Governments of Japan, the Russian Federation, and the USA

international organizations of the United Nations system, such as ITU, UNESCO, FAO, WMO, IMO, WIPO and IAEA contribute to the development of space law within the scope of their particular functions. Valuable is also the active participation of a number of organizations outside the UN system, in particular that of the European Space Agency, Intelsat, Inmarsat (now the International Mobile Satellite Organization – IMSO), Intersputnik, Eutelsat, Eumetsat and others. The constitutional documents establishing these organizations and providing for their legal development, too, have contributed to the growth of international space law.

The second layer of the legal regulation of space activities has been developing particularly during the recent period by means of national laws adopted by individual space-faring States. They govern the activities of these States and their space agencies, implement the principles of international space law at the level of domestic legal orders, and also regulate the activities of their nationals, both physical and juridical persons. To date, only some States have adopted their own space laws, but the significance of national regulations has been increasing simultaneously with the growing involvement of non-governmental entities in different space projects.[4] Nevertheless, national laws, as well as the activities of private entities performing them under the control and jurisdiction of individual States, ought to remain in full conformity with international obligations of the authorizing States arising from international space law.

Our attention will now concentrate on the role and activities of the United Nations in the establishment of international space law as a special system within the present international law.

FOUNDATIONS OF INTERNATIONAL SPACE LAW BY UN SPACE TREATIES

The space legislation in the United Nations has been developed by the Committee on the Peaceful Uses of Outer Space (COPUOS), which was established, first as an *Ad Hoc* body, by General Assembly resolution 1348/XIII of 13 December 1958. One year later, by resolution 1472/XIV of 12 December 1959, this body was transformed into a permanent organ of the General Assembly. During its existence, the membership of the Committee was expanded several times and by its present number (65 States), the COPUOS includes approximately one-third of the whole UN membership.[5] Since the early 1960s, COPUOS has become the focal point for all space-related cooperative programmes furthered by the United Nations. Two subcommittees, one Legal, the other Scientific and Technical, each composed of the same Member States as the parent body, were created for detailed consideration of specific proposals and suggestions concerning scientific, technical and legal problems submitted by

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concerning Cooperation in the Civil International Space Station, done on January 29, 1998, may be mentioned. See its text with related documents in Karl-Heinz Böckstiegel, Marietta Benkö and Stephan Hobe, Space Law, Basic Legal Documents, Vol. 2/1, D.II.4.1 (Installment 8, 2002). As to an analysis of the resolution of the problems involved, see, e.g. A.V. Yakovenko, Sovremennye kosmicheskie proekty. Mezhdunarodno-pravovye problemy. (Contemporary Space projects, International Law Problems), Moskva, 2000, p. 16 et seq.

[4] As to the existing national space laws and to current plans for national space laws, see Needs and Prospects for National Space Legislation, Proceedings of the Project 2001 – Workshop on National Space Legislation, 5-6 December 2000, Munich, Germany, Part III, p. 79 et seq. and Part IV, p. 117 et seq.

[5] See General Assembly resolution 56/51 of 10 December 2001. The present composition of COPUOS is listed in the Report of the Committee on the Peaceful Uses of Outer Space, GAOR Official Records, Fifty-seventh Session, Supplement No. 20, A/57/20, C, p.1, Membership.

COPUOS members for the development of international cooperation in the field of space exploration for peaceful purposes.

In addition to the Member States, a number of international organizations, both intergovernmental and non-governmental, which are dedicated to the development of international space cooperation, have been granted the status of observers in the Committee and its subcommittees. In this way, the basis for a meaningful discussion on space issues has been widened. From among the specialized organizations of the UN system, the participation of the International Telecommunication Union (ITU) has proven to be very valuable, particularly when discussing the issues relating to the Geostationary Satellite Orbit. The European Space Agency, too, has been one of those actively participating organizations. Moreover, some non-governmental organizations, such as the Committee on Space Research of the International Council of Scientific Unions (COSPAR), the International Astronautical Federation (IAF), acting in the legal field through its International Institute of Space Law (IISL), and the International Law Association (ILA), have been granted observer status within COPUOS and participate regularly in its work.

Right in the beginning of COPUOS deliberations, an important decision was made which since then has characterized the working methods of this UN organ: the conclusions to be adopted by the Committee and both its subcommittees should be subject to agreement without need for voting.[6] It should be observed that COPUOS thus became the first UN body which started applying in its proceedings a principle that became later known as the rule of consensus and expanded in the practice of the United Nations and also in other international organizations. The application of this rule has had positive effects on the work of the Committee and its subcommittees, particularly during the first decades of their activities.

From the substantive point of view, COPUOS and its Legal Subcommittee, in which the consideration of legal aspects of space activities has been effected now for four decades, adopted the method of a progressive elaboration of appropriate space law instruments. The rule of law in outer space should thus be established not by a single, all embracing international convention, but step-by-step, by a number of legal instruments dealing with the most urgent problems of space activities. Moreover, the initial discussions in the Legal Subcommittee led to the conclusion that the first legal basis for space activities should be conceived rather in principles than in detailed rules, in order to reach the necessary agreement relatively soon.

The 1963 Declaration and the 1967 Outer Space Treaty

In this way, the founding space legislative document of the United Nations emerged as the 1963 Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, which was adopted in the form of a UN General Assembly resolution.[7] As such, the principles included in the 1963 Declaration had only a recommendatory value, but some States in the General Assembly, including both major space powers of that time, promised to honour them as legal rules.

The same approach was also maintained when the 1963 Declaration was being transformed into a legally binding instrument – The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. This important instrument, generally called The Outer Space Treaty (OST),

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[6] See the statement of the Chairman of COPUOS in Verbatim Records of the Ninth Meeting held on 29 March 1962, UN doc. A/AC.105/PV.93/1962, p. 3.

[7] See resolution 1962 (XVIII) adopted by unanimity on 13 December 1963. Its text in United Nations Treaties and Principles on Outer Space, United Nations, New York, 2002 (UN doc. ST/SPACE/11, p. 3 et seq.).

was opened for signature on January 27, 1967 and entered into force on October 10 of the same year. Needless to say that the 1967 OST became the most important source of international space law, enjoying the widest acceptance by the international community from among all the UN space treaties.[8] The OST also became one of the outstanding law-making treaties of the contemporary international law as a whole, which significantly contributed to its progressive development and codification in the meaning of Article 13 of the UN Charter. Being honoured in practice by all States, it is possible to affirm that its principles are now explicitly or tacitly recognized by the international community as a whole, thus forming a part of general international law. By the OST, an attempt was made at finding a balanced compromise between the common interests of all nations, the aims of humankind as a whole, and the interests of individual States as members of the world community and traditional subjects of international law.

The OST includes a number of important elements which imposed the characteristic features on the whole international space law of our times. It should be mentioned that the architects of the OST avoided making an explicit and perfect definition of the legal status of the new area. Instead, they agreed on the purpose and orientation of space activities by saying that "the exploration and use of outer space, including the Moon and other celestial bodies, shall be carried out for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development, and shall be the province of all mankind".

Furthermore, in its Article I the Outer Space Treaty also enshrined such significant principles as freedom in the exploration and use of outer space, freedom of scientific investigation in outer space and international cooperation in such investigation. It may be said in this respect that in establishing the legal regime for outer space, the OST followed the example of the legal regime of the high seas, which crystallized during centuries of struggles and has been characterized by a series of "freedoms of the seas". Moreover, it is hardly possible to overestimate the value of the principle of non-appropriation of outer space, including the Moon and other celestial bodies, by any means. It must be emphasized that the principles of non-appropriation, as enshrined in Article II of the OST, relate to outer space as a whole, no exception having been admitted, and therefore no part of outer space, including the Moon or any other celestial body, can be exempted from the impact of this principle.

Article III of the OST also has a fundamental meaning for the legal regime of outer space and activities developed in this area. In this provision the imperative of legality of activities in the exploration and use of outer space – "in accordance with international law, including the Charter of the United Nations" – is spelled out. Moreover, the necessity of keeping the peaceful character of such activities is emphasized "in the interest of maintaining international peace and security and promoting international cooperation and understanding". This provision should be read in conjunction with the preambular paragraph of the Treaty in which the States Parties to this instrument express their desire "to contribute to broad international cooperation in the scientific, as well as the legal aspects of the exploration and use of outer space for peaceful purposes".

In Article V, the OST has brought some principles concerning assistance to and rescue of astronauts, protection of their life and health, as well as their safe return home. In carrying on activities either in space or on celestial bodies, the astronauts of different nationalities themselves have been obligated to render each other all possible assistance.

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[8] The OST as well as the other space law documents were published in several editions by the UN Office for Outer Space Affairs in a booklet, which is now called United Nations Treaties and Principles on Outer Space. See its latest edition in UN doc. ST/SPACE/11, United Nations, New York, 2002. The OST is on p. 3 et seq. As of 12 April 2002, 97 States had ratified the OST and, moreover, 27 States had signed it. See Report of the Legal Subcommittee on its forty-first session, held in Vienna, from 2 to 12 April 2002, UN doc. A/AC.105/787, para. 28 on p. 6.

A special significance must be attached to the principle of international responsibility of States Parties to the Treaty for all national space activities, whether such activities are carried out by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions of the OST. This principle, included in Article VI of the OST, goes farther than the rules of the general international law relating to State responsibility. For by the declaration of responsibility that relates equally to State and non-State activities, and also by the requirement of authorization and continuing supervision of the non-governmental entities by the "appropriate" State, the States Parties to the OST assumed what is called in the doctrine of international law a direct responsibility, not only for their own space activities, but also for the activities of their non-governmental entities in outer space.

In Article VII, another far-reaching principle was established, that of international liability for damage. Each State Party that launches or procures the launching of a space object and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State or to its natural or juridical person by such object or its component parts on the Earth, in air space or in outer space. This was provided without hesitation and reservations which have usually characterized the process of negotiation on liability for damage in other legal fields. And a way for this principle to be applied directly at an intergovernmental level, without exhausting the local remedies, was thus opened.

These are but a few examples of the major input done by the OST as the main instrument of the progressive development of international space law. It should be underlined that these fundamental principles should govern all activities of the exploration and use of outer space to be performed in peacetime, including those of a military nature.

On the other hand, some issues were crossed over in the OST by half-way compromises and an appropriate regulation of some other problems has been totally missing in this instrument. In Article IV, for example, a dual system of space demilitarization was established. While the Moon and other celestial bodies should be used exclusively for peaceful purposes[9], in outer space *per se* only the non-placement in orbit around the Earth of nuclear weapons or any other kinds of weapons of mass destruction or stationing of such weapons in outer space in any other manner were banned. Unlike the Moon and other celestial bodies, outer space *per se* has thus been demilitarized only partially. At the time of conclusion of the OST, this solution was a significant step forward, but the danger of an arms race in outer space, as evidenced by later developments, has not been fully removed. Nevertheless, the inclusion of the agreed demilitarization clauses in the OST was a clear evidence that the principles of international space law as incorporated in the OST should be applicable to all space activities and that the architects of this instrument were well aware of a close relationship between the military and non-military aspects thereof.

Furthermore, while legalizing the freedom of exploration and use of outer space, including the Moon and other celestial bodies, as well as the scientific investigation thereof, the OST has not contained any explicit principle that would regulate economic activities, the purpose of which would be to exploit the space natural resources. At the time of elaboration of the OST, such problems still seemed to be too remote and were probably deliberately left aside.[10] Moreover, only some rudimentary elements relating to the position of international

[9] It is interesting to note that the 1959 Antarctic Treaty resolved a similar issue concerning the Antarctic area and probably inspired the drafting of Article IV of the OST in this respect. There is, however, a slight but not negligible difference between the analogical provisions of both instruments. While Article I of the 1959 Antarctic Treaty mentions the specific military measures to be prohibited as some examples*, inter alia,* the enumeration of the forbidden measures in the 1967 OST is exhaustive.

[10] In this connection, it is again possible to note that the 1959 Antarctic Treaty, too, does not include any provisions which should regulate economic activities in the Antarctic area. An attempt at bringing

space organizations have been made in the OST. And no special system of the peaceful settlement of international disputes has been provided under the Treaty regime, except of “appropriate international consultations” that should be effected in the case of possible interferences among the space activities of the States Parties to the OST.

Finally, one more significant feature which characterizes the 1967 OST must be mentioned. While it was possible to create specialized organizations for some other areas of international cooperation, such as the International Atomic Energy Agency (IAEA), the International Maritime Organization (IMO) and the International Civil Aviation Organization (ICAO), as well as the Sea-Bed Authority under the 1982 United Nations Convention on the Law of the Sea, in the field of space activities no specialized agency of the UN system emerged that would deal with international cooperation in all relevant space matters. Instead, the functions in this field have been left dispersed among several bodies and organizations with the focal role of COPUOS.

Other UN Space Treaties

The fundamental role of the OST was confirmed by the fact that some of its principles created the basis for further steps in the progressive development of outer space law. Four other UN space treaties were concluded during the period following the entry of the OST into force:

The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, briefly called the Rescue Agreement, which elaborated the principles of Article V of the 1967 OST; it was opened for signature on April 22, 1968 and entered into force on December 2 of the same year. As of 2002, it has had 88 States Parties and 25 signatures of other States.

The Convention on International Liability for Damage Caused by Space Objects, briefly called the Liability Convention, which elaborated the principles of Article VII of the 1967 OST; it was opened for signature on March 29, 1972 and entered into force on September 1, 1972. As of 2002, it has had 82 States Parties and 26 signatures of other States.

The Convention on Registration of Objects Launched into Outer Space, briefly called the Registration Convention, which elaborated the first principle of Article VIII of the 1967 OST; it was opened for signature on January 14, 1975 and entered into force on September 15, 1976. As of 2002, it has had 44 States Parties and 4 signatures of other States.

The Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, which has been based on the principles of the 1967 OST relating to the Moon and other celestial bodies generally or explicitly; it was opened for signature on December 18, 1979 and entered into force on July 11, 1984. As of 2002, it has had but 10 States Parties and 5 signatures of other States.[11]

This treaty-making process, however, stopped after the adoption of the last of these instruments, the 1979 Moon Agreement, which collected so far the signatures and ratifications

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such regulation was made later by the 1988 Wellington Convention on the Regulation of Antarctic Mineral Resource Activities, but it has failed to collect a sufficient number of ratifications.

[11] See the texts of these instruments in United Nations Treaties and Principles on Outer Space, p. 9 et seq., 13 et seq., 22 et seq. and 27 et seq. In addition to States, some international organizations made declarations on acceptance of the rights and obligations arising from some of the UN space treaties, namely: The European Space Agency as to the Rescue Agreement, the Liability Convention and the Registration Convention; the Eumetsat as to the Registration Convention; the Eutelsat as to the Liability Convention. For the status of adhesions, see the 2002 Report of the Legal Subcommittee, para. 28 on pp. 6-7.

of a relatively small number of States, notwithstanding that, like the other UN space treaties, it was adopted in the UN General Assembly by consensus. The main reason for the hesitation of a great number of States to adhere to the Moon Agreement, including almost all major space powers and all space organizations, seems particularly to be a dissatisfaction with the provisions of Article 11 of this instrument, which deals with the legal status of the Moon and its natural resources that have been declared as "the common heritage of mankind". The insertion of this principle and its partial elaboration in para. 7 of Article 11 do not satisfy either the technically advanced industrial nations, or most of the developing countries.

Yet, the provisional solution of this issue as it was adopted in 1979 seemed to be a reasonable compromise that enabled the finalization of a lengthy work on this instrument. Unlike the legal regime provided for the seabed and ocean floor beyond the limits of national jurisdiction in the 1982 United Nations Convention on the Law of the Sea, in which a detailed implementation of the common heritage principle, including a complex system of prospecting, exploration and exploitation has been incorporated, the legal regime of the common heritage of mankind with regard to the Moon and its resources has been conceived in Article 11 of the 1979 Moon Agreement only in very general terms. The Moon Agreement requires only the exploitation of the natural resources of the Moon to be governed by the future international legal regime, and its full establishment has been postponed until such exploitation is about to become feasible. In the equitable sharing of the benefits derived from the Moon resources, which was promised to be effected under the future regime for all States Parties, special consideration should be given not only to the interests and needs of the developing countries, but equally to the efforts of those countries which have contributed either directly or indirectly to the exploration of the Moon. Unlike the exploitation of the Moon resources, the exploration and the use of the Moon remain a right of all States Parties and, according to Article 6, the freedom of scientific investigation has also been preserved. The States Parties to the Moon Agreement have the right to collect and remove from the Moon samples of its mineral and other substances. They may also use mineral and other substances of the Moon in quantities appropriate for the support of their missions. And last but not least, the future legal regime for the exploitation of the Moon resources would not necessarily lead to the establishment of a special institutional machinery for its application as is the Seabed Authority provided in the 1982 UN Convention on the Law of the Sea, as reformed by the 1994 Agreement Relating to the Implementation of Part XI of the Convention[12], for Article 11, para. 5 of the 1979 Moon Agreement speaks only about "appropriate procedures" to be adopted.

Another reason of the dissatisfaction with the Moon Agreement might be caused by the prohibition of national appropriation by any claim of sovereignty, by means of use or occupation or by any other means. This principle, however, has just been a repetition of the same maxim which had been included in Article II of the 1967 OST. In Article 11, para. 3 of the Moon Agreement it has been elaborated by the following provisions: "Neither the surface nor the subsurface of the Moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the Moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the Moon or any areas thereof". Nevertheless, it is evident that this set of provisions would not hinder the establishment of manned and unmanned stations and installations anywhere on or below the surface of the Moon. Neither would they create any obstacles to the activities of the personnel, vehicles and equipment on the Moon and their free access to all areas of the Moon. The status of the missions to the Moon and of the stations on the Moon according to the 1979 Moon

[12] See these instruments in Division for Ocean Affairs and the Law of the Sea, Office of Legal Affairs, The Law of the Sea, United Nations, New York, 1997, p. 7 et seq. and 214 et seq.

Agreement was conceived closely to the concept of expeditions to and stations at Antarctica as enshrined in the 1959 Antarctic Treaty and in the actual practice which has been successfully applied in that area to date. The relevant regulation of economic activities on the Moon might be negotiated under the international regime to be established as such activities are about to become feasible.

The lack of support for the Moon Agreement has created a difficult problem, because a visible weakness exists in the up-to-date international legal system of outer space in this regard. The more so, since the provisions of the 1979 Agreement relating to the Moon should also apply to other celestial bodies within the solar system, other than the Earth, except insofar as specific legal norms enter into force with respect to any of these celestial bodies. Nevertheless, the 1979 Moon Agreement remains a part of the United Nations space law and the UN documents relating to the status and application of the UN space treaties speak always of "the five United Nations treaties on outer space".[13]

It should be recalled that the ratifications of the 1982 Sea Law Convention, in which a detailed implementation of the common heritage principle, including a complex system of prospecting, exploration and exploitation with a central role of the International Seabed Authority and its Enterprise, has been elaborated, also proceeded very slowly for years. But the main obstacles that hindered this process were removed in 1994 by an Agreement Relating to the Implementation of Part XI of the Convention in which the ways and means of how to carry the controversial part of the Sea Law Convention into effect were found. This method might be considered as an example of how to proceed with the issue pertaining to the 1979 Moon Agreement and an attempt to reach an agreement on the implementation of Article 11 of this Agreement, which would take into consideration all interests of different groups of States, might be initiated by informal consultations at an appropriate time in the future.

REGULATION OF SPACE ACTIVITIES BY SETS OF UN PRINCIPLES

Though the elaboration of further UN space treaties was discontinued after 1979, the work of COPUOS and its Legal Subcommittee in the progressive development of the legal regime of outer space was not interrupted. During the following period, sets of United Nations Principles adopted by the General Assembly became a suitable form for regulating some special categories of space activities for which the international community was not yet prepared to negotiate legally binding instruments. As of now, four such sets of principles have been worked out by COPUOS and its Legal Subcommittee, and declared by the UN General Assembly in its respective resolutions:

Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, briefly called the DBS Principles, which were adopted by resolution 37/92 on December 10, 1982;

Principles Relating to Remote Sensing of the Earth from Outer Space, briefly called the Remote Sensing Principles, which were adopted by resolution 41/65 on December 3, 1986;

Principles Relevant to the Use of Nuclear Power Sources in Outer Space, briefly called the NPS Principles, which were adopted by resolution 45/68 on December 14, 1992; and

Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of all States, taking into particular account the needs of

[13] See e.g. the 2002 Report of the Legal Subcommittee, p. 1 and 6 et seq.

developing countries, briefly called the Benefit Principles, adopted by resolution 51/22 on December 13, 1996.[14]

It must be admitted that the negotiation on the first of these sets of principles, namely the 1982 DBS Principles, was negatively influenced by ideological controversies of the cold war. The vote effected on its adoption was a retreat from the rule of consensus that should govern the decision making on space matters. But it should also be recalled that the decision by vote was not made in COPUOS or its Legal Subcommittee, which have been bound by the rule of consensus, but in the General Assembly under its own Rules of Procedure.

On the other hand, the 1986 Remote Sensing Principles seemed to be a successful achievement in which a fair compromise was found between the interests of the sensing States, i.e. the States possessing the necessary space capabilities, and the needs of the sensed States, including most of the developing countries.

The 1992 set of NPS Principles was but a limited achievement in space legislation. Some innovatory elements were brought into the regulation of this kind of activities, such as the storing of NPS objects in sufficiently high orbits after the operational part of their missions, the safety assessment and notification of reentry. The NPS Principles, however, must apply, according to the preamble of this document, only to “nuclear power sources devoted to the generation of electric power on board space objects for non-propulsive purposes, which have characteristics generally comparable to those of systems used and missions performed at the time of the adoption of the Principles”. Therefore, the Principles are not applicable to the NPS serving other purposes, including nuclear propulsion for long-distance flights into interplanetary space and to the celestial bodies of our solar system. The expected reopening of these Principles, which was promised to be effected no later than two years after their adoption, has been delayed several times.[15]

The final document of this series, the so-called 1996 Benefit Principles, mostly reflects the existing practice of international space cooperation and does not include new regulatory principles. While all States, particularly those with relevant space capabilities, should contribute to promoting such cooperation, particular attention should be given to the benefit and the interests of developing countries and countries with incipient space programmes.

These UN sets of principles also recall and elaborate some of the provisions of the 1967 Outer Space Treaty. However, having been inserted in General Assembly resolutions, they are usually not considered to be legally binding instruments. Nevertheless, they have also had a certain legal significance by establishing a code of conduct recommended by the UN General Assembly and reflecting the legal conviction of the present international community relating to these issues. Some authors even believe they spell out or elaborate customary rules of international law governing those activities.[16]

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[14] See the texts of the Principles adopted by the UN General Assembly in United Nations Treaties and Principles on Outer Space, p. 37 et seq.

[15] For several years, the issue of NPS was discussed by the Scientific and Technical Subcommittee under a multi-year work plan. A special Working Group of the Subcommittee produced a report entitled, “A review of international documents and national processes potentially relevant to the peaceful uses of nuclear power sources in outer space”, UN doc. A/AC.105/781. The Working Group should determine in 2003 whether or not to take any additional steps concerning this report. On its part, the Legal subcommittee still agreed at its 2002 session that “at this time, opening a discussion on revision of the principles was not warranted”. See the 2002 Report of the Legal Subcommittee, paras. 73 and 74 on pp. 11 and 12.

[16] For a more detailed analysis of the legal nature of the UN General Assembly declarations, see the views collected in D.J. Harris, Cases and Materials on International Law, Fifth edition, London, 1998, p. 58 et seq. See also Bin Cheng, United Nations Resolutions on Outer Space: ‘Instant’ International

THE ROLE OF UN SPACE CONFERENCES IN THE DEVELOPMENT OF SPACE LAW

A certain, though rather limited, role in the development of the UN space law was also played by the United Nations Conferences on the Exploration and Peaceful Uses of Outer Space. All these conferences were prepared by COPUOS, which either served as a preparatory committee itself, or established special bodies for this purpose.

At the first of these conferences, which was held at Vienna in 1968, just one year after the entry into force of the Outer Space Treaty and shortly after the finalization of the Rescue Agreement, one full session of the Conference was dedicated to legal issues of space exploration.[17] From the point of view of the organizational development, the initiation of the United Nations Programme of Space Applications should be also recalled.

Unlike the first UN Conference, the second one, which was held in 1982, did not provide a special forum for discussing legal aspects of space activities. Nevertheless, some serious political-legal problems were also raised during its deliberations. They concerned the maintenance of peace and security in outer space and the necessity of preventing an arms race and hostilities in outer space as an essential condition for the promotion and continuation of international space cooperation for peaceful purposes.[18] On the other hand, the 1982 Conference dedicated a major interest to an assessment of multilateral and bilateral cooperation and to recommendations for increasing the role of the United Nations system of organizations in these endeavours.[19]

The latest in the series of the UN conferences – the so-called UNISPACE III held in 1999 – was certainly the most interesting one from the viewpoint of the possibilities of a further development of space law. A full participation of non-governmental organizations, industry and academia in the programme of UNISPACE III by means of a Technical Forum provided a flow of ideas and initiatives which were then pondered by the official part of the Conference and influenced its final results. In the legal field, a Workshop on Space Law in the Twenty-first Century evaluated, in eight sessions, the most important sectors of the present legal issues relating to space activities.[20] Moreover, a Workshop on Intellectual Property Rights in Space, coordinated by the European Space Agency, and some other meetings also discussed legal topics and related aspects.

In the report of UNISPACE III, a special section of Part H, which deals with Promotion of international cooperation, concerns international space law, including the present status and

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Customary Law? in Indian Journal of International Law, 1965, p. 23 et seq.; V. Kopal, The Role of United Nations Declarations of Principles in the Progressive Development of Space Law in Journal of Space Law, Vol. 16, No. 1, 1988, p. 5 et seq., particularly pp. 17-20.

[17] See Space Exploration and Applications, Vienna, 14-27 August 1968, Vol. II, United Nations, New York, 1969, UN doc. A/CONF.34/2, p. 1101 et seq.

[18] See in particular paras. 13 and 14 of the Report of the Second United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 9-21 August 1982, United Nations, UN doc. A/CONF.101/10, p.5.

[19] Ibidem, p. 78 et seq.

[20] See Proceedings of the Workshop on Space Law in the Twenty-first Century, organized by the International Institute of Space Law with the United Nations Office for Outer Space Affairs. UNISPACE III Technical Forum, July 1999, United Nations, New York, 1999, UN doc. A/CONF.184/7.

issues and objectives in this field. "The Space Millennium: Vienna Declaration on Space and Human Development", which emerged from the deliberations of UNISPACE III as "the nucleus of a strategy to address global changes in the future", reaffirmed the role of COPUOS, its two subcommittees and its Secretariat in leading global efforts for the exploration and peaceful uses of outer space on significant global issues. Among other tasks, the Vienna Declaration recommended to promote the efforts of COPUOS in the development of space law (1) by inviting States to ratify or accede to, and inviting international intergovernmental organizations to declare acceptance of, the outer space treaties developed by the Committee, and (2) by considering the further development of space law to meet the needs of the international community, taking into particular account the needs of developing countries and countries with economies in transition.[21]

FURTHER POSSIBLE DEVELOPMENT OF INTERNATIONAL SPACE LAW IN THE UNITED NATIONS

It is evident that not all impending issues arising from the actual growth of space activities have been resolved thus far, some of them having been bridged by rather vague compromise provisions or even left out.

The attention was already drawn to the principle of international responsibility for national space activities which the States Parties to the 1967 Outer Space Treaty assumed, including their duty of assuring that all national activities are carried out in conformity with the provisions set forth in the Treaty. This important principle, which reflected one of the essential compromises opening the door to the final agreement on the 1967 OST, is and should remain valid. However, a number of questions have arisen in recent years in connection with the growing volume of space activities of private enterprises. Such entities now are or plan to be engaged in the space business not only as suppliers of space objects or instruments to States and State agencies, but also by launching their own objects and as operators of whole space systems. Moreover, the process of privatization of some international space organizations, which thus far have had an intergovernmental character, also raises some questions relating to this topic. These questions have been studied in light of the present space law and adequate answers should be provided in order to ensure a sound development of the commercial space business.[22]

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[21] See Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999, UN doc. A/CONF.184/6, 18 October 1999, p. 8.

[22] The item entitled "Commercial aspects of space activities" was discussed and a work plan for its implementation was submitted by Argentina during the informal consultations of COPUOS Legal Subcommittee on new items for its agenda. See Report of the Legal Subcommittee on the work of its thirty-eighth session, 1-5 March 1999, UN doc. A/AC.105/721, 30 March 1999, pp. 9 and 15. While some delegations supported that initiative, the view was also held that the scope of the item was too broad to allow for an effective, focused discussion leading to tangible results. See Report of the Legal Subcommittee on its thirty-ninth session, 27 March-7 April 2000, UN doc. A/AC.105/738, 20 April 2000, p. 13. At the non-governmental level, an exploratory project concerning these issues, called "Project 2001 – Legal Framework for the Commercial Use of Outer Space", was designed and accomplished by the Institute of Air and Space Law and Chair of International Business Law, University of Cologne, Germany, co-sponsored by DLR – German Aerospace Center. Six Working Groups were established and workshops relating to different aspects of that topic were held over the course of several years. The whole project, so far the largest one in the field of space law, culminated with an International Colloquium held in Cologne, 29-31 May 2001. See 'Project 2001' – Legal Framework for the Commercial Use of Outer Space, Recommendations and Conclusions to develop the present state of law, edited by Karl-Heinz Böckstiegel, Carl Heymanns Verlag KG, Köln, Berlin, Bonn, München 2002, XIV and 724 pp.

For years, many legal experts have been drawing attention to the fact that a significant gap exists in the 1967 OST and the other UN space treaties due to the lack of a suitable definition of "outer space" and a delimitation of airspace and outer space. Such a definition is still missing, notwithstanding that the UN space documents use the terms "outer space", "space activities", "space objects", etc., and attach to these terms important legal consequences. One of these is the fundamental difference between the legal regime of outer space, which is based on the principle of freedom of exploration and use of outer space (including the Moon and other celestial bodies), and the legal regime of airspace, the parts of which above the territories of individual States are subject to their complete and exclusive sovereignty. Although in practice it has become more or less clear where the area of outer space begins, attempts to adopt a legally binding delimitation between airspace and outer space, or at least to agree on a recommended interpretation of these notions, have failed. Also an explicit recognition of the right of passage for a space object of one State through the airspace of other States for the purpose of reaching orbit or returning to earth has not been achieved up-to-date. Nor has such a right been generally accepted as firmly established in customary international law. The attempts at bringing new light to consideration of these issues by studying the legal aspects of aerospace objects, which was undertaken in COPUOS' Legal Subcommittee in recent years, have not led thus far to any generally accepted conclusions.[23]

Under the scope of the same item "Definition and Delimitation", the Legal Subcommittee has been also occupied for years by discussions on the legal status of the Geostationary Satellite Orbit (GSO). The long-lasting exchange of views on these issues has mostly concentrated on the dilemma of whether the GSO is an inseparable part of outer space or a particular area to be governed by a special legal regime. Another issue relating to the GSO has been the question of the respective competence of COPUOS and the International Telecommunication Union (ITU) to deal with this subject. A certain progress was reached when the Legal Subcommittee managed to agree on a summary of the up-to-date discussions on the geostationary orbit. It was agreed upon that this question would still remain on the agenda of the Subcommittee, but it was no longer found necessary to discuss it in a special working group as in past years.[24] Moreover, at the forty-fourth session of COPUOS held in June 2001, the Committee agreed on the following statement: "The geostationary orbit, characterized by its special properties, is part of outer space". The Committee considered that "that agreement would facilitate possible future discussions of the geostationary orbit by the Scientific and Technical Subcommittee, which could then focus on the possible evolution of scientific knowledge and measures to increase the benefit of the geostationary orbit for all countries, in particular developing countries".[25]

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[23] Under the scope of consideration of this problem, a questionnaire on possible legal issues with regard to aerospace objects was elaborated in a special Working Group of the Legal Subcommittee which was addressed to Member States of COPUOS, and a number of replies were received. See UN doc. A/AC.105/635 and Add. 1-5, and UN doc. A/AC.105/C.2/L.204 which presented a "Comprehensive analysis of the replies to the questionnaire on possible legal issues with regard to aerospace objects" prepared by the Secretariat. At its 2002 session, the Legal Subcommittee endorsed the report of the Working Group on the subject of definition and delimitation, which included its recommendation that the questionnaire, as amended by the Working Group, should be circulated to all Member States of the United Nations. (See the 2002 Report of the Legal Subcommittee, para. 70 at p. 11 and para. 11 at p. 23).

[24] See Report of the Legal Subcommittee on its thirty-ninth session, 27 March-7 April 2000, UN doc. A/AC.105/738, 20 April 2000, Annex III, pp. 20-21.

[25] See Report of the Committee on the Peaceful Uses of Outer Space, GAOR, Fifty-sixth Session, Supplement No. 20 (A/56/20), para. 126 at p. 17.

In addition to regular items, some items on the agenda of the Legal Subcommittee now include issues to be discussed as so-called "single issues/items for discussion".[26] From among them, meaningful deliberations have been developed on the initiative of the International Institute for the Unification of Private Law (UNIDROIT), an intergovernmental organization based in Rome which established as its main objective to "examine ways of harmonizing and coordinating the private law of States and to prepare gradually for the adoption by various States of uniform rules of private law".[27] UNIDROIT prepared a draft Convention on International Interests in Mobile Equipment which was, after several years of negotiations, adopted at a diplomatic conference held in Cape Town, South Africa, in November 2001.[28] The Convention should be accompanied by three Protocols, namely a Protocol on Matters Specific to Aircraft Equipment, a Protocol on Matters Specific to Railway Rolling Stock, and a Protocol on Matters Specific to Space Assets. Whereas the first of these Protocols was already finalized and adopted together with the base Convention, and the second Protocol has been well advanced, the draft Space Protocol, prepared by a Space Industry Working Group,[29] has been transmitted, after a review by the UNIDROIT Steering and Revisions Committee, to governments with a view to convening a UNIDROIT Committee of Governmental Experts, which should examine this document before its submission to a diplomatic conference.

In COPUOS' Legal Subcommittee, the discussion on this item began at its fortieth session in 2001. In order to review all issues involved, it was agreed to establish an Ad hoc consultation mechanism[30], which held two special meetings, one in Paris, September 2001, the other in Rome, January 2002. The Ad hoc mechanism adopted a set of conclusions which confirmed that the Space Protocol was an important initiative that deserved the attention of States. The conclusions included a number of agreements, but they also recommended some issues for further consideration.[31] The Legal Subcommittee at its 2002 session decided to retain this item on its agenda for the 2003 session and recommended to concentrate on the considerations relating to the possibility of the United Nations serving as a Supervisory Authority under the Space Protocol and the considerations concerning the relationship between the terms of the draft Protocol and the rights and obligations of States under the legal regime applicable to outer space. For this purpose, a new Working Group should be established and the Secretariat should prepare a report on the issue of the role of a Supervisory Authority by the United Nations in consultation with the United Nations Legal Counsel.[32]

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[26] As to the present agenda structure of both subcommittees of COPUOS, which distinguishes between three categories of issues (regular items, single issues/items for discussion, and items considered under work plans), see Kai-Uwe Schrogl, A new impetus for space law making: The 1999 reform of UNCOPUOS and how it works, in Proceedings of the Forty-third Colloquium on the Law of Outer Space, October 2000, Rio de Janeiro, Brazil, p. 96 et seq.

[27] See Committee on the Peaceful Uses of Outer Space: Legal Subcommittee, 39th session: Vienna, 27 March-7 April 2000: The preparation by UNIDROIT of a new international regimen governing the taking of security in high value mobile equipment, in particular space property. Presentation by Martin J. Stanford, Principal Research Officer, UNIDROIT.

[28] See the text of the Convention in DCME doc. No. 74, 16/11/01. See also the Final Act of the Cape Town Conference, DCME doc. No. 76, 16/11/01.

[29] See its text in UNIDROIT 2002, Study LXXIIJ-doc. 3, Rome, January 2002.

[30] See the Report of the Legal Subcommittee on its fortieth session, 2-12 April 2001, UN doc. A/AC.105/763, 24 April 2001, para. 94 at p. 14.

[31] See the 2002 Report of the Legal Subcommittee, Annex III, at pp. 24-25.

[32] See the 2002 Report of the Legal Subcommittee, para. 137 at pp. 17-18. As to the assessment of the present stage of negotiations on the Space Protocol, see Paul B. Larsen, Future UNIDROIT Protocol on

The only issue on the agenda of the Legal Subcommittee that has, to date, been considered on the basis of a work plan and for which a working group was established, was "Review of the concept of the 'launching State'". The purpose of this work was to clarify during a three-year exercise from 2000 to 2002 all aspects of the concept of the "launching State" as contained in the 1972 Liability Convention and the 1975 Registration Convention, and as applied by States and international organizations, in the light of new and expected practices in space activities. In the conclusions of the Working Group, as approved by the Legal Subcommittee, not only were the proceedings of this group summarized, but also some important suggestions were recommended. They relate, *inter alia*, to national laws of States conducting space activities, which should authorize and provide continuing supervision of the activities of their nationals in outer space, and implement their international obligations arising from international agreements. The Working Group also recommended the consideration of harmonizing voluntary practices that would provide useful guidance in a practical context to national bodies implementing the United Nations treaties on outer space. However, the Working Group reminded that its conclusions did not constitute an authoritative interpretation of or proposed amendments to the Liability and Registration Conventions.[33]

At several of its sessions, the Legal Subcommittee also pondered proposals to COPUOS for new items to be considered by the Subcommittee at its further sessions. A number of new topics were suggested by different members of the Subcommittee or the groups thereof.[34] Some of them, however, were already withdrawn or postponed by their initiators. Four such proposals stand on the list after the last session of the Subcommittee, namely:

(a) Consideration of the appropriateness and desirability of drafting a universal comprehensive convention on international space law. This issue should be discussed as a sub-item under the item entitled, "Status and application of the United Nations treaties on outer space";

(b) Discussion on an international convention based on the Principles Relating to Remote Sensing of the Earth from Outer Space;

(c) Review of the Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting, with a view to possibly transforming the text into a treaty in the future;

(d) Review of existing norms of international law applicable to space debris.

The first of these suggestions, initiated by the Russian Federation and later on co-sponsored by a number of other States, might open the way to a codification of the international law governing space activities and also to its further development under the scope of such exercise. The second suggestion, co-sponsored by Brazil and Greece, is based on a belief that the development of a convention is necessary to update the 1986 Remote Sensing Principles and to develop rules for new situations resulting from technological innovations and commercial applications of remote sensing. The third suggestion, sponsored by Greece, would review the 1982 DBS Principles in the light of new developments and might implement the outcome of the work of the special Working Group of the Scientific and Technical Subcommittee on this

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Security Interests in Space Assets, 27 September 2002. Paper submitted to the 45th Colloquium on the Law of Outer Space, Houston, Texas, USA, October 2002.

[33] See the 2002 Report of the Legal Subcommittee, Part VIII at p. 16 and Appendix at pp. 28-31.

[34] They have been listed in the 2000 Report of the Legal Subcommittee, UN doc. A/AC.105/763, para. 118 at p. 17 and in the 2002 Report of the Legal Subcommittee, UN doc. A/AC.105/787, para. 138 at p. 18.

issue. And, the fourth suggestion might become the first step towards the consideration of legal aspects of protection of space environment against the risks of generation of space orbital debris.[35]

While the Legal Subcommittee at its last session in 2002 did not reach consensus on any new item, it agreed at least on widening of its regular item "Status and Application of the five United Nations treaties on outer space". Its title remains unchanged, but the Subcommittee agreed to establish a working group on this item. And its terms of reference now do not only relate to "the status of the treaties" as was the case during the past few years, but they also include "review of their implementation and obstacles to their relevant acceptance, as well as promotion of space law, especially through the United Nations Programme on Space Applications". Moreover, the Working Group on the Status of the UN Space Treaties should also review the application and implementation of the concept of the "launching State" as reflected in the conclusions of the former Working Group on this concept.[36]

COPUOS and its Legal Subcommittee stand now at a certain crossroads. They have to decide whether a way to a full development of space law for the 21st century should be opened, which would reflect the needs for traditional and new forms of space activities and of all its actors. There seems to be no doubt that the existing principles of international space law governing the activities of States and international intergovernmental organizations should be preserved and respected as the basis of the whole system of space law. But they could be accompanied by further international instruments regulating new issues arising from the present development of space activities and by national legislation of individual States, implementing and completing them with due account to the growing involvement of non-governmental entities in different space projects. In this way, space law, which now includes both the principles and rules of international law, and the rules arising from national space legislation, is becoming step-by-step a comprehensive legal system governing space activities of our times.[37]

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[35] This approach to the consideration of the legal aspects of space debris was initiated by the Czech Republic already in 1996. (See the Report of the Legal Subcommittee on the Work of its Thirty-fifth Session, 18-28 March 1996, UN doc. A/AC. 105/639, para. 56 at p. 12 and the unofficial background note by the Czech Republic at p. 38.) A considerable attention to "the pressing question of space debris, which was not specifically addressed in the existing treaties", was given during the deliberations of UNISPACE III at Vienna, 1999. Several speakers expressed concern about the lack of an adequate legal regulation of that issue and insisted that it was time for that issue to be placed on the agenda of the Legal Subcommittee. (See Report of the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space, Vienna, 19-30 July 1999, UN doc. A/CONF. 184/6, p. 81.) At the subsequent session of the Legal Subcommittee, this view was reiterated by several delegations. At the 41st session of the Subcommittee, an analysis carried out by ESA on the legal aspects of space debris was reported. (See UN doc. A/AC.105/C.2/2002/CRP.5.) In that discussion several delegations recommended that "it would also be highly desirable for a declaration of principles relating to the prevention of space debris to be drafted and adopted as soon as possible." (See the 2002 Report of the Legal Subcommittee, UN doc. A/AC.105/787, paras. 49-51 at p. 9.)

[36] See the 2001 Report of the Legal Subcommittee, UN doc. A/AC.105/763, para. 118 at p. 17. See also the 2002 Report of the Legal Subcommittee, UN doc. A/AC.105/787, para. 138 at p. 18.

[37] Space law is thus becoming a similar system as air law has been for a long time. As to the concept of air law, see I.H.Ph. Diederiks-Verschoor. An Introduction to Air Law, Seventh Revised Edition, Kluwer Law International, The Hague/London/New York, 2001, pp. 3-4.

The Liability Convention And Liability for Space Activities

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Introduction:

Activities in outer space are not ordinary activities.

They are not ordinary because they take place in a very special environment from a technical point of view. Outer space is not human friendly; space activities are "ultra hazardous activities".

They are not ordinary because they take place in a very special environment from a political and strategic point of view. Outer space is very sensitive in that respect.

They are not ordinary because they take place in a very special environment from the legal point of view. From the very beginning of space era, national activities have been conducted under special control from States.

Space States' responsibility and liability are a counterpart for the freedom of access in outer space.

When the USSR and the USA entered into space era, the legal status of outer space was not clear. According to traditional international law, the States' sovereignty applied to States' territory down the surface and above it "*usque ad caelum*" until the sky. A freedom of use of outer space was far from clear. It seems that, in order to obtain the recognition of this freedom, the two space States agreed to accept and recognise a very large responsibility and liability for any damage caused on Earth, i.e., to non-space-faring States.

The rules may be found in the Outer Space Treaty and in the Liability Convention. I will examine the system set in force by them. Of course I am not going to speak about this well-known mechanism before such an audience. I will just draw your attention to some special issues and open the way to discussion.

Very often, we hear that the liability regime of outer space is no longer up-to-date and should be changed. As I have argued many times, given the way we discuss within the COPUOS Legal Subcommittee, entering into a global modification of the system would be opening a Pandora's box. Instead of improving the current system we will destroy it. We would instead have to apply general, common, international law. We know how efficiently that works for the high seas!

Many times, criticism of the Liability Convention system results from the fact that some people expect too much from it. The fundamental aim of the Liability Convention is rather narrow: liability for damage to "innocent" victims, victims not taking part in the activity. For that purpose, I think the convention may be really efficient (I). It is far less efficient for damage to other space States' property (II) and not efficient at all in many other cases (III).

I The liability convention is very efficient for damage to victims on the Earth.

As we know, the liability of the launching State is quite uncommon within international law. We do not have such rules in any other field (not even for the activities of nuclear industry).

- The liability for victims not taking part in space activity, victims on the Earth, is objective; no fault has to be proven. This is of course of tremendous importance. It could be impossible for the victim to prove any fault for a rather secret activity conducted in outer space.

- The liability is unlimited in amount. Unlike accidents at sea or nuclear liability, there is no ceiling. This is also very important and equitable. When there is a ceiling, it means that the victim will only be indemnified up to this ceiling and that it will bear a part of the burden of the risk. This seems absolutely unfair if the potential victim has nothing to do with the activity.

- The liability is unlimited in time. When we consider activities which may last decades or centuries, this is an interesting point.

- The liability is absolute. No exoneration is possible. No act of God, no fault of a third party, not even a fault of the victim. Only "*gross negligence*" or "*an act or omission done with intent to cause damage*" may be exonerating. And something that seems even more to be rather astonishing: "No exoneration whatever shall be granted in cases where the damage has resulted from illegal activities conducted by a launching State" (article VI of the Liab. Conv.).

- The liability is global. The launching State liability applies to the whole activity. It applies from the launch of the rocket, i.e., in the ascending phase, it applies during the travel to orbit, it applies to the space object's life in orbit, and it applies to the stay in orbit until de-orbit a few centuries after. When France launches an Ariane rocket from Kourou, it will be liable for any damage caused during the launch but also for any damage caused by any payload on board.

- When there is more than one launching State (article V) or when two space objects are involved (article IV) the launching States are jointly and severally liable. That means that the State of the victim can ask for the whole compensation from any one of the launching States. Afterwards, the launching States will share the burden of compensation according to article IV or V respectively.

This liability may be considered as very heavy. In fact, it is. If we want to understand the *rationale* of the system, we can describe it as a mechanism organised to guarantee the "innocent" victim in case of an accident. In fact, given the current evolution of space activities, the Liability Convention does not deal with liability of *one* State, whichever it may be. It sets in place a global system able to guarantee compensation for the victim as far as the damage is caused to it by a space object.

Nowadays, in many cases, there is more than one launching State. So much the better for the implementation of the Liability Convention: the victim will have more chances to be thoroughly compensated.

What about the launching States? I would interpret the system the following way:

- On one side we have the victim and potential victims.

- On the other side we have a kind of a "*pool*" of States taking part in the activity of launching a space object. Together, they must guarantee indemnification if something goes wrong at any time during the activity. This is the aim and purpose of the Liability Convention. They are collectively liable for any damage even if each one of them is not involved in every distinctive phase of the activity. The State which procures the launch is not involved in the launch phase, and the State of territory is no longer involved in the project when the space object is in orbit; nevertheless they are collectively and "jointly and severally" liable toward the "innocent" victim for any damage at any time. That does not really mean they are individually liable for the damage at the time of the accident; it means that by taking part in the adventure they have accepted to take part in the guarantee mechanism. This does not mean that they will have to pay, but just that they will have to guarantee the victim. When there is more than one launching State, which State is going to pay *in fine*, to bear the burden of the cost of risk is not covered by the Liability Convention. The Liability Convention does not deal with the apportionment among the launching States of their financial obligations. Special agreements must be concluded in order to solve the problem. If the burden of liability seems too heavy to some States that are not very heavily involved in the activity, it is because they did not negotiate the agreements referred to in article V of this convention.

Thus, the liability mechanism is very efficient toward victims on Earth. This is not the case when the damage is caused to another space-faring State.

II The Liability Convention is far less efficient for damage in outer space.

The Liability Convention considers liability for damage caused by a launching State wherever it occurs. The distinction between damage on Earth and damage in outer space is only a detail. The fact that we have only one system for damage on Earth and for damage in outer space impedes the Convention. Both an objective and a fault-based liability cannot be set in the same system. Their logics or *rationale* are different; their rules should be different.

Let us have a look at two consequences of these shortcomings:

- **<u>Imputation of the liability.</u>**

In the case of an objective/absolute liability, this issue is fundamental – the law, here the treaty, must determine who is going to be liable. The Liability Convention does: it is the launching State. Very well, as far as an objective liability is concerned; but it is no longer convenient if a fault-based liability is involved. Then the rule "*res ipsa loquitur*" should apply. Facts only will speak and determine the liable entity. In the case of the Liability Convention the text sets this entity: the launching State will be liable, but only if its fault may be proven. As this does not apply to victims on Earth, but only to other space States, I have no major objection to that. A State or a private entity that conducts activities in outer space is aware of the risk it runs.

The problem is that, when a fault-based liability is concerned, it is an error to limit the liability to the launching State. In the case of damage to persons or properties on board another space object, the liability rule should consider the *State at fault* not the *launching State* (*res ipsa loquitur*). If the fault has not been committed by a launching State but by another State, the Liability Convention does not apply. In that case, the reference to the launching State is very counterproductive. For instance, the victim cannot use the Claims Commission mechanism. It would have been much more efficient for the Liability Convention to clearly distinguish between absolute liability and fault-based liability.

- **Joint and several liability in the case of a damage in outer space.**

Another difficulty arises from the interpretation of article V.1:

"*Whenever two or more States jointly launch a space object, they shall be jointly and severally liable for any damage caused.*"

The situation is clear for damage caused on Earth – objective liability applies – but what is the situation in the case of damage caused in outer space (fault-based liability)? Let us have an example. France and Germany are both launching States for a space object. Damage is caused to a Dutch spacecraft in outer space due to the fault of France. Can the Netherlands sue Germany for the damage?

According to article V.1, which applies to both types of liability (absolute and fault-based), it seems that the answer should be 'yes'. The "*joint and several liability*" applies to damage on the Earth and to damage in outer space.

In fact, I am not quite sure. First of all, it is not quite logical. Of course, in that case, after having paid compensation to the victim, Germany could afterwards present a claim for indemnification to France. Nevertheless the situation is not satisfactory. If the Netherlands sues Germany on the basis of a fault of France, how would the discussion on fault be carried out if France is not a party to the case?

My interpretation should be that "*joint and several*" liability usually applies to objective liability; in the case of fault-based liability, a *joint and several* liability can only exist if both persons involved are at fault. In order to clarify this point, I had a look at domestic law and especially at French penal law where, in some rare cases, we can find joint and several liability in the case of fault. If the liability is for fault, it may be *joint and several* but only in the case of a common fault of both. This is the case for a group of persons committing a crime together. (I would appreciate information on other legal systems on that point).

My interpretation would be: article V.1 does not apply if the fault is not common to both States, because in that case the launching State that has not committed a fault is not liable for the damage. Therefore, not being liable according to article III, it cannot be "jointly and severally liable" according to article V.1. Nevertheless, the text is not quite clear; article IV does not clarify the issue as it clearly indicates a joint and several liability in both cases.

In some other cases the Liability Convention simply does not apply.

III The domain of the Liability Convention is limited.

The Liability Convention applies only to a damage caused <u>by</u> a space object.

Will the launching State be liable for any damage caused by the object, including a failure of the space object (for instance if a satellite stops emitting a signal) or only by a physical contact of the object? An interpretation is necessary. The issue is important as we can see in the case of Galileo. Both are arguable, but considering the "rationale" of the system, I would prefer the narrower interpretation. This interpretation takes into consideration the fact that, even if the damage is caused on Earth, somebody using the signal sent by a space object is not a third party to the activity – they take part in it and take advantage of it. This interpretation confirms the fact that, when accepting the convention, the States parties had only in mind physical, mechanical damage and not an interruption of the space-related service.

The Liability Convention applies only to damage as defined in article 1: "*The term "damage" means loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations*" (at point (a)); In that respect, it does not apply to damage to the space environment or even to the Earth's environment. We have the same problem in other fields of international law: a damage caused to "humanity" as a whole cannot be indemnified, as humanity is not a legal person.

The Liability Convention of course applies to space debris, as to any space object, but only when the damage caused by the debris is one referred to in article 1. Thus, the fact of creating a space debris is difficult to consider as a damage in itself if no specific damage to property is caused.

The Liability Convention does not apply to people taking part in the launch.

The Liability Convention does not apply to damage caused to the launching State's nationals. This reminds us that we are currently dealing with international law. Therefore, a State cannot be sued by its own citizen. It does not apply either to foreign nationals involved in the launching operations. This exclusion confirms the opinion that the Liability Convention is especially set to protect "innocent" victims not taking part in this exciting but dangerous activity.

The Liability Convention does not deal with the sharing of the risks between launching States when, as it is currently common, more than one is involved. In its article V it only states that

1. Whenever two or more States jointly launch a space object, they shall be jointly and severally liable for any damage caused.

2. A launching State which has paid compensation for damage shall have the right to present a claim for indemnification to other participants in the joint launching. The participants in a joint launching may conclude agreements regarding the apportioning among themselves of the financial obligation in respect of which they are jointly and severally liable. Such agreements shall be without prejudice to the right of a State sustaining damage to seek the entire compensation due under this Convention from any or all of the launching States which are jointly and severally liable.

It is interesting to compare the rule of article IV, which considers damage caused by an accident involving two space objects and their launching States and article V, which deals with repartition of the burden of compensation between launching States of a space object.

Article IV.2 applies to States that have had no relationship before the accident, and thus states … "*the burden of compensation for the damage shall be apportioned between the first two States in accordance with the extent to which they were at fault; if the extent of the fault of each of these States cannot be established, the burden of compensation shall be apportioned equally between them.*"

Article V deals with the plurality of launching States for the same launch; it does not refer to the fault, but leaves the apportioning to agreements. It would be very wise for launching States to negotiate these agreements. In some cases, some launching States are very little involved in the launch; they should bear only a little liability, if any. This is, for instance, the case for States that lend their territory to some other States. I am thinking of my friends in Brazil, who are in this situation.

This is also the case if we consider the various periods of the life in space of a space object. Launching States as a whole are liable for the whole activity. It is up to them to negotiate agreements to share their obligations with the other launching States.

When a State intervenes only for the launching *stricto sensu*, it would be wise and fair that it should have only to pay for damage during the launching period. The States that procure the launch, on the other hand, should not have to pay for damage caused during the launch itself, as they cannot do anything during that period, but should be very much concerned for the lifetime of the object in outer space.

The Liability Convention does not govern these issues, but it opens the way for agreements to solve them. The Liability Convention deals only with the case of the victim and it does well. The other problems are to be solved by agreements between the launching States, without limiting the rights of the victims.

The Liability Convention also does not apply to liability between launching States.

Let us examine another possible case: A space object of Germany is launched from Kourou by an Ariane rocket. A few years afterwards, this object falls on France and causes damage to a French citizen. Can France sue Germany under the Liability Convention?

My answer is no!

Both States are equally liable for the same space object. If we consider that the liability is an objective liability, no fault is to be considered. The situation of France is not to be distinguished from the situation of Germany. Therefore, it is impossible for a launching State to sue another launching State of the same space object <u>under the Liability Convention</u>, at least when objective liability is concerned. The only possibility is to sue through general liability rules or according to an agreement existing between both States.

The Liability Convention does not govern the relationship between a State and the national entities it is liable for.

The Liability Convention sets a State-to-State liability; it does not consider the relationship between a State and a private company for which the State is responsible and/or liable. This should be considered by domestic law. The US Commercial Space Launch Act 1984-1988 and the Australian Space Activities Act 1998 are quite efficient on that matter. They do not jeopardise the international responsibility and liability of the State toward the victim, but they clarify the situation and, through the establishment of a maximum probable loss, they simplify and greatly support private activities.

Conclusion

After these few remarks, I am not going to make a real conclusion. I will only say that the current liability regime needs improvement, not by changing the Liability Convention – this is not necessary and it is very dangerous – but by completing it and solving the problems caused by its shortcomings. General or special agreements between launching States and domestic laws are ways to make this improvement.

The Registration Convention

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1. INTRODUCTION

In 1980, the Minister for Foreign Affairs of the Netherlands submitted three United Nations (U.N.) Space Treaties to Parliament in order to get approval for their ratification: the Rescue (of Astronauts) Agreement, the Liability Convention and the Registration Convention.

In the accompanying letter the Minister stated that, already in 1968, the Netherlands had signed the Rescue Agreement. Ratification, however, had been postponed for many years, since the Agreement benefited primarily the space powers, at that time the United States of America and the Soviet Union. A treaty was needed which would deal with the matter of liability for damage caused by space activities. This would redress the imbalance created by the Rescue Agreement to the benefit of the non-space powers, the potential victims of space activities.

The Liability Convention of 1972 took care of that; nevertheless, in the view of the Netherlands Government it lacked one important provision, viz. an obligation for the launching States to take such measures as to enable the identification of their space object in case of damage.

The Registration Convention of 1976 filled that gap sufficiently to create, in the view of the Netherlands, an acceptable "package" of interrelated rules adequately serving the interests of all parties concerned. Hence, the submission of the three treaties together. They were indeed ratified/acceded to by the Netherlands soon thereafter. There were more States at the time that took the same approach as the Netherlands.

This "identification" purpose of the Registration Convention is reflected both in one of the preambular paragraphs of the pertinent General Assembly Resolution and in the preamble of the Convention itself, respectively as follows:

"Desiring, in the light of the [Space Treaty, Rescue Agreement and Liability Convention], to make provision for registration by launching States of space objects launched into outer space *with a view, inter alia, to providing States with additional means and procedures to assist in the identification of space objects,…*" (emph. add.)

"Believing that a *mandatory* system of registering objects launched into outer space would, in particular, assist in their identification…" (emph. add.)

The word "mandatory" should be stressed.

Already in 1961 the General Assembly adopted a resolution (1721 B (XVI)) which (a) asked the Member States to provide the Outer Space Committee – through the Secretary-General – with information about their space activities, and (b) requested the Secretary-General to create a public registry for that purpose. That voluntary system, which does not require any specification of the information to be provided, is still in use today.

In the 1960's and 1970's, the Committee on Space Research (COSPAR) of the International Council of Scientific Unions, a non-government organization, also maintained a register in which launch data were recorded; in addition, COSPAR provided satellites with an international designation number and published these data for the benefit of primarily the international scientific community. Furthermore, the International Telecommunication Union (ITU) has for many years collected information from COSPAR, the National Aeronautics and Space Administration (NASA) of the U.S. and the specialized press in order to publish its own record of satellite launchings.

None of these public registers were of a mandatory nature and none of these required uniform, standardized and up-to-date data.

In other words, prior to the Registration Convention, a space accident victim on the Earth could not count on having a reliable, sophisticated and complete – publicly available – registration system which would assist in quickly and efficiently identifying the culprit. It was envisaged that the Registration Convention would remedy that insufficiency.

2. THE CONVENTION

The parties to the Convention have two principal obligations:

– As "launching State" with respect to a specific space object, a party should register that space object in its own national registry ; and

– As "State of registry" (which is a launching State which has so registered), it should provide the Secretary-General with specific information on the space object, for inclusion in the latter's Register.

a. Launching State and the duty to register

The term "launching State" in this connection means: (i) a State which launches or procures the launching of a space object, (ii) a State from whose territory or facility a space object is launched.

The fact that this definition is the same as the one used in the Liability Convention creates a comparable dilemma or choice in case two or more States are involved in the launch, since the definition makes them all "launching States". For example, the Netherlands Government buys a communications satellite and concludes a contract with a Ukrainian governmental launch company that performs the launch from the Brazilian Alcântara launch base. (We will not complicate the example by turning all parties into private entities!)

Under the Liability Convention, in case of damage, the three parties concerned may all be held liable as "launching States" (the Netherlands procured the launching, Ukraine launched and Brazil provided territory and facilities). It is up to the victim to choose any or all for that purpose.

Under the Registration Convention the two or more launching States "shall jointly determine which one of them shall register the object" in its national registry. The State so chosen thus becomes the "State of registry" which has to provide the U.N. Register with the required information. In the given example all three States qualify.

As a result of sharing the same definition of "launching State" a second element the two Conventions have in common is the question of the – possible – effect of a change in ownership of the satellite, which has been launched and registered, on the application of the respective Convention.

In discussions at the meetings of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) Legal Subcommittee, it has been observed that there is an element of unfairness in the strict rule that the launching State is held liable for damage caused by its satellite even years after that State has transferred ownership of – and thus jurisdiction and actual control over – the satellite to a third party. "Too bad!" one could answer, referring to the victim-oriented character of the Liability Convention and the fact that the letter of the Convention simply leaves no choice. Or one could ask for an amendment of the Convention.

"Choice" is what the States under the Registration Convention do not seem to have either ("only a launching State may register a space object in its national registry and thus become a State of registry with obligations vis-à-vis the U.N. Register"), but in practice the States concerned have been more flexible. Two examples provided in a recent article, co-authored by Dr. Schrogl from the German Aerospace Center (Deutsches Zentrum für Luft- und Raumfahrt or DLR) and Mr. Davies of the U.N. Office for Outer Space Affairs (OOSA), highlight that flexibility.

In 1998 the U.N. Secretariat was informed that four communications satellites owned by Hong Kong interests and registered by the United Kingdom of Great Britain and Northern Ireland (U.K.) (AsiaSat-1 and 2, APSTAR-I and IA) had with effect from 1 July 1997 been transferred to the national registry of Hong Kong Special Administrative Region (SAR) of the People's Republic of China. The original launching State, the U.K., having transferred Hong Kong back to China, thus also transferred the status of State of registry to Hong Kong, a status one can only earn as a launching State. In this case, China did qualify as an original launching State because all four satellites had been launched from Chinese territory. This arrangement thus remained within the framework of the Convention's article 2 paragraph 2, which allows two launching States to determine which one of them shall register the space object in its national registry. Nothing in the Convention prevents the two launching States from changing their original arrangement.

A second example is a more tricky case. Satellite BSB-I A was originally registered with the U.N. by the U.K. following its launch from the U.S. in 1989. In 1996 Sweden bought the satellite in orbit and, subsequently, conveyed to the U.N. Register information on the satellite as the new State of registry. As only launching States have the right to act as State of registry, strictly speaking Sweden, which was not a launching State, did something it was not allowed to do, considerably stretching the law. At the same time Sweden showed a sense of responsibility by making clear to the U.N. community that it had assumed jurisdiction and control over the satellite and accepted the consequences thereof. But that is a matter which falls under article 6 of the Outer Space Treaty.

b. Information duties of the State of registry

Let us have a look at the information duties of the State of registry vis-à-vis the U.N. Secretariat, under these two headings "when" and "what".

The Convention requires the State of registry to furnish information concerning its space object "as soon as practicable". In other words, it is left to the State of registry to determine how soon after the launch the information will be provided to the U.N. Secretariat. The practice of Member States shows a variety of reporting habits, as Mr. Lála (OOSA) will explain. This is understandable: a State with the experience of years of multiple space activities may, for practical reasons, have decided to report on a monthly or quarterly basis; whereas a proud newcomer in the space field may want to publish immediately all data pertaining to its first successful satellite launch.

The sequence of the Convention's information duties provides an additional opportunity for (intentional) delays. Article 4 requires the State concerned to furnish to the Secretary-General information concerning each space object "carried on its registry". So when will the entry of the space object in this national registry take place? Article 2 of the Convention states "when a space object is launched", which looks specific, but in fact it is not.

From the point of view of the (potential) victim State this is not very satisfactory, particularly if one takes into account that the launch itself is the most critical moment in the life of a satellite. Obviously, the purpose of the Convention would require globally distributed information about the space object before, during and after the launch, which, in the age of the satellite-supported World Wide Web should not present any technical difficulty.

For the same reason, the information should not only be up-to-date, but also complete. So what is the information which the State of registry has to provide to the U.N.? Article 4 lists the following elements: name of the launching State(s), designator or registration number of the space object, date and territory or location of the launch, basic orbital parameters and general function of the space object. In principle, in case of a "crash", that should be sufficient information to assist in the identification of the launching State with respect to the space object concerned. Of course, data on the propulsion system (nuclear or otherwise) and radio frequencies used could also be helpful in this connection.

Missing from the Registration Convention is the obligation found for other modes of transport, such as aircraft or ships, i.e., a registration mark on the body of the vehicle. Discussions at UNCOPUOS on this possible requirement took a long time. In the end, the Scientific and Technical Subcommittee supported the position of the United States of America that this requirement was neither technically feasible nor necessary (apart from being costly and impractical). Marking the space object is not a requirement under the Convention, but if a State decides to put a mark on the object, the U.N. Register should be informed accordingly.

In practice, a more important aspect affects the completeness and reliability of the registration system of the Convention, i.e., the fact that States feel free not to register satellites with highly sensitive national security tasks and functions. Although the Convention makes no distinction based on – civil or military – purposes (article 2, paragraph 1: "When a space object is launched…the launching State shall register…"), article 2, paragraph 3 provides that "[t]he contents of each registry and the conditions under which it is maintained shall be determined by the State of registry concerned".

This latter provision could possibly be (mis-)used to leave certain space objects out of the national registry, thereby "neutralizing" the obligation to report to the U.N. Register all data pertaining to space objects carried in the national registry.

The draftspersons knew that the provisions of the Convention would not always solve all identification problems for the parties concerned. Hence a special provision which allows parties, who have been unable to identify – the State behind – a space object which has caused damage or which is otherwise dangerous, to request the assistance of other States "possessing space monitoring and tracking facilities" in the identification of the object. At the time of drafting, these facilities were basically only available in the U.S. and the Soviet Union, with, potentially, the ironic result that in some cases the "culprit" would be asked to identify a space object as its own. There are now some more "catalogues" of space object data, including privately-held ones. As a result, space objects or parts thereof can and will usually be identified.

3. CLOSING REMARK

The Registration Convention was not meant to specifically prevent accidents. That does not mean that it should not or cannot be used for that purpose. The preambular paragraphs quoted earlier and the reference to the Liability Convention leave sufficient room for focusing on the need to provide data in sufficient detail and at a sufficient early stage to prevent collisions and interference between satellites. If "identification" of space objects for the purpose of the effective application of the Liability Convention is the central theme of the Registration Convention, it is only a short hop to accidents and incidents involving two or more launching States and their space objects and the need for an early warning system based on reliable, complete and up-to-date data (an idea which, one would suppose, the space insurance industry, in particular, should espouse for its own benefit). This issue, commonly referred to as Space Traffic Management, is basically one of how to create and maintain a system of hundred percent reliable space data to prevent collisions of and interference with satellites (and aircraft in flight).

This is another way of saying that the Registration Convention still has an important role to play, not only for the traditional protection of the non-space powers but also for all States engaged in space activities whose industries (e.g. telecommunications) are dependent on present and future satellites in orbit.

Reporting incomplete launch data to the U.N. Register one or more months after the fact is a bureaucratic way of saying "I care only about the archive function of the Convention". Any new party to the Registration Convention could start by promising a modern, dynamic, www-based approach towards its obligations as a State of registry, by reporting data before, during and after the launch, and by demanding the other parties, through UNCOPUOS, to follow suit.

That could also rekindle a discussion on the role of the Registration Convention, yesterday, today and tomorrow.

Joint United Nations/International Institute of Air and Space Law
Workshop on Capacity Building in Space Law

The United Nations Register of Objects Launched into Outer Space*

Petr Lála
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*This paper does not necessarily represent the views of the United Nations

The United Nations Convention on Registration of Objects Launched into Outer Space

- adopted by the UN General Assembly: 12 November 1974 (**resolution 3235 (XXIX)**),
- opened for signature on 14 January 1975,
- entered into force on 15 September 1976,
- supersedes **General Assembly resolution 1721 (XVI) B** of 20 December 1961.

The United Nations Register of Objects Launched into Outer Space

- As of 1 January 2002, there were 44 ratifications and 4 signatures:

  Antigua and Barbuda, Argentina, Australia, Austria, Belarus, Belgium, Bulgaria, Burundi (Signature only), Canada, Chile, China, Cuba, Cyprus, Czech Republic, Denmark, France, Germany, Hungary, India, Indonesia, Iran (S), Japan, Kazakhstan, Liechtenstein, Mexico, Mongolia, Netherlands, Nicaragua (S), Niger, Norway, Pakistan, Peru, Poland, Republic of Korea, Russian Federation, Saint Vincent and the Grenadines, Seychelles, Singapore (S), Slovakia, Spain, Sweden, Switzerland, Ukraine, United Arab Emirates, United Kingdom, United States of America, Uruguay, Yugoslavia.

- Two international organizations have declared their acceptance of rights and obligations:

  European Space Agency (ESA) and European Organization for the Exploitation of Meteorological Satellites (EUMETSAT)

- As of 1 November, OOSA has issued 419 documents containing registration data on 6,192 space objects.
- Voluntary registration information was provided by Brazil, Israel, Italy, Luxembourg and Malaysia

The United Nations Register of Objects Launched into Outer Space

The main objective of the Register is to provide data needed by other treaties:

- **OUTER SPACE TREATY**
  - affirms that States shall bear international responsibility for their national activities in outer space;
  - refers to the State on whose registry an object launched into outer space is carried.
- **RESCUE AGREEMENT**

  provides that launching authority shall, upon request, furnish identifying data prior to the return of an object it has launched.
- LIABILITY CONVENTION

  establishes international rules and procedures concerning the liability of launching States for damage caused by their space objects.

The United Nations Register of Objects Launched into Outer Space

Application of Article III of the Registration Convention:

- The Secretary General shall maintain a Register in which information furnished in accordance with article IV shall be recorded";
- ”There should be full and open access to the information in this Register".

The United Nations Register of Objects Launched into Outer Space

Application of Article III of the Registration Convention:

- **Register:**
  - The Register established at the Office for Outer Space Affairs (OOSA) on behalf of the Secretary General, first document ST/SG/SER.E/1 issued on 14 April 1977. It contains information on space objects launched by the United States of America as of 31 December 1976.
  - As of 1 November 2002, OOSA has issued 419 documents containing registration data on 6,192 space objects.
  - In addition, the Office continues to maintain, and transmit to the Committee on the Peaceful Uses of Outer Space, registration information furnished by member States on a voluntary basis in accordance with General Assembly resolution 1721 (XVI) B of 20 December 1961. Such information appears in document series A/AC.105/INF.1-407. Voluntary registration information was provided by Brazil, Israel, Italy, Luxembourg and Malaysia.
  - All registration information is maintained by the Office in printed and electronic form and is continually updated. Total number of space objects listed in the electronic form of the Registry (including some objects not officially registered) by 1 November 2002 is 12,279. About 5,600 are still orbiting around the Earth.

The United Nations Register of Objects Launched into Outer Space

Application of Article III of the Registration Convention:

State of registry	Number of registered space objects 1976 - 2001
Argentina	5
Australia	5
Brazil (voluntary reg.)	1
Canada	10
Chile	1
China	33
Czech Republic	5
ESA	38
Eumetsat	1
France	144
Germany	16
India	29
Israel (voluntary reg.)	2
Italy (voluntary reg.)	8
Japan	73
Korea, Republic of	7
Luxembourg (voluntary reg.)	8
Malaysia (voluntary reg.)	3
Mexico	2
Pakistan	1
Russian Federation	2150
Spain	5
Sweden	10
UK	22
USA	3128
Ukraine	2
United Arab Emirates	1

The United Nations Register of Objects Launched into Outer Space

Application of Article III of the Registration Convention (cont.):

Searchable Index to the Register:

(developed by the Office in response to a request during the 2000 session of COPUOS)

- It contains information received from member States and also complementary information collected from external sources on all functional objects launched into outer space since 1957. (Space debris and non-functional objects are not included.)
- Search could be performed using different parameters (name, international identification, State of registry, date of launch, orbital status, etc.)
- It provides links between space objects and their relevant documents of registration. This way, every user can download and print any registration document.
- It is fully operational and easily accessible through the Office's home page at URL:

http://registry.oosa.unvienna.org/oosa/index/index.stm

- The following information is also available:
  - Index of Online Notifications from States & Organizations (Launch Year 1976-present);
  - Index of Notifications by Year of Issue (Launch Year 1976-present);
  - Index of Notifications by Member States and Organizations on the Establishment of National Registers of Objects

The United Nations Register of Objects Launched into Outer Space

Application of Article III of the Registration Convention (cont.):

Searchable Index to the Register: Example

(developed by the Office in response to a request during the 2000 session of COPUOS)

Office for Outer Space Affairs
Online Index of Objects Launched into Outer Space

Search Form
Notifications by State
Notifications by Year of Issue

UN Office for Outer Space Affairs

Information in square brackets ([and]) and highlighted in **green** has been obtained from other sources and has not been communicated to the United Nations in conformity with the Registration Convention or resolution 1721 B (XVI).

Last Launch: [2002-050A 30 October 2002 (Soyuz TMA-1)]

Last Decay/Reentry: [2002-014C 12 November 2002 (Shenzhou 3 Orbital Module)]

Database Last Update: 14 November 2002

0002671

☑ Display Backgrounds

Online Index of Objects Launched into Outer Space: Search Results

Search Criteria: Name of Space Object: LIKE '%%', State/Organisation: ('RF/USSR'), Year: ('2002'), UN Registered: ('Yes')

International Designator	Name of Space Object	State/ Organization	Date of Launch	GSO Location	Nuclear Power Source	UN Registered	Document of Registration	Status	Date of Decay or Change	Document of Decay or Change	Function of Space Object	Remarks
[2001-051C]	COLIBRI 2000 (KOLIBRI 2000)	Russian Federation	20/03/2002	------	------	Yes	ST/SG/SER.E/410	[decayed]	[04/05/2002]	ST/SG/SER.E/416	Research on the radiation belts of the Earth's magnetosphere above the continents of Europe and Australasia, as part of a scientific education programme for young people in Australia and the Russian Federation	Stated Date of Launch is date of deployment from Progress M1-7
[2002-008A]	COSMOS 2387	Russian Federation	25/02/2002	------	------	Yes	ST/SG/SER.E/410	[decayed]	[27/06/2002]	ST/SG/SER.E/416	The space object is intended for assignments on behalf of the Ministry of Defence of the Russian Federation	------
[2002-013A]	PROGRESS M1-8	Russian Federation	21/03/2002	------	------	Yes	ST/SG/SER.E/410	[deorbited]	[25/06/2002]	ST/SG/SER.E/416	Delivery of fuel, food and other consumables to the International Space Station	------
[2002-017A]	COSMOS 2388	Russian Federation	02/04/2002	------	------	Yes	ST/SG/SER.E/416	in orbit	------	------	This space object is intended for assignments on behalf of the Ministry of Defence of the Russian Federation	Date of Launch is 01/04/2002 using GMT.
[2002-020A]	SOYUZ TM-34	Russian Federation	25/04/2002	------	------	Yes	ST/SG/SER.E/416	[recovered]	[10/11/2002]	------	Delivery to the International Space Station of a crew consisting of the Russian pilot astronaut Yuri Gidzenko and European Space Agency astronauts Roberto Vittori (Italy) and Mark Shuttleworth (South Africa)	------

Records 1 to 5 from 8 selected.

Important Note: Information in square brackets ([and]) and highlighted in **green** has been obtained from other sources and has not been communicated to the United Nations in conformity with the Registration Convention or resolution 1721 B (XVI).

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The United Nations Register of Objects Launched into Outer Space

Application of Article I of the Registration Convention:

Definition of space object:

"The term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof"

Dilemma:

Should States register all objects launched into outer space, including non-functional objects and so called space debris which may be created long time after the launch (by explosions, collisions, etc.).
Does every State of registry have a capacity to monitor such objects in space?

Present situation:

USA: Announcing all objects, including newly discovered space debris. Providing information also about their decay in the atmosphere;

Russian Federation: Only launch and decay of functional objects is announced;

China, France and India: In addition to functional objects, information is sometimes provided on last stages of launchers, but never on space debris.

The United Nations Register of Objects Launched into Outer Space

Application of Article II of the Registration Convention:

Definition of the State of Registry:

The term "State of registry" means a launching State on whose registry a space object is carried...
Where there are two or more launching States in respect of any such space object, they shall jointly determine which one of them shall register the object.

Problem No. 1:

There are some violations of the provision that the space object should be registered only by one State:

USA & India: Insat 1A and its launcher rocket (1982-031A and B, 1983-089C), Insat 1D (1990-051A)
USA & UK: UOSAT 1 (1981-100B), ICO 2 (2001-026A)
USA & France: TOPEX/POSEIDON (1992-052A)
USA & ESA: ESA-GEOS 1 (1977-029A), EXOSAT (1983-051A), ULYSSES (1990-090B)
USA & Argentina: SAC-B (1996-061A), SAC-C (2000-075B)
USA & Sweden: Munin (2000-075C)
USA & Russian Federation: Reflektor (2001-056E)
USA & Germany: Grace 1 and 2 (2002-012A and B)
China & Brazil: CBERS 1 and SACI 1 (1999-057A and B)

Not registered:

ZARYA (1st ISS module - 1998-067A): launched by Russian Federation for USA (marked as "American registration" in the document ST/SG/SER.E/354).

The United Nations Register of Objects Launched into Outer Space

Application of Article II of the Registration Convention:
Problem No. 2:

There is no provision for the "change of ownership" of the space object.
In particular, communication satellites are leased or even sold, so that the original State of registry has no control over the object.

Examples of announced changes:

- UK to China: Asiasat 1 and 2, Apstar 1 and 1A in documents ST/SG/SER.E 333 and 334,
- from UK to Sweden: Sirius 1, announced in document ST/SG/SER.E. 352;

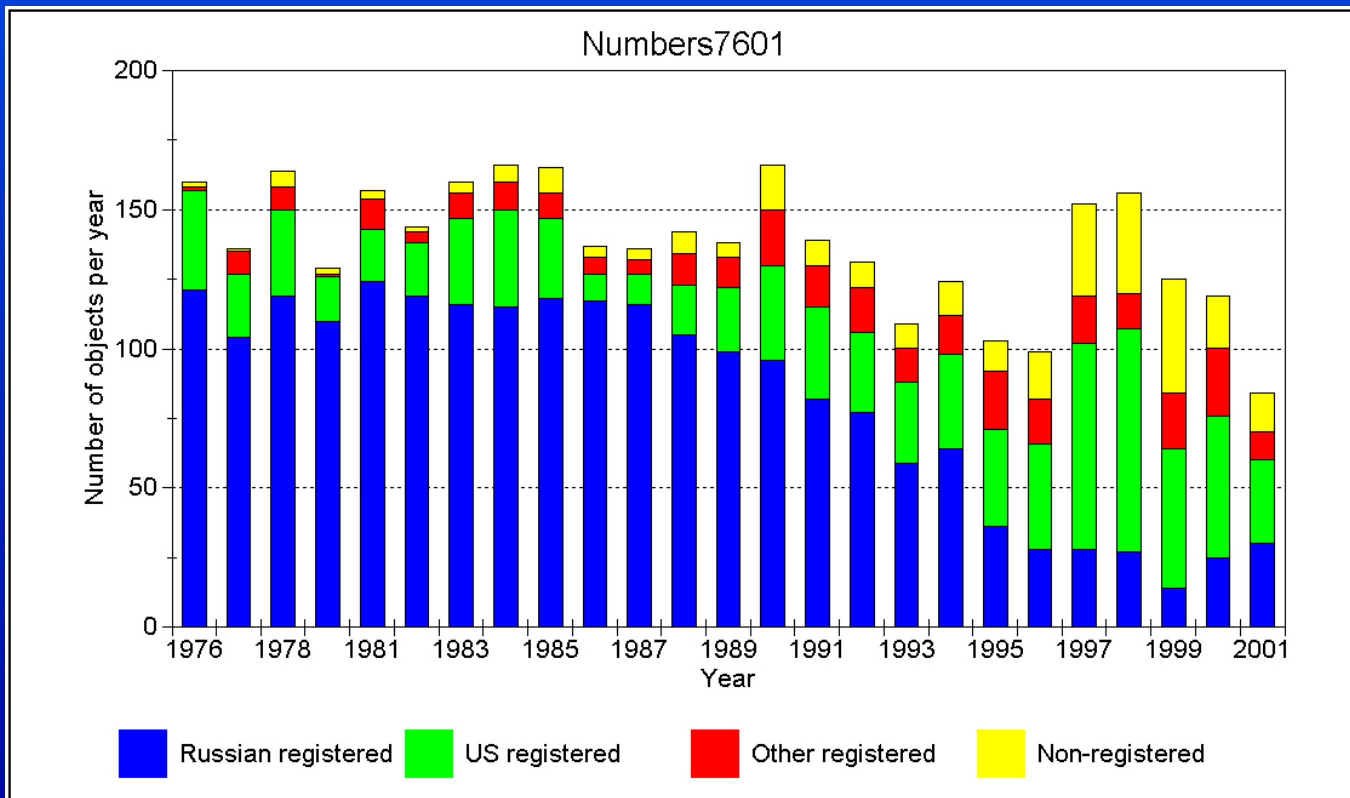
Unannounced:

- from Canada (Anik C1 and C2 to Argentina and Brazil),
- from Russian Federation (Gorizont satellites to Rimsat).

The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention:

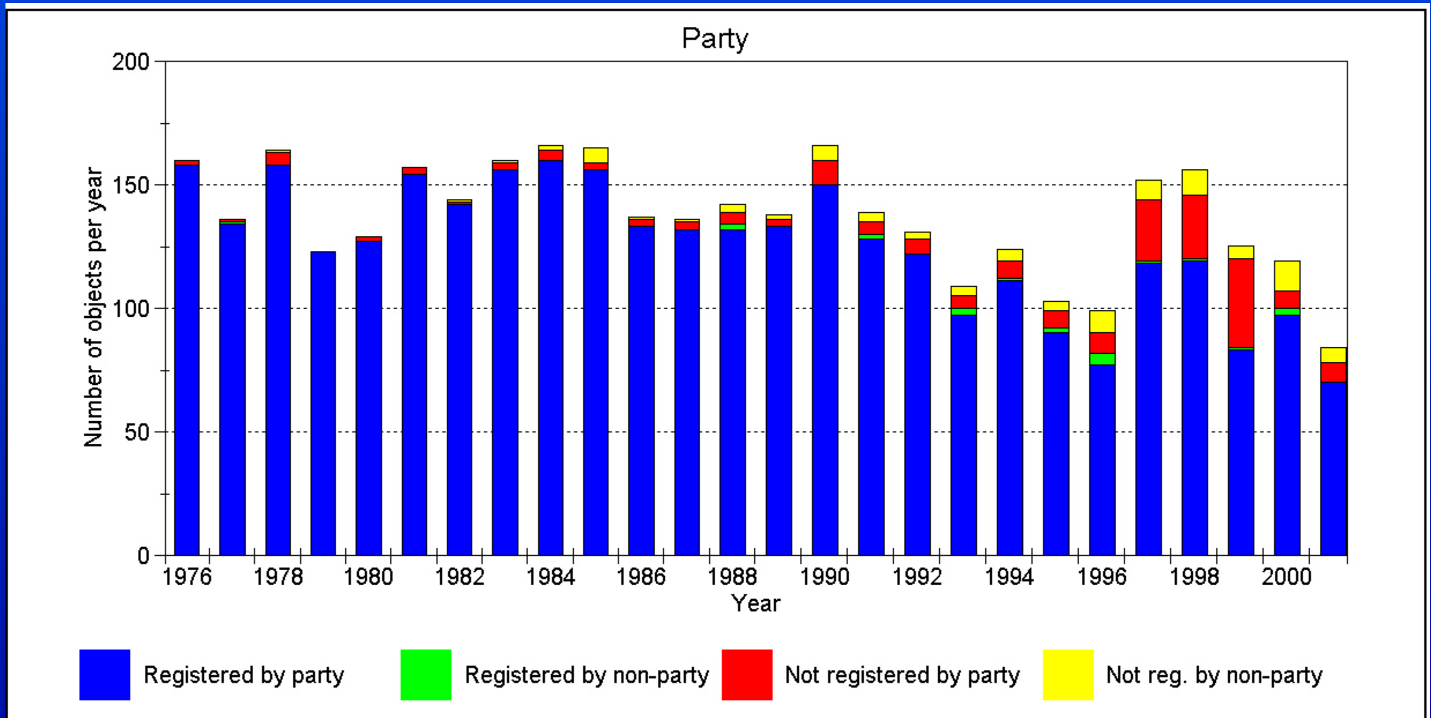
Problem No. 1: Information should be "**furnished as soon as practicable".** Therefore, there is no time limit for submission



The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention (cont.):

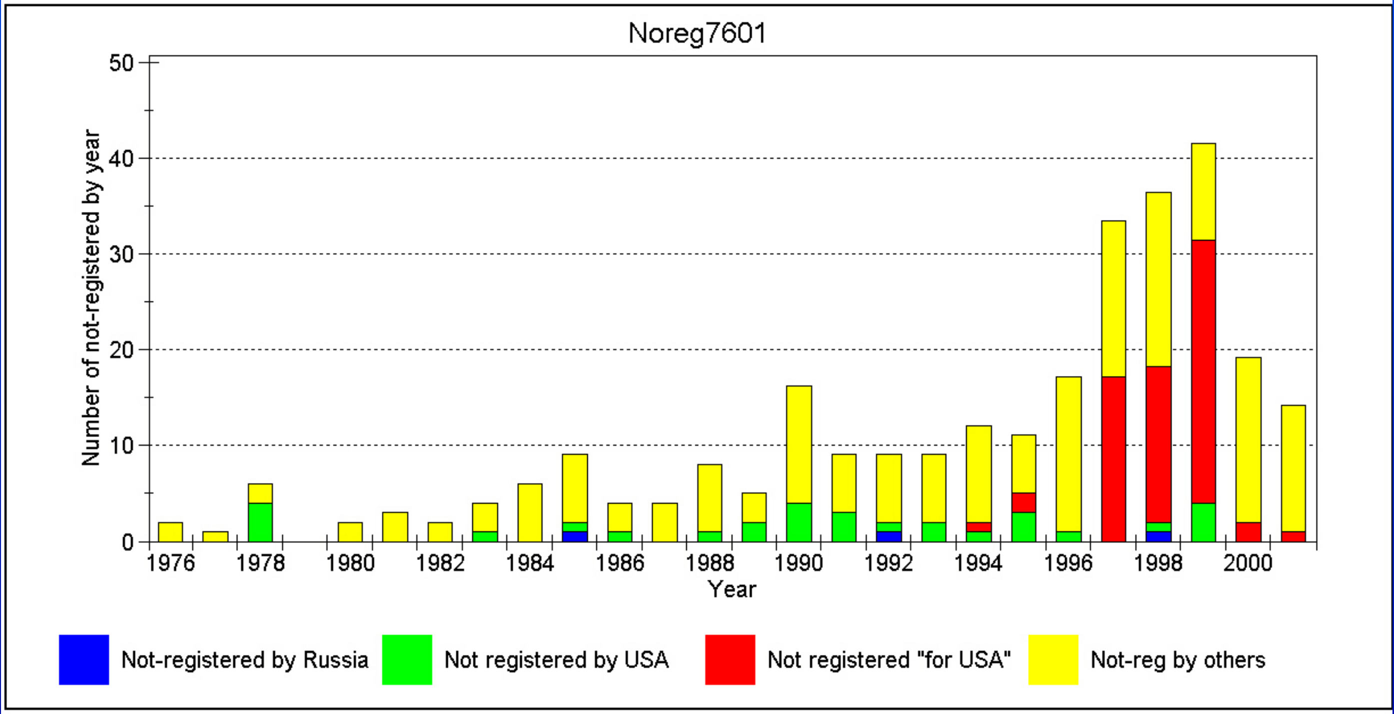
Problem No. 1: Information should be "**furnished as soon as practicable".** Therefore, there is no time limit for submission



The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention (cont.):

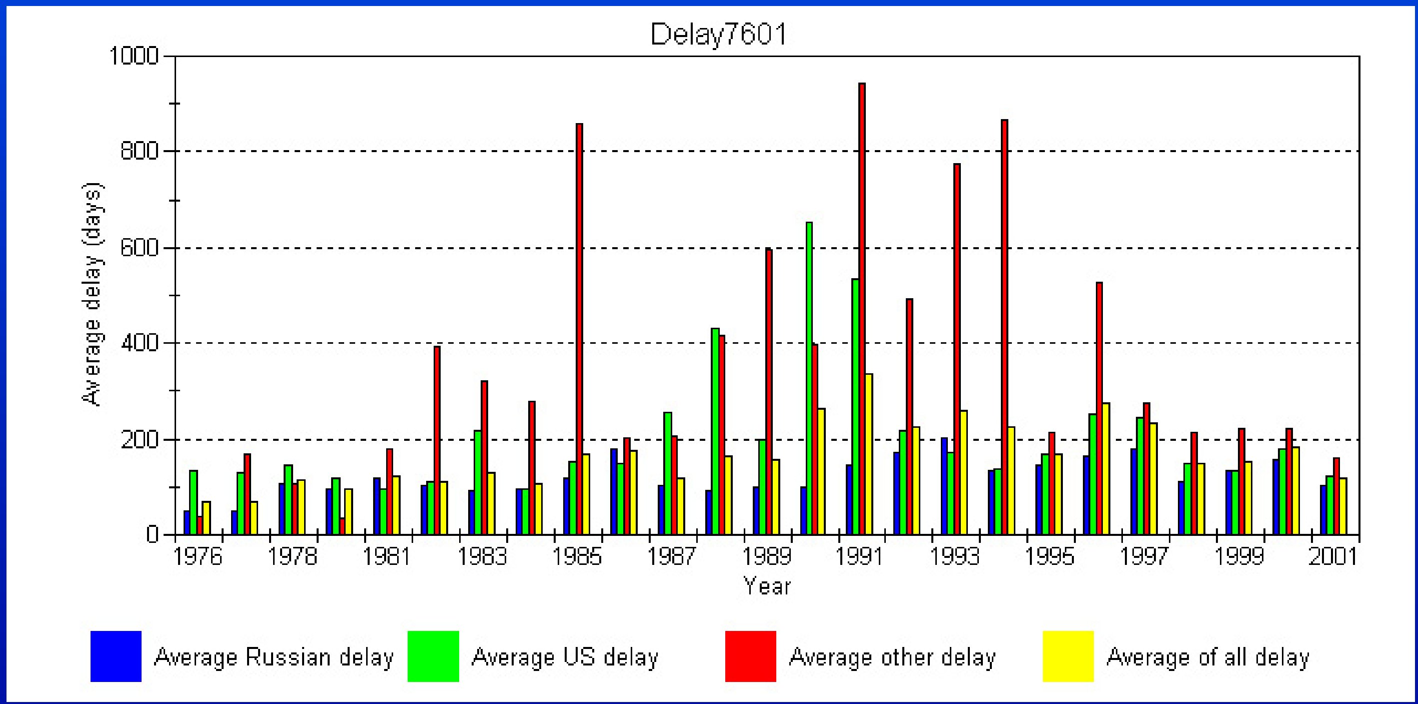
Problem No. 1: Information should be "**furnished as soon as practicable".** Therefore, there is no time limit for submission



The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention (cont.):

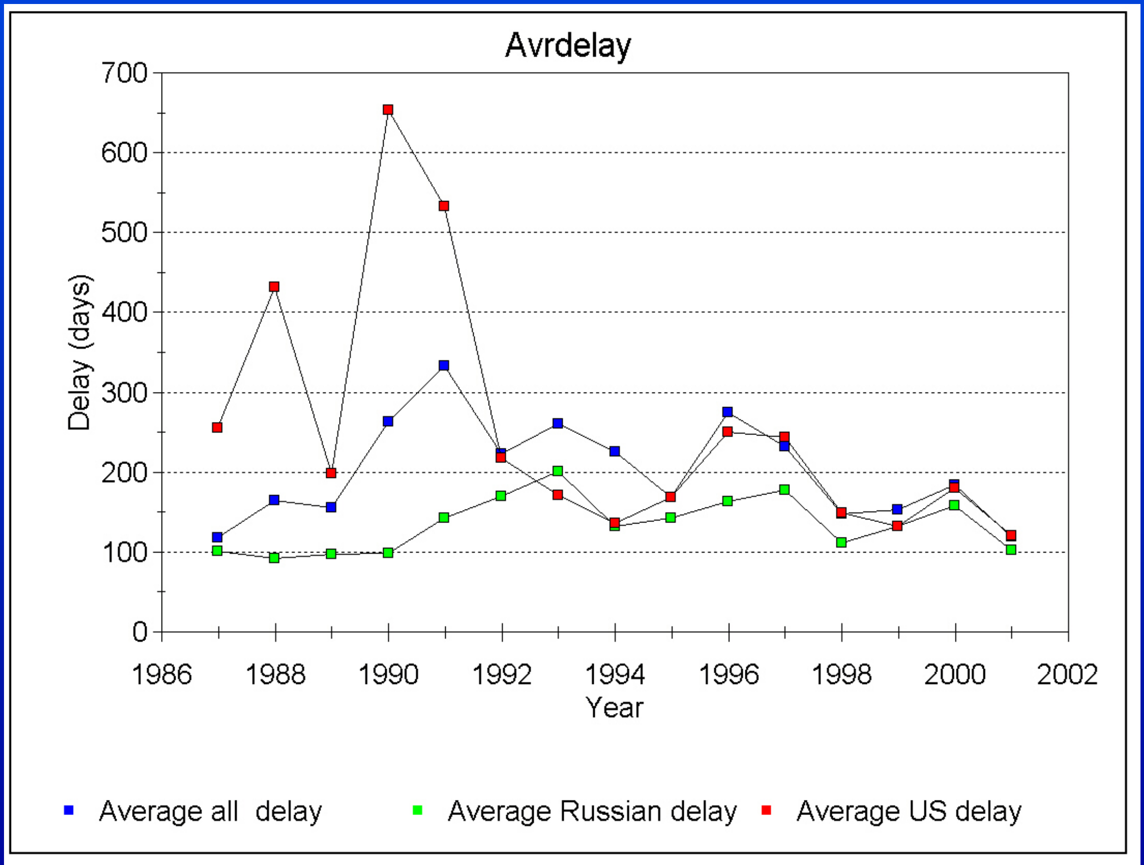
Problem No. 1: Information should be "**furnished as soon as practicable**". Therefore, there is no time limit for submission



The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention (cont.):

Problem No. 1: Information should be "**furnished as soon as practicable". **Therefore, there is no time limit for submission



The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention (cont.):

Problem No. 2:

- The description of requested information is too vague, resulting in different interpretations - e.g.: "An appropriate **designator of the space object or its registration number**" - some States (USA) provide only the international registration number, others (Russian Federation) provide only the name of the object;
- Date and **territory or location of the launch**: Some launches outside the territory of the State of registry are not marked as such;
- **Basic orbital parameters**: There is no specification of the type of orbital information - Some States provide initial orbit, others intermediate (parking) orbit and still others the final operational orbit.
- Data on apogee, perigee - usually provided are heights above the Earth surface, but sometimes distance from the centre of the Earth (difference of 6378 km!);
- Provided data do not completely describe the orbit anyway (position of the orbital plane and satellite itself are not provided);
- General function of the space object: description is quite often only formal without real information content:
  - (Spacecraft engaged in investigation of spaceflight techniques and technology,
  - Investigations of the upper atmosphere and outer space.)

The United Nations Register of Objects Launched into Outer Space

Application of Article IV of the Registration Convention (cont.):

Problem No. 3:

- The "Each State... may, from time to time, provide ... additional information concerning the space object..."
- This would be a very useful provision, but it is very rarely used.
- **Good examples:** emergency information concerning the possible decay of Cosmos 1402 and 1900 satellites, as well as Mars 96 probe with NPS on board. Information on the process of deorbiting the Mir station and Compton Gamma Ray Observatory has also been distributed.
- Important **information about the end of useful (functional) life** of space object is provided practically only by Sweden and India. Such information would be invaluable for the study of space debris environment.

The United Nations Register of Objects Launched into Outer Space

Application of Article V of the Registration Convention:

"Whenever a object launched into Earth orbit or beyond is marked with the designator or registration number...should notify"

This provision has never been used, but it would be useful in identification of space debris after their discovery on the ground.

Application of Article VI of the Registration Convention:

Assistance in the identification of the object - has never been used in this context -

- not relevant to the Register issue

The United Nations Register of Objects Launched into Outer Space

Application of Article VII of the Registration Convention:

"Reference to States shall be deemed to apply to any international intergovernmental organization which conducts space activities if the organization declares its acceptance of the rights and obligations ... and if a majority of the States members of the organization are States parties to this Convention and to the Space Treaty"

- So far, only ESA and Eumetsat have declared their acceptance, some Eutelsat satellites were registered by ESA;
- completely not covered are non-governmental operators like New Skies, Globalstar, Intelsat, Intersputnik, Iridium, etc.

The United Nations Register of Objects Launched into Outer Space

CONCLUSIONS

In order the Register could serve the intended objectives:

- all States involved in launchings of space objects should ratify the Registration Convention;
- submission of data should be obligatory and timely (e.g. within 3 months after the launch);
- in case of launch involving several States, only one should be the State of registry;
- in case of launch from foreign territory or for non-governmental organization, this should be indicated;
- the launching time should preferably be given in Universal Time, because the use of local time could result in +/- 1 day difference in the date;
- basic orbital parameters should preferably describe the final operational orbit;
- consistent policy should be adopted regarding registration of non-functional objects.

The United Nations Register of Objects Launched into Outer Space

CONCLUSIONS (cont.)

In order to increase the usefulness of the Register:

- all description of the general function of the space object should contain more concrete information, not only the standard phrase;
- intended or actual position in geostationary orbit should be included in the data;
- the presence of nuclear power source on board of space object should be indicated (in line with Principles relevant to the use of nuclear power sources in outer space);
- the end of active (functional) life of particular space object should be announced;
- the operator of space object should be indicated;
- the change of the operator should be announced.

Procedures for Return of Space Objects Under the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space

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HISTORY OF 1968 AGREEMENT ON RESCUE OF ASTRONAUTS AND RETURN OF SPACE OBJECTS

- IDEA FIRST RAISED IN 1959 REPORT OF THE AD HOC COMMITTEE ON THE PEACEFUL USES OF OUTER SPACE.

- PARA 74 OF 1959 REPORT: "WHERE SPACE VEHICLES RE-ENTER THE EARTH'S ATMOSPHERE EITHER THROUGH DESIGN OR MISADVENTURE AND ANY EQUIPMENT OR INSTRUMENTATION IS RECOVERED BY COUNTRIES OTHER THAN THE LAUNCHING COUNTRY, ARRANGEMENTS ARE NEEDED FOR RESTORING SUCH INSTRUMENTATION AND EQUIPMENT TO THE LAUNCHING COUNTRY."

- PARA 21 OF 1959 REPORT: "PROBLEMS OF RE-ENTRY AND LANDING OF SPACE VEHICLES WILL EXIST BOTH WITH RESPECT TO UNMANNED SPACE VEHICLES AND LATER WITH RESPECT TO MANNED VEHICLES OF EXPLORATION. RECOGNIZING THAT LANDING MAY OCCUR THROUGH ACCIDENT, MISTAKE OR DISTRESS, MEMBERS OF THE COMMITTEE CALLED ATTENTION TO THE DESIRABILITY OF THE CONCLUSION OF MULTILATERAL AGREEMENTS CONCERNING RE-ENTRY AND LANDING. AMONG THE SUBJECTS THAT MIGHT BE COVERED BY SUCH AGREEMENTS WOULD BE THE RETURN TO THE LAUCHING STATE OF THE VEHICLE ITSELF AND – IN THE CASE OF A MANNED VEHICLE – PROVISION FOR THE SPEEDY RETURN OF PERSONNEL."

- EXCHANGE OF LETTERS ON FUNDEMENTAL ELEMENTS OF DRAFT RESCUE AGREEMENT BETWEEN USA AND USSR SET STAGE FOR BEGINNING OF NEGOTIATIONS IN 1962.

- AGREEMENT ELABORATED ON PROVISIONS CONTAINED PRIMARILY IN ARTICLES V AND VIII OF 1967 OUTER SPACE TREATY AND PARAS 7 AND 9 OF 1963 UN GENERAL ASSEMBLY (UNGA) DECLARATION OF LEGAL PRICIPLES GOVERNING THE ACTIVITIES OF STATES ON THE EXPLORATION AND USE OF OUTER SPACE.

- TEXT ADOPTED BY CONSENSUS BY UNGA ON DECEMBER 19, 1967, AND OPENED FOR SIGNATURE APRIL 22, 1968. ENTERED INTO FORCE DECEMBER 3, 1968.

- 88 STATES PARTIES AND 25 STATES SIGNED.

- RUSSIAN FEDERATION, UNITED KINGDOM AND UNITED STATES SERVE AS DEPOSITORY GOVERNMENTS.

OPERATIVE PROVISIONS DEALING WITH RETURN OF OBJECTS

- FOR PURPOSES OF AGREEMENT, "LAUNCHING AUTHORITY" SHALL REFER TO THE STATE RESPONSIBLE FOR LAUNCHING OR WHERE AN INTERNATIONAL INTERGOVERNMENTAL ORGANIZATION IS RESPONSIBLE FOR LAUNCHING, THAT ORGANIZATION, PROVIDED THAT THAT ORGANIZATION DECLARES ITS ACCEPTANCE OF THE RIGHTS AND OBLIGATIONS OF THE AGREEMENT AND PROVIDED THAT A MAJORITY OF THE STATE MEMBERS OF THE ORGANIZATION ARE CONTRACTING PARTIES TO THE AGREEMENT AND THE 1967 OUTER SPACE TREATY.

ARTICLE V PROVIDES FOR THE FOLLOWING:

- EACH CONTRACTING PARTY WHICH RECEIVES INFORMATION OR DISCOVERS THAT A SPACE OBJECT OR ITS COMPONENT PARTS HAS RETURNED TO EARTH IN TERRITORY UNDER ITS JURISDICTION OR ON THE HIGH SEAS OR IN ANY OTHER PLACE NOT UNDER THE JURISDICTION OF ANY STATE, SHALL NOTIFY THE LAUNCHING AUTHORITY AND THE SECRETARY-GENERAL OF THE UNITED NATIONS.

- EACH CONTRACTING PARTY HAVING JURISDICTION OVER THE TERRITORY ON WHICH A SPACE OBJECT OR ITS COMPONENT PARTS HAS BEEN DISCOVERED SHALL, UPON THE REQUEST OF THE LAUNCHING AUTHORITY AND WITH ASSISTANCE FROM THAT AUTHORITY IF REQUESTED, TAKE SUCH STEPS AS IT FINDS PRACTICABLE TO RECOVER THE OBJECT OR COMPONENT PARTS.

- UPON REQUEST OF THE LAUNCHING AUTHORITY, OBJECTS LAUNCHED INTO OUTER SPACE OR THEIR COMPONENT PARTS FOUND BEYOND THE TERRITORIAL LIMITS OF THE LAUNCHING AUTHORITY SHALL BE RETURNED TO OR HELD AT THE DISPOSAL OF REPRESENTATIVES OF THE LAUNCHING AUTHORITY, WHICH SHALL, UPON REQUEST, FURNISH IDENTIFYING DATA PRIOR TO THEIR RETURN.

- NOTWITHSTANDING PARAGRAPHS 2 AND 3 OF THIS ARTICLE, A CONTRACTING PARTY WHICH HAS REASON TO BELIEVE THAT A SPACE OBJECT OR ITS COMPONENT PARTS DISCOVERED IN TERRITORY UNDER ITS JURISDICTION, OR RECOVERED BY IT ELSEWHERE, IS OF A HAZARDOUS OR DELETERIOUS NATURE MAY SO NOTIFY THE LAUNCHING AUTHORITY, WHICH SHALL IMMEDIATELY TAKE EFFECTIVE STEPS, UNDER THE DIRECTION AND CONTROL OF THE SAID CONTRACTING PARTY, TO ELIMINATE POSSIBLE DANGER OF HARM.

- EXPENSES INCURRED IN FULFILLING OBLIGATIONS TO RECOVER AND RETURN A SPACE OBJECT OR ITS COMPONENT PARTS UNDER PARAGRAPH 2 AND 3 OF THIS ARTICLE SHALL BE BORNE BY THE LAUNCHING AUTHORITY.

RECENT INSTANCES OF RETURN OF SPACE OBJECTS

NOVEMBER 1999 JAPAN NOTIFIES UN SECRETARY-GENERAL AND US GOVERNMENT OF PEGASUS 1ST STAGE ON YORON ISLAND. FROM LAUNCH IN APRIL 1993.

MARCH 2000 US GOVERNMENT NOTIFIES FRANCE AND UN SECRETARY-GENERAL OF ARIANE NOSE CONE ON BEACH AT CORPUS CHRISTI, TEXAS. FROM LAUNCH IN 1998.

JULY 2000 SOUTH AFRICA NOTIFIES US GOVERNMENT AND UN SECRETARY-GENERAL OF 3 COMPONENTS OF DELTA II LAUNCHED IN 1996.

JANUARY 2001 SAUDI ARABIA NOTIFIES US GOVERNMENT OF RE-ENTRY OF DELTA II COMPONENT FROM 1993 LAUNCH. SAUDI ARABIA NOT PARTY TO RESCUE AGREEMENT BUT COMPONENT RETURNED PURSUANT TO ARTICLE VIII OF 1967 OUTER SPACE TREATY.

(for copies of these notes verbales, see pages 62 to 66)

Note verbale dated 20 January 2000 from the Permanent Mission of Japan (Vienna) addressed to the Secretary-General

[A/AC.105/735]

In accordance with article 5, paragraph 1 of the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of objects Launched into Outer Space, the Permanent Representative of Japan hereby wishes to notify the Secretary-General that component parts of a space object have been discovered on Japanese territory. The object was found on the beach on Yoron Island in the Kagoshima Prefecture by inhabitants of the island on 8 November 1999. It is a cylinder-shaped object, which is 6m in length and 1.25m in diameter. It is believed to be a component part of a United States launch vehicle. An investigation concluded that the object poses no risk of hazards to people and property, and it is temporarily being kept at the village office on the island. At present, and in cooperation with the Government of the United States, efforts to identify the object are underway.

In accordance with article 5(1) of the 1968 Agreement cited above, the Government of Japan is also notifying the Government of the United States.

The Permanent Mission of Japan further has the honour to request that this communication be circulated to Member States as an official document of the United Nations Committee on the Peaceful Uses of Outer Space.

Note verbale dated 13 March 2000 from the Permanent Mission of the United States of America to the United Nations (Vienna) addressed to the Secretary-General

[A/AC.105/737]

1. The Permanent Mission of the United States of America to the United Nations (Vienna) presents its compliments to the Office for Outer Space Affairs of the Secretariat and has the honour, on behalf of the Government of the United States of America, to notify the Secretary-General, in accordance with article 5, paragraph 1, of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Space Objects Launched into Outer Space (the "Agreement"),[1] that component parts of a space object have been discovered on territory of the United States of America. The object found had washed ashore near Corpus Christi, Texas, and appears to be part of the nose cone of a French Ariane rocket. It bears the following identifying lettering on a circular plate at the interior apex of the cone: "AEROSPATIALE, IE/AX, FLUXMETRE NO. SER.966-332, REF. DE DEF. A5-IK871-A-000 BLOCK CONTROLE: 25-.11.96". An investigation concluded that the object poses no hazard to people and property. It is being held temporarily by local authorities in Corpus Christi.

2. In accordance with article 5 of the Agreement, the Government of the United States of America has also notified the Government of France and invited it to identify the object.

3. The Permanent Mission of the United States of America further has the honour to request that this communication be circulated to Member States as an official document of the Committee on the Peaceful Uses of Outer Space.

Notes
[1]General Assembly resolution 2345 (XXII), annex

Note verbale dated 3 July 2000 from the Permanent Mission of South Africa to the United Nations (Vienna) addressed to the Secretary-General

[A/AC.105/740]

1. The Permanent Mission of South Africa to the United Nations (Vienna) presents its compliments to the Secretary-General of the United Nations and, in accordance with article 5, paragraph 1, of the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Space Objects Launched into Outer Space (General Assembly resolution 2345 (XXII), annex), wishes to notify the Secretary-General that three space objects have been discovered on South African territory. The objects were found in Durbanville, Worcester and Robertson, respectively, in the Western Cape Province of South Africa, on 27 April 2000.

2. The first object is a cylindrical steel vessel 2.7 metres long and 1.5 metres in diameter weighing 260 kilograms. The second object is a spherical metal object 60 centimetres in diameter and weighs approximately 33 kilograms. The third is a tapered, cylindrical and pipe-like object made from non-metallic, probably composite materials. It is approximately 60 centimetres long, 30 centimetres in diameter at "base" and 20 centimetres at "apex" and weighs approximately 30 kilograms. Preliminary investigations, in conjunction with Nicholas L. Johnston, Chief Scientist and Program Manager of the Orbital Debris Program Office at the Johnson Space Center of the National Aeronautics and Space Administration of the United States of America, revealed that the objects were believed to be component parts of a DELTA II second stage rocket used to launch a United States Global Positioning System (GPS) satellite on 28 March 1996. An investigation concluded that the objects posed no risk of hazards to people and property, and were being kept by the South African Astronomical Observatory in Cape Town.

3. In accordance with article 5, paragraph 1, of the 1968 Agreement, the Government of South Africa is also notifying the Government of the United States of America.

4. The Permanent Mission of South Africa further has the honour to request that the present communication be circulated to Member States as an official document of the Committee on the Peaceful Uses of Outer Space.

Note verbale dated 8 March 2001 from the Permanent Mission of Saudi Arabia to the United Nations (Vienna) addressed to the Secretary-General

[A/AC.105/762]

The Permanent Mission of Saudi Arabia to the United Nations (Vienna) has the honour to inform the Secretary-General, in compliance with article 5 of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the "Rescue Agreement", General Assembly resolution 2345 (XXII)), that a piece of space debris was discovered on 12 January 2001 on the territory of Saudi Arabia, at a location about 240 kilometres (km) west of Riyadh, the Saudi Arabian capital, about 1 km from the highway linking the capital with the city of Taef.

The Permanent Mission wishes to report the following:

(a) The object is a metallic cylinder, 140 centimetres (cm) long, 120 cm in diameter and weighing about 70 kilograms. Technical examination carried out by the Space Research Institute at King Abdulaziz City for Science and Technology using space debris monitoring programmes suggested that the object was the titanium cover of a solid-fuel motor used on board a GPS2 satellite, launched in 1993, which had been expected to fall in northern Brazil. Thiokol, the American manufacturer of this type of motor, was contacted and provided with the serial number on the object. Thiokol confirmed that the debris was in fact the cover of a Star 48-type motor used on board a GPS2 satellite launched in 1993;

(b) The Government of Saudi Arabia will notify the Government of the United States of America in this regard, in compliance with article 5, paragraph 1, of the Rescue Agreement.

The Permanent Mission requests that the present note verbale be circulated as an official document of the Committee on the Peaceful Uses of Outer Space

The International Telecommunication Union and Coordination of Space Telecommunications

ROGER SMITH
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ITU

Summary of Presentation

- The ITU
- Relationship with UN Legal Framework
- The ITU Legal Regime for Space
- Principles of management of Frequencies and Orbits
- Brief overview of the processes

Some Problem Issues

- Over-filing
- Processing backlogs
- Equity of access
- Service protection
- Long-term validity

International Legal Regime for the Management of the Radio frequency Spectrum and Satellite Orbit Resources

- A Union based on Member States (189)
- Cooperation and participation of Sector Members (650)
- Treaty based legal instruments
  - Constitution and Convention
  - Rules of Procedure (Conferences and Meetings)
  - Administrative Regulations (The Radio Regulations)

Established and maintained by Treaty Conferences

- Plenipotentiary Conferences
- World Radiocommunication Conferences

Relationship with UN Legal Framework

- Compatibility with UN Charter
- Recognition of UN Declarations and Treaties
- ITU Space services management based on Outer Space Treaty of 1967
- Space usage available to all
- Member States retain jurisdiction, control and responsibility for space objects (launched by them)

The ITU Legal Regime for Space

- **CS 11**
  - To effect **allocation** of frequency bands
  - The **allotment** of radio frequencies
  - The **registration** of radio frequency assignments and associated orbits (GEO and NON-GEO)
- **CS 12**
  - To **coordinate** efforts to eliminate harmful interference and improve spectrum and orbit use

The ITU Legal Regime for Space

- **CS 15**
  - To **harmonize the development** of telecommunications facilities
- **CS 18**
  - To **make regulations** and collect and publish information

Principles of Management of frequencies and Orbits

- **Efficient use and equitable access**

Article 44 of Constitution: "radio frequencies and any associated orbits, including the geostationary orbit, are limited natural resources and that they must be used rationally, efficiently and economically, in conformity with the provisions of the Radio Regulations, so that countries or groups of countries may have equitable access to those orbits and frequencies, taking into account the special needs of the developing countries and the geographical situation of particular countries".

Article 44 of Constitution:

- **CS 195** “Members shall endeavour to limit the number of frequencies and the spectrum used to the minimum essential to provide in a satisfactory manner the necessary services. To that end they shall endeavour to apply the latest technical advances as soon as possible”.

Principles in the Radio Regulations

- *A priori* planning – to ensure **equitable access**
- Coordination procedures – to ensure **efficiency**
- Efficient and rational use through “first come, first served” procedure

Overview of Processes

1. **Equitable access through frequency/orbital position plans (BSS and FSS)**

- Each country has a pre-determined orbit position
- Free use plus some free spectrum
- Mainly aimed at protection for developing countries

Overview of Processes

2. **Access to "non-planned" resources**

- Advance Publication
- Coordination request
- Notification and entry to the Master International Frequency Register (MIFR)
- Strict time limits for completion
- Strict compliance with a Table of Frequency Allocations and other technical provisions
- Procedures for obtaining coordination agreements
- Recording in the MIFR gives operational and technical protection

Some Problem Issues

- **Over filing**
  - Average of 400-500 per annum (until recently)
  - Average of 60-70 satellites per annum launched
  - Filings are free (until 1.1.2002 – cost recovery)
  - First come – first served
  - Need to guarantee a coordinated slot

Some Problem Issues (Contd)

- **Processing backlogs**
  - Normal prescribed processing time – **4** months
  - Current average – **28** months
  - Backlog of **1000** notices
  - Average receipt **40** per-month (now falling)
  - Average treatment **50** per-month
  - Resource problems
  - Complex procedures

Equity of Access

- Concerns by developing countries
- Resolution 80 (Rev. WRC-2000)
- Limits on long-term validity (retention of orbit positions)
- Limited access to scarce resources caused by over filing

Equity of Access

- Service Protection
  - Radio Astronomy and Science Services
  - Continuity of Services (Broadcasting and Telecommunications)

United Nations / International Institute of Air and Space Law
WORKSHOP ON CAPACITY BUILDING IN SPACE LAW
18-21 November 2002

The draft Protocol on Matters Specific to Space Assets & The (Unidroit) Convention on International Interests in Mobile Equipment

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What ?

- uniform international rules on security rights in high-value mobile equipment typically moving regularly across national frontiers or permanently outside national territory (aviation, rolling stock, space, …)
  - protection of rights of the creditor/financier

Why?

general:

- new methods of financing
  - "asset financing"
- applicable law ("where property is located")
  - predictability and thus cost reduction

Why ?

space:

- very high costs space activities
- increase private and commercial activities
- privatisation space activities
- limited life-span satellites

Who ?

- manufacturers of satellites and/or launchers
- satellite operators
- investors (banks/financiers/manufacturers)
- insurance companies
- int. organisations
- national space agencies
- users, eg. developing countries

Where ?

UNIDROIT: International Institute for the Unification of Private Law (1926, Roma)

- 1964 Convention on int. sale of goods
- 1995 Convention on Stolen or Illegally Exported Cultural Objects
- preparatory work instruments other int. organisations (eg UNESCO, CoE, UN)

How ?

- framework convention
- Protocol(s)
- electronic Registry of int. financial interests for each Protocol
- Supervisory Authority for each Registry

When ?

- 1988 first proposal
- 1992 start of work
- 1997 draft Convention
- working groups on Aviation, Rail, Space
- 2001 adoption Convention & Aviation Protocol (Capetown, South Africa)

Space Protocol

- assets out of reach
  - "associated rights"
- relation with international space law
  - int. space instrument agreed outside UN
  - primacy ?
  - ITU
- role of the United Nations
  - Supervisory Authority
  - Legal Sub-Committee UN-COPUOS

"space assets" - Art.I (2)(f) Protocol

– any separately identifiable asset or component of an asset, in space, to be in space, has been in space, is assembled or manufactured in space
– any ELV or RLV to transport persons or goods to and from space

"term "space" means outer space, including the Moon and other celestial bodies" “associated rights” - Art.I (2)(a) Protocol

– any permit, licence, authorisation etc granted or issued by (inter-) national body to control, use or operate a space asset… “which may be transferred or assigned, to the extent permissible and assignable under the laws concerned”
– all rights to payment due to debtor
– all contractual rights held by debtor

Relation with international space law

- primacy ?
- effects of "seizure" in case of default
  - jurisdiction and control
  - liability
  - state sovereignty
  - dual-use / sensitive technology
  - national space legislation

The Supervisory Authority of the Registry

- Aviation > ICAO
- Rolling Stock > OHTIP
- Space > United Nations
  - S-G ? COPUOS ? OOSA ?

Legal Sub-Committee UN-COPUOS

- single agenda item 2001
- "*ad-hoc* informal consultation mechanism"
  - September 2001 Paris
  - January 2002 Rome
- agenda item 2002

Situation end 2002

- Convention adopted 2001
- Draft Protocol
  - Space Working Group (Jan. 2002)
  - Steerings and Review Committee (Feb.2002)
  - Governmental Consultations 2003-2004
  - Diplomatic Conference: 2005 ?

Conclusion

- general expectation great potential
  - cost reduction
  - boost industry and applications
  - help developing countries
- interest EC/EU in Convention
  - start consultations member states
- fascinating int. public & private law-making exercise

EUMETSAT

- Intergovernmental organisation
- 18 European Member States
- Created in 1986
- Mandate ☒ Operational Meteorological Satellites

History

- **Early activities in CNES of France**
- **Europeanisation in ESA with own Programme Board**
  - pre-operational programme
  - operational programme
- **Creation of EUMETSAT**
  - Plenipotentiary Conferences in 1981 and 1983
  - Convention signed in May 1983
  - Convention entered into force on 19 June 1986
  - Why an intergovernmental organisation?

History cont'd

- **Secretariat**
  - First three Staff
  - After three years 20 Staff
  - Now staff complement of 177, and around 180 consultants
- **Mandate**
  - First "establish, maintain and exploit European systems of operational meteorological satellites";
  - Now, in addition, "contribute to the operational monitoring of the climate and the detection of global climate changes".

Programmatic Development

- First "cash register" to fund the continuation of ESA Meteosat activities.
- Then independent establishment of follow-on programme "Meteosat Transition Programme".
- Take-over of ground segment and of launcher procurement.

Programmatic Development cont'd

- Creation of Meteosat Second Generation (MSG) programme, three satellites, 12 years.
- Creation of EUMETSAT Polar System (EPS) programme, three satellites (Metop), 14 years.
- Opening of subscription to optional programme on Jason-2 (Altimetry).

EUMETSAT

International Cooperation

Main partners:

ESA - Develops satellites, procurement agent, joint signatory

NOAA - Joint programmes, back-up agreement

CNES - Instrument development

WMO - Part of worldwide network of meteorological satellites

The EUMETSAT Convention

- At first a “one-programme” Convention.
- Convention catered for new programmes, nevertheless.
- Convention changed, clarifying frame for new programmes, allowing for optional programmes, changed voting rules.
- From 16 ☒ 18 Member States.
- Development of Cooperating State concept.

The Use of EUMETSAT Data

- Meteosat data relevant for Europe <u>and</u> Africa
- Licence system - GNI dependent
- Training
  - courses - “train the trainer”
  - Computer Aided Learning Tools
- PUMA Project with EU - User Station for Africa
- African User Forum
- General User Forums

Lessons that could be learned

- Lead times are long
  - organisationally
  - technically
- The environment is dynamic⌧ formal framework must cater for development and change.
- International cooperation in various directions and at various levels is necessary.

NO MAN IS AN ISLAND

Bilateral and Multilateral Cooperation Agreements

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The international community is now widely using outer space. This is evidenced if you look at international news: to communicate via satellite, to forecast weather and to study our Earth's environment and the universe, to construct and use space stations, exploiting launching systems, planning manned bases on other planets or even sample return missions. Space missions today are largely international both in their planning and implementation. The degree of international cooperation, either bilateral or multilateral, of course depends on each situation, as there are numerous space activities carried out by States under which cooperation is actually undertaken, and the trend is clearly expanding.

A general overview of the subject matter needs to address both the aspect of the compound of self-interest of the Parties and of arrangements reflecting this, which I would define as general policy on space cooperation, and also look at the experience of specific provisions agreed between the interested parties within the existing system of space cooperation agreements.

Under the various types of international cooperation and within the meanings and effects of the generally accepted UN Resolution on cooperation and its inspiring principles, some ground rules are recognised virtually by everybody in the international scene. On the definition, content and political evolution of international cooperation in space activities, a particularly important guideline is the Declaration by the UN General Assembly, adopted at the 51st session, 1996: Declaration on international cooperation in the exploration and use of outer space for the benefit and in the interests of all States, taking into particular account the needs of developing countries UNGA(A/51/20). In article 2 it is clearly recalled: "States are free to determine all aspects of their participation in international cooperation in the exploration and use of outer space on an equitable and mutually acceptable basis."

To determine all aspects includes both the substance and the form, which establish each cooperative undertaking between States. So this intervention briefly addresses issues of substance and of the form taken by the arrangements used so far to set up international space cooperation.

In the first instance, the basic concepts and legal criteria of non-discrimination and open access are widely understood, accepted and used in this field. The politically legitimate expectation of a Government partner, usually a space agency, therefore the government committing to an activity, is frequently met along with the so-called *equitable and mutually acceptable basis* covering the cooperation.

The concrete space activity may also be carried out, on behalf of the contracting party, also by another government entity or private companies on mandate or contracts of the State. These are cases where content of cooperation is arranged or performed by several different entities within the same party. Therefore the detailed motivations and actual implementations may somewhat vary. It depends on how much the representatives of the contracting Party, often its Ministry of Foreign Affairs, still maintain a comprehensive view of the actual content which is produced over time and even more importantly on the actual benefits delivered and acquired by each side during the cooperation. Interests can also be fulfilled from a State's policy motivation to invest, as well as being an actor in space technology with a view to obtaining benefits for other, non-space systems.

When, as often happens, a space system that has been conceived and designed to be widely accessible, experience shows that the scientists, technicians and managers devoted to its elaboration devise a project culture that is very much oriented to the wide distribution of as much space data as possible as soon as they are available. A recent reversal of the trend, more based on consciousness of stringent financial environment and of security considerations, has been to move away from the strict influence of the project culture, moving towards the higher public policy objectives and justifications on the basis of which the public investment was afforded to the programme. Such issues have found their way into the language of many cooperation agreements.

Since space programmes require huge financial resources from public money, programme managers are looking more and more to justify acquisition of the technology, and are therefore putting emphasis on the value for the public in their pursuit for "political support". This interest is now found in growing importance in specific language developed in recent texts of international cooperative instruments that under diverse forms provide for cooperative use of outer space.

Many international cooperative agreements concluded recently indeed mention the common positions of the contracting States, such as: past achievements in science and technology, present common policy view on technology developments or trade issues, environmental concern, common perspectives and future plans in exploring and using outer space. Often such basic premises are turned into political motives, making reference to the mutual benefits for the interested parties in gaining a general access to the technology to be developed and for the greatly enhanced visibility of mutual benefits.

When we analyse the form of such large-scale arrangements, we see that there are several realistic and workable methods which devise functional solutions. As in general for most of the human activity, conclusive acts of the parties regulate *de jure* and *de facto* a large number of cases.

An interesting example of this is the case of a space agency that decides to run an early definition phase before launching its satellite into operations scheme. We have to remember that whatever is considered to be operational today began years ago as scientific or experimental. The resulting scheme of operations at the later stage is determined by the results of the early definition phase, which is correct, but often incomplete, as it did not deal with the international political scenario.

The large amount of cases and multiplicity of policy interests and positions, which are now animating the debate on space cooperation across the globe, is producing a wide range of cooperative instruments reflecting the different interests. It does not seem possible to reduce the formalism governing cooperation to one system, even if that system is a complex one.

Most of the time the cooperation agreement is concluded by the parties in a due written form, sometimes not, as the cooperative activities are based on a common understanding of what to do among members of an international scientific group or operational club. Knowing each other well and working side by side for many years in the same disciplines, they are used to meeting regularly at symposia, publishing their results, convening with the declared intention to formulate and to follow some practical ground principles established between them. So information internal to each party is exchanged, results of space missions, which required vast investment, are exchanged among the participants for the purposes determined in common. Reports of all these activities are openly published and made available also to non-participants, precisely to assert the seriousness and reliability of the group and of its results and its intention to develop and strengthen ties between members. All this cooperative action, without reservation being expressed by States, is properly arranged within the system of each party and acted upon in good faith by the representatives of the party, but is never formalized under a written international agreement. The concerned community seems very happy with such a solution and the practice of space cooperation is easily and largely expanded under informal, yet effective links.

On a more classical example, we have an agreement under public international law or a memorandum of understanding between space agencies, with the aim of making information available to each other for scientific and technological purposes and possibly plan and develop a common space mission. The government-to-government cooperation agreement may also include the possibility of further detailed arrangements to be defined later under a functional internal scheme of the respective space agencies of the contracting parties. The contracting parties maintain their supervision with a more or less strict control, or, on the contrary, under an internal scheme permitting wide distribution of information by the agency to other entities of the same government, where the agency is acting as the cooperation window agent for that government for the totality of the activities.

Sometimes such agreements also assume roles that are not strictly linked to the functions of the space project itself. The agreement may satisfy other needs, such as the formalising of the role of the procurement agency or its supporting intention, or even the need to establish external legitimacy in order to justify the claimed interest in a programme and therefore demonstrate its need to the government authorities to obtain funding. These are indirect, but often present material reasons, either appearing or not in the text of the cooperation agreement.

The above motives have no reason to be all equally reflected in the language expressing the terms and conditions for cooperation. In fact, these agreements also have some further ancillary functions such as those related to exchange of information and technical data, which would involve the need to exchange technical information or supply of services to ensure the correct understanding and a successful space mission. Such activities are often provided together with the technical data and are part of the same deal; the mere fact that one party cannot work without support from the other one is just one more test criterion of the cooperative nature of the relationship being set up.

Reflecting the common interest, agreement provisions are fine-tuned to express the relative expectations and framework of cooperation and understanding of each other’s position and acceptance of it, orally, tacitly or through formalised written agreement.

A typical example of this is the fact, accepted by the space users, that the language of the cooperation agreement to be concluded, be it at a formal level or just through an exchange of correspondence, is often based on a draft proposed and influenced by the culture and approach of the space agency which started planning for or managing the mission. In practice, whoever has control of the planning or of the initial invested budget, determines what form and content would suit them best, before they even characterize and propose to others the possible schemes of cooperation.

This is widely understood and accepted in the space community, so that in essence we can conclude that the principle of freedom of the legal form is affirmed, provided that, in the opinion of the proponent, it satisfies some essential technical and political requirements. These requirements can stretch very far and, as in the most sophisticated relationships, include a number of stringent and precise bilateral provisions and covenants.

Here document practice becomes easier to identify and to analyse, as more complex terms, taken from the legal experience and jargon of agreement language, are used. We also know and take account of the fact that similar language may mean different things under different legal cultures and systems, because legal systems differ. Understanding and being able to steer the cooperation around the different legal systems and cultures becomes an essential skill of the space negotiator.

Where an international concern or international organisation is the initiator, and especially when the agreement is multilateral and very much spread out between partners that have a history of long-standing relationships, the need for a strict reference to one applicable law diminishes and the task of interpretation is left up to the practitioner of the relationship for further interpretation. The truth is that, because of the give-and-take situation, many parties to such agreements consider themselves well enough protected by their relative factual positions not to need an immediate and enforceable reference to an applicable legal system. This does not mean, of course, that there is no applicable system at all. By virtue of the criteria of interpretation under international law, methods exist in order to resolve such disputes. Although, the parties know that the impact is limited. A good empirical gauge is the following: the higher the political importance given to an agreement, the less mandatory the mechanism for settlement of disputes.

In any case, the parties almost always tend to insert an article into the agreement providing for the settlement of disputes, which refers to consultation at the political level between the parties and ultimately refers to a conciliation or mediation procedure, or to an arbitration tribunal under internationally accepted rules of procedure, such as those from the Permanent Court of Arbitration or from the International Chamber of Commerce. Of course, one of the first issues that such an arbitration panel would consider when deciding on an applicable law, would be the original intent of the parties writing and interpreting the agreement.

Some agreement provisions clearly state that the parties recognise the full title and ownership over the technology of the one party as it holds it on the basis of previous programmes and government investments or simply because it owns the satellite, and therefore controls the most visible part of the cooperation such as the capability to produce results.

In other instances, such legal title is assumed by law and therefore not even mentioned. At this level, the cooperation agreement only provides for a general system of common management of the activities, and as the case may be, plus some authorisation by the title holder, a practice which is often called licence to use, to reproduce and distribute the results produced by the space mission.

One central issue is usually the liability regime of the cooperation and any possible solution towards apportionment. The usual clause calls for a classic cross-waiver of liabilities between the parties. We have quite some practice and far-reaching examples, including the possibility to extend the cross-waiver to others within each party, which would be affiliated entities actually carrying out the work as contractors. On the other hand, third party liability remains often a delicate issue, sometimes not dealt with accurately and not easy to resolve. Deserving of special mention is the extent to which international liability deriving from treaty, which is very firm in space activities, may be transferred between the parties by effect of the agreement's provisions, a matter to be explored further.

Very little has been legally proven before international courts in terms of compliance and validity of space cooperation agreements. Their enforcement mechanisms are often absent or very light. The fact that such agreements are not brought before a jurisdiction leaves the way open to the control of natural mechanisms, which are, on the contrary, well known in general theory of relationships. This does not, however, mean that we should forget the issue of legal qualification and protection of interests, via well conceived and written agreements.

Currently the system of space cooperation tends to become more complex, because of the need to demonstrate realistic benefits, including potential commercial uses. Also, recent practices and national legislation have to be taken into consideration when formulating the parties' undertakings and common rights on utilisation of the benefits arising out of the cooperation. We constantly live with situations where we have to work out how an international cooperative agreement can allow us to provide space sensitive technology to carry out the common mission, yet can comply with legislation, preventing to some extent the interest of the parties to channel all necessary information through one agreed scheme. The situation could, of course, be even more complex.

A strong, not so theoretical, example is a public administration at national, regional or local level with responsibilities vis-à-vis public interest in protection of the environment, holding information relating to the environment in the form of remote sensing data of whatever origin. There is a general obligation under environmental law to disclose any such information. Even if the satellite is American or Japanese, once the information is in European government hands, such public authorities are required to make such information available to any natural or legal person making a request without his having to justify his interest. The agreement can only follow up this case.

Relevant points are the financial arrangements and setting up of any consideration paid in this kind of cooperative scheme. Usually nothing is due as direct payment, as governments largely prefer to work on the principle of each party bearing its own costs with no transfer of resources, no exchange of funds. This is the consolidated practice and is substantiated under different forms with several formulas and provisions well known to space practitioners. However, it may somewhat vary according to the system in question, because high development costs of the technology used and volume of data invested may influence the financial conditions of the specific deal, up to the point of actually building a system of exchange of resources or providing some services in return for information. Some cooperation arrangements may have a commercial approach, while other space systems that have a more pre-operational or scientific preoccupation tend to ask for contributions in kind to the programme rather than payment of fees for a service. Royalties on technology used may also be payable by the requesting party and user.

In conclusion, quite peculiar and interesting situations have come to light through the various examples of international cooperation agreements practice. Such legal instruments still maintain their role of settlement of interests over international and complex transactions, containing a public interest. Where an economic value is asserted and appreciated in response to interest, the consideration is paid in different forms, either through a service rendered or by means of a different return or by royalty.

Sometimes the agreement does not solve all the potential issues, as it is incomplete just through unawareness of some issues. More often it may not be able to do so because of local regulations, policies and practices, preventing commonly satisfying solutions. Most of these agreements provide that the obligations of the granting party are made subject to the compliance to local or national laws and regulations. This demonstrates the limits of the power of the contracting party, which has no authority to regulate an economic sector, but must rather formalise an arrangement between parties, while preserving a mutual interest. This remains true for the space community at large.

The developing practice, due to the existence of numerous cooperation arrangements to come, and the increased number of actors on the international arena, will certainly produce a larger spectrum of out-of-the-ordinary cases, to be investigated further by lawyers and interested practitioners. The system of international space relations, although not challenged, seems, as in many other cases of brand new technology, not yet completely ready to receive the impact of new legislation on technology being presently enacted in some legal systems, to become directly applicable and regulated under such agreements. It is my personal wish to allow both substantiated interests and forms of the agreement to be recognized and therefore to develop with ease within such a flexible framework, whilst being confident that such flexibility will help space activities to evolve and improve for delivering the benefits mankind expects.

THE AUSTRALIAN SPACE ACTIVITIES ACT 1998:

BUILDING THE REGULATORY CAPACITY FOR A LAUNCH INDUSTRY

Ricky J. Lee*

Introduction

Australia has often been regarded as being highly suitable to the development of commercial launch services. This is the result of a rare combination of geographical, political and economic factors, including its sparse population density, stable climate, proximity to the equator, governmental stability, advanced technical, communications and transport infrastructure and a skilled workforce.[1] The efforts to develop commercial launch operations from Cape York Peninsula (Queensland) in the 1980s and the more recent proposals concerning Christmas Island (an external territory in the Indian Ocean), Gladstone (Queensland) and Woomera (South Australia) lend further support to Australia's claim to become a player in the global commercial launch sector. It was not surprising, therefore, that the Government acted quickly to implement a regulatory framework for space activities in 1998 when interest in an Australian commercial launch industry began to surface again.

Before 1998, there was no existing legislative or regulatory framework concerning launch activities in Australia. The Australian Government, in drafting the *Space Activities Act 1998* (Cth) (the "**Act**"), drew on the existing legislative and regulatory framework of various other countries, notably that of the United States.[2] The following objectives for the Act were cited when it was introduced into the Parliament in 1998:

a) to institute a comprehensive regulatory framework for space activities in Australia or those involving Australian interests;

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[1] See Organisation for Economic Cooperation and Development, IT POLICY OUTLOOK: AUSTRALIA (2002); Organisation for Economic Cooperation and Development, STATISTICS ON INTERNATIONAL TRADE IN SERVICES, PARTNER COUNTRY DATA AND SUMMARY ANALYSIS (1999); Economist Intelligence Unit, COUNTRY FORECAST: AUSTRALIA (2002); and Economist Intelligence Unit, COUNTRY REPORT: AUSTRALIA (2002).

[2] The Act was amended by the *Space Activities Amendment (Bilateral Agreement) Act 2001* (Cth) and the *Space Activities Amendment Act 2002* (Cth). This paper considers the Act and its subordinate *Space Activities Regulations 2001* (Cth), including the amendments made by the *Space Activities Amendment (Bilateral Agreement) Act 2001*, the *Space Activities Amendment Act 2002* and the *Space Activities Amendment Regulations (No 1) 2002* (Cth). All references in these footnotes to sections and regulations, unless otherwise indicated, relate to the Act or the Regulations respectively.

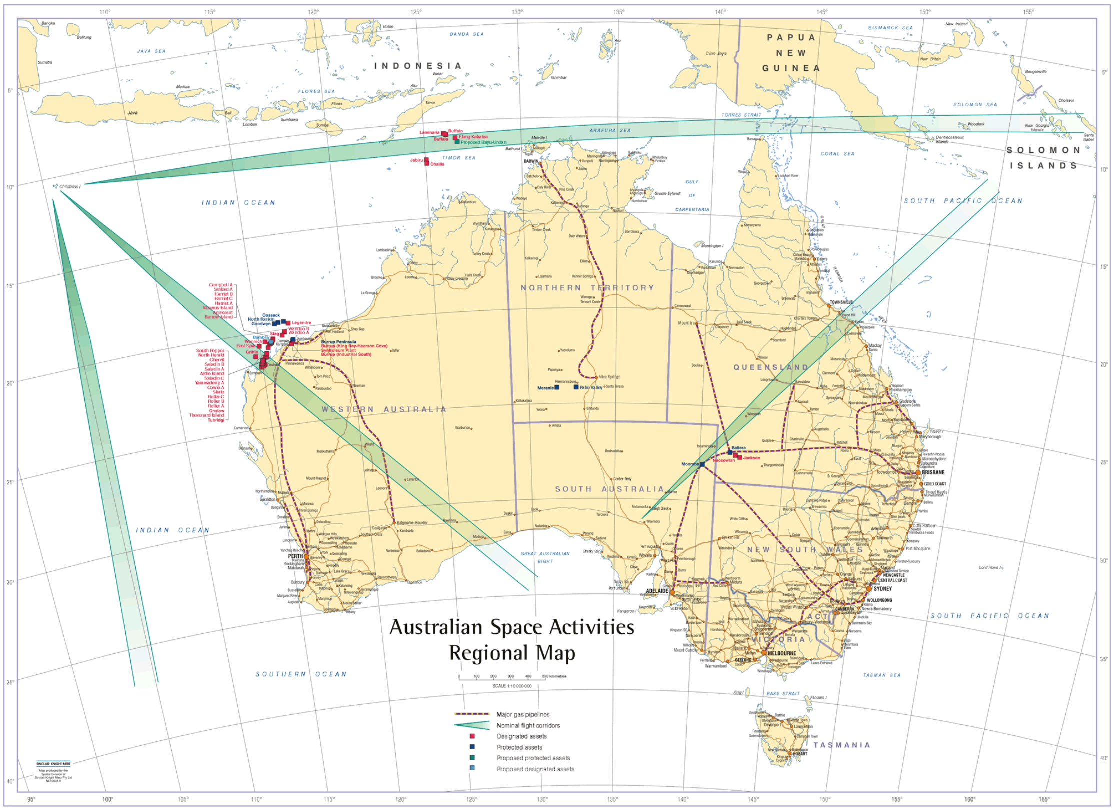
b) to enable Australia to attract investment in the launch sector by commercial and private interests, while ensuring that Australia meets its international obligations under the space treaties;

c) to pass on the liability of the Australian Government under the space treaties to private launch operators and to require them to have appropriate commercial insurance cover for themselves and the Government;

d) to establish a licensing and safety régime as well as to provide requirements for the safe launch from Australia and return to Australia of space objects; and

e) fundamentally, to "reflect in an Australian law, Australia's obligations as a signatory to the key United Nations space treaties and provide a legally certain and predictable environment for the development and operation of Australian space launch facilities".[3]

Figure 1. Australian Space Activities Regional Map[4]



This paper descriptively reviews in detail the provisions of the Act and its regulatory impact on the capacity of the Australian launch industry and measures it on its effectiveness in providing a certain and predictable environment for launch operators, as well as the potential for future reform of the regulatory framework. To this end, it is

[3] Explanatory Memorandum on the *Space Activities Bill 1998*, available from the Parliament of the Commonwealth of Australia at <http://www.aph.gov.au>, last accessed on 15 October 2002.
[4] Space Licensing and Safety Office, Department of Industry, Science and Resources, <http://www.industry.gov.au>, last accessed on 16 September 2002.

important to note the operative provisions of the Act and the regulatory burden the Act imposes on Australian private launch operators.

Implementation of the Space Treaties

Australia is party to all five United Nations space treaties:

a) 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 (the "**Outer Space Treaty**");[5]

b) the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the "**Rescue Agreement**"); [6]

c) the 1972 Convention on International Liability for Damage Caused by Space Objects (the "**Liability Convention**");[7]

d) the 1975 Convention on Registration of Objects Launched into Outer Space (the "**Registration Convention**");[8] and

e) the 1979 Agreement Governing the Activities of States on the Moon and other Celestial Bodies (the "**Moon Agreement**").[9]

It has been observed that the space treaties, except for the Moon Agreement, did not foresee the possibility of private or commercial space activities.[10] During the negotiations on the Outer Space Treaty, some States even advocated a governmental monopoly on space activities.[11] In the end, this view did not prevail as Article VI specifically provides for private, but "national", space activities to be carried out under the authorisation and continuing supervision of the governments.[12]

As the pace of commercialisation in space increased through the 1980s and 1990s, national governments began the task of reviewing the space treaties and the need for their domestic implementation. This was mainly in order to regulate private actors that may cause potential international liability of the governments to arise from space activities. Countries such as Sweden in 1982, the United Kingdom in 1986 and the United States in 1984 were, in varying degrees of complexity, the first to enact domestic

[5] (1967) 610 U.N.T.S. 205; 6 I.L.M. 386.
[6] (1968) 672 U.N.T.S. 119; 7 I.L.M. 149.
[7] (1972) 961 U.N.T.S. 187; 10 I.L.M. 965.
[8] (1975) 1023 U.N.T.S. 15; 14 I.L.M. 43.
[9] (1979) 610 U.N.T.S. 205; 18 I.L.M. 1434.
[10] Eilene Galloway, *Space Law in the 21st Century* (1988) 26 JOURNAL OF SPACE LAW 187; and Ricky J. Lee, *Reconciling Space Law with the Commercial Realities of the Twenty-First Century* (2000) 4 SINGAPORE JOURNAL OF INTERNATIONAL AND COMPARATIVE LAW 194.
[11] See, for example, discussion in Karl-Heinz Böckstiegel, *Commercial Space Activities: Their Growing Influence on Space Law* (1987) 12 ANNALS OF AIR AND SPACE LAW 175 at 179-180.
[12] Outer Space Treaty, Article VI.

space legislation.[13] These were followed by the legislative efforts of the Russian Federation and South Africa in 1993 and the Ukraine in 1996.[14]

Article VI of the Outer Space Treaty provides that "the activities of non-governmental entities in outer space … shall require authorisation and continuing supervision by the appropriate State Party to the Treaty" and that States bear international responsibility "for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty". At a cursory glance, the principles of the space treaties and others that would most require compliance by private actors through domestic legislation are:

a) the application and implementation of public international law to space activities;[15]

b) space to be used in the interest of maintaining international peace and security;[16]

c) the prohibition of weapons of mass destruction in space;[17]

d) the launching States of space objects are to be liable for damage caused to third parties;[18]

e) maintain a registry of space objects and furnish all the information required under the Registration Convention to the United Nations;[19]

f) avoid harmful contamination of outer space and any adverse changes in the Earth environment;[20] and

g) provide assistance and rescue to any returned astronauts and the recovery and return of any returned space objects to the launching States.[21]

In the Act, it is clear that the issue of liability is the predominant concern of the Australian Government. This narrow focus of the Parliament's concern in relation to the Government's obligations relating to space activities is strongly reflected in the Act and its requirements to reduce the risk and, correspondingly, the potential liability of the Australian Government for private launch activities as passed on to the launch operator.

Structure of the Act

The Act came into force in Australia when it received Royal Assent on 21 December 1998 and the Space Licensing and Safety Office ("**SLASO**") was created to administer it.

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[13] *Space Activities Act 1982* (Sweden); *Outer Space Act 1986* (UK); and *Commercial Space Launch Act 1984* (US).
[14] *Law on Space Activities 1993* (Russia); *Space Affairs Act 1993* (South Africa); and *Ordinance on Space Activities 1996* (Ukraine).
[15] Outer Space Treaty, Article III.
[16] *Ibid*., Article III.
[17] *Ibid*., Article IV.
[18] *Ibid*., Article VII, and the Liability Convention, Articles II and III.
[19] Outer Space Treaty, Article VIII and the Registration Convention, Articles II and IV.
[20] Outer Space Treaty, Article IX.
[21] Rescue Agreement, Articles 1 to 5.

Since then, the Act was amended in 2001 by the *Space Activities Amendment (Bilateral Agreement) Act 2001* (Cth) to implement a bilateral agreement with the Russian Federation for cooperation on private launch activities. Further, the *Space Activities Amendment Act 2002* (Cth) was enacted in October 2002 to make various rectifying amendments and changes to the applicability and liability provisions as well as the introduction of special arrangements for scientific or educational space activities.

The Act provides for regulations, a form of subordinate or delegated legislation that do not require parliamentary enactment, to be enacted where necessary and convenience to give effect to the Act.[22] As a consequence, most of the necessary administrative details of the regulatory framework were left to the *Space Activities Regulations 2001* (Cth) (the "**Regulations**").[23] As the Act commenced in December 1998 and the Regulations did not enter into force until 28 June 2001, there was in effect a thirty-month long moratorium on Australian launch activities during that time.

It should be noted that the Act merely forms the principal part of the regulatory framework of private launch activities and there are several other laws that directly relate to the conduct of launch activities by private launch operators. Except where relevant, it is not the intention of this paper to discuss the details of those laws. These laws include:

a) the *Radiocommunications Act 1992* (Cth), regulating the frequency and apparatus use in the ground control facilities and on board the launch vehicle and/or the payload;

b) the *Civil Aviation Safety Regulations 1998* (Cth) and, in particular, Part 101 thereof, which came into force on 1 July 2002 and deals with airspace clearances and airspace exclusion areas for space launch operators;

c) the *Customs (Prohibited Exports) Regulations 1958* (Cth) that implements Australia's international obligations concerning export controls on rocket, missile and satellite technologies, such as those under the Wassenaar Arrangement on Export Controls for Conventional arms and Dual Use Goods and Technologies and the international Missile Technology Control Regime;[24]

d) the *Transport Safety Investigation Bill 2002* (Cth), currently proceeding through the Senate, regulates all accident investigations conducted by the Australian Transport Safety Bureau (the "**ATSB**");

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[22] Regulations are a form of legislative instrument that, in this case, are made by the Governor-General of Australia on advice of the Cabinet. Although they do not require parliamentary approval, they must be tabled in both Houses of Parliament within fifteen sitting days of their enactment and may be disallowed by either House of Parliament within twelve sitting days: see the *Acts Interpretation Act 1901* (Cth).

[23] The Regulations was amended on 3 July 2002 by the *Space Activities Amendment Regulations (No 1) 2002* (Cth) and it is anticipated that the enactment of the *Space Activities Amendment Act 2002* will necessitate further amendments to the Regulations. The Senate Standing Committee on Regulations and Ordinances gave notice of motion to disallow the Regulations in the Australian Senate was given on 20 September 2001 because of the legislative requirement for private information about employees and deemed employees to be provided to the Government. The notice of motion was subsequently withdrawn on 27 September 2001 as a result of assurances from the Government that all employees and deemed employees are to be notified of the launch operator's disclosure obligations under the Act.

[24] Wassenaar Arrangement, <http://www.wassenaar.org>, last accessed on 18 October 2002; and the Missile Technology Control Régime (1987) 26 I.L.M. 539.

e) the *Christmas Island Space Centre (APSC Proposal) Ordinance 2001* and the corresponding *Christmas Island Space Centre (APSC Proposal) Regulations 2001*, which are legislative instruments for Christmas Island and relate to the ongoing construction and use of land for a commercial launch facility on Christmas Island;[25] and

f) the *Customs Tariff Amendment (No 4) Act 2001* (Cth), which amends the *Customs Tariff Act 1995* (Cth) to provide for the exemption of the goods and equipment imported into Australia in direct connection with a space launch from import duties and tariffs.[26]

The Act is divided into nine parts, of which:

- Parts 1 and 2 contain introductory and definitional provisions;
- Part 3 sets out the licences, permits, approvals and authorisations relating to private space activities;
- Part 4 provides for a régime to regulate and approportion the international and domestic liability of launch operators;
- Part 5 creates a Register of Space Objects and the requirement to furnish the necessary information to the United Nations register;
- Part 5A, inserted by the *Space Activities Amendment (Bilateral Agreement) Act 2001*, provides a framework for implementation of specified space cooperation agreements, such as the bilateral agreement signed with Russia in 2001;
- Part 6 deals with civil penalties under the Act;
- Part 7 deals with the investigations of launch incidents or accidents; and
- Part 8 contains constitutional and other miscellaneous provisions.

The Liability Convention prescribes liability for launch activities on States that launch or procures the launch of a space object and the States from whose territory or facility the space object is launched.[27] As a result, the Australian Government is seeking to require regulatory approvals for private launch activities conducted in Australia and those conducted overseas by Australian nationals. This is reflected in the categories of regulatory approvals provided under the Act.

[25] A motion to disallow the *Christmas Island Space Centre (APSC Proposal) Ordinance* and the corresponding *Christmas Island Space Centre (APSC Proposal) Regulations* was moved by the Australian Greens on 19 June 2002 on the basis that they did not provide adequate environmental safeguards and public consultations in the construction of the launch facility on Christmas Island by Asia Pacific Space Centre Pty Limited. The motion was defeated on 20 June 2002 with all other parties all voting against the disallowance motion.
[26] Australian Customs Notice No. 2001/48.
[27] Liability Convention, Article I.

REGULATED SPACE ACTIVITIES

Introduction

In all other States with legislative or regulatory frameworks for space launches, private space activities are generally regulated by an all-inclusive licence.[28] In Australia, on the other hand, the Act provides for the several different categories of regulatory approvals for different types of launch activities and they are as follows:

- a **Space Licence** for operating a launch facility in Australia in conjunction with a specific launch vehicle along particular flight paths;[29]

- a **Launch Permit** for a launch operator to launch a space object or a series of space objects from Australia and any associated returns, either the launch vehicle or the payload, to Australia;[30]

- an **Overseas Launch Certificate** for an Australian satellite owner to launch a space object or a series of space objects overseas;[31]

- an **Authorisation of Return** for the return to Australia of a space object that was launched from overseas;[32] and

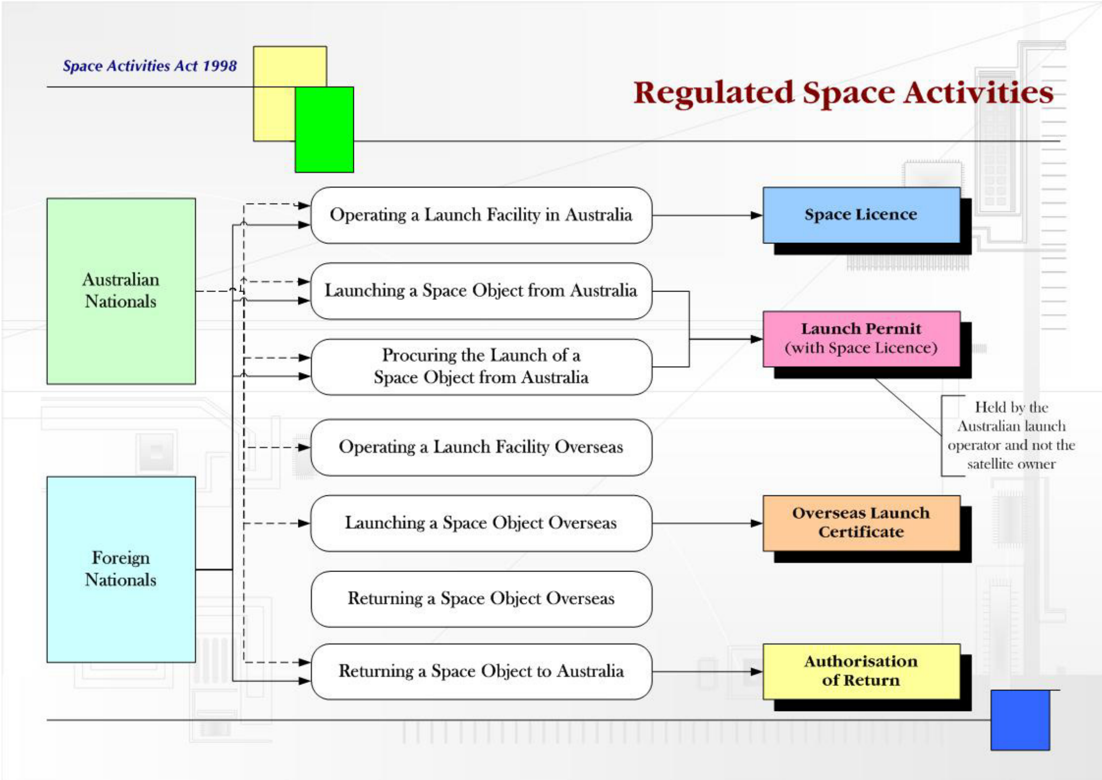
- an **Exemption Certificate** to provide for emergency launches.[33]

In the case of "**approved scientific or educational organisations**", the Act subjects them to the same regulatory burden as commercial launch operators, but the fees payable in relation to each required licence are substantially reduced.[34] The Act requires the Government to enact guidelines on the criteria for an organisation to be declared as an approved scientific or educational organisation and, with the enactment of the *Space Activities Amendment Act 2002*, this is likely to occur in the near future.[35]

Launch Permits, Overseas Launch Certificates and Authorisations of Return all require the relevant applicant to satisfy the insurance or financial responsibility requirements imposed in Division 7 of Part 3 of the Act. This is intended to provide both the launch operator and the Australian Government with insurance cover for their liability to Australian and foreign third parties. The criteria, required documents and the conditions for each of the licences are discussed below.

[28] See *Commercial Space Launch Act 1984* (US); *Outer Space Act 1986* (UK); *Space Affairs Act 1993* (South Africa); and *Space Activities Act 1982* (Sweden)
[29] Section 15.
[30] Sections 11 and 26.
[31] Section 12.
[32] Section 14.
[33] Section 46 and Regulation 6.01.
[34] Section 59(6A).
[35] Sections 8A and 8B.

Figure 2. Regulated Space Activities under the Act



Space Licences: Operating a Launch Facility

<u>CRITERIA FOR GRANTING A SPACE LICENCE</u>

Each Space Licence is granted by the Government to cover a particular launch facility, a particular kind of launch vehicle and particular flight paths.[36] In other words, if a launch operator changes the launch vehicle being used or the flight paths specified in the Space Licence, it will require a variation or the grant of a new licence.

With the Space Licence and the Launch Permit, the Act separates the approval for the launch facility, launch vehicles and particular flight paths from that of the particular launch. In other words, the grant of a Space Licence is a prerequisite to the application of a Launch Permit to undertake a specific launch. This separation was made with the intent of streamlining the approval process for specific launches and, as a result, improves the competitiveness of the Australian launch industry. However, the complexity of the regulatory régime, especially in relation to flight safety concerns, would appear to nullify any benefits derived from the arrangement.

The following basic criteria apply to an Australian launch operator before a Space Licence would be granted:

[36] Section 18.

a) demonstrated competence of the launch operator, or its key personnel, to operate the launch facility and the launch vehicle;[37]

b) obtaining all necessary environmental approvals and, unless required under another Australian law, the preparation of an Environmental Plan for monitoring and mitigating any adverse effects of the launch facility on the environment;[38]

c) the risk to public health and public safety posed by the launch facility, launch vehicle or the flight paths are "as low as reasonably practicable", or the lowest practicable risk outcomes within the bounds of reasonable cost;[39]

d) there are no reasons arising from Australia's national security, foreign policy or international obligations that make the grant of the Space Licence to the applicant undesirable;[40] and

e) the launch facility and the launch vehicle must be effective and safe for their intended purposes.[41]

These requirements are reflected in the information and documents to be submitted by the launch operator in the application process.

THE APPLICATION PROCESS

If a launch operator wishes to apply for a Space Licence, it must include the following documents as part of its application to SLASO:

a) documents relating to the launch operator's organisational structure and financial standing, including information concerning the chain of command, duties and responsibilities of each position, the launch operator's financial management system and its audited finances;[42]

b) documents relating to the experience and competence of the key personnel of the launch operator, including its directors, its chief executive officer and other persons involved in the management, operations, maintenance and quality assurance processes of the launch facility or the launch vehicle;[43]

c) a Program Management Plan for the launch facility and the launch vehicle;[44]

d) design and engineering plans for the launch facility and/or documents concerning a "technical recognition instrument" between Australia and another country that recognises the safety and effectiveness of the facility or the proposed facility;[45]

37 Section 18(a).
38 Section 18(b).
39 Section 18(d).
40 Section 18(e).
41 Regulations 2.02 and 2.03.
42 Regulations 2.06(4)(a) and 2.10(1)(a).
43 Regulation 2.06(4)(b).
44 Regulations 2.06(4)(c) and 2.11.

e) evidence of compliance with all relevant environmental laws and, if not required by any other Australian law, the provision of an Environmental Plan;[46]

f) a Flight Test Plan for new or substantially modified launch vehicles;[47]

g) a Technology Security Plan for ensuring the security of technology used by the launch operator from being unlawfully acquired and/or exported;[48]

h) an Emergency Plan for detailing procedures dealing with incidents or accidents at the launch facility or in relation to the launch vehicle;[49] and

i) documents containing all relevant engineering details, technical specifications, standards compliance programs and other technical information relating to the launch vehicle or any technical recognition agreement relating to it, especially in relation to the on board structural, propulsion, fuel, electrical, electronic and flight safety systems.[50]

The **Program Management Plan** for a launch facility and the specific launch vehicle involves descriptions of strategies and practices relating to the control and operation of the launch facility and the launch vehicle.[51] The Program Management Plan also includes practices and procedures for quality assurance, document management, maintenance and service of the launch facility and the launch vehicle as drafted with the flight safety considerations in mind.[52]

The **Environmental Plan**, if required in connection with a launch facility, must set out the launch operator's arrangements to monitor and mitigate adverse effects on the environment.[53] The Environmental Plan must set out the procedures for implementing, reporting and reviewing the Plan by the launch operator.[54] The Act requires a suitably qualified and experienced person to independently assess the Environmental Plan for its adequacy in protecting the nearby environment.[55]

The **Flight Test Plan** is required for a new launch vehicle or one that has been newly and substantially modified from an existing model.[56] For the purposes of the Regulations, a

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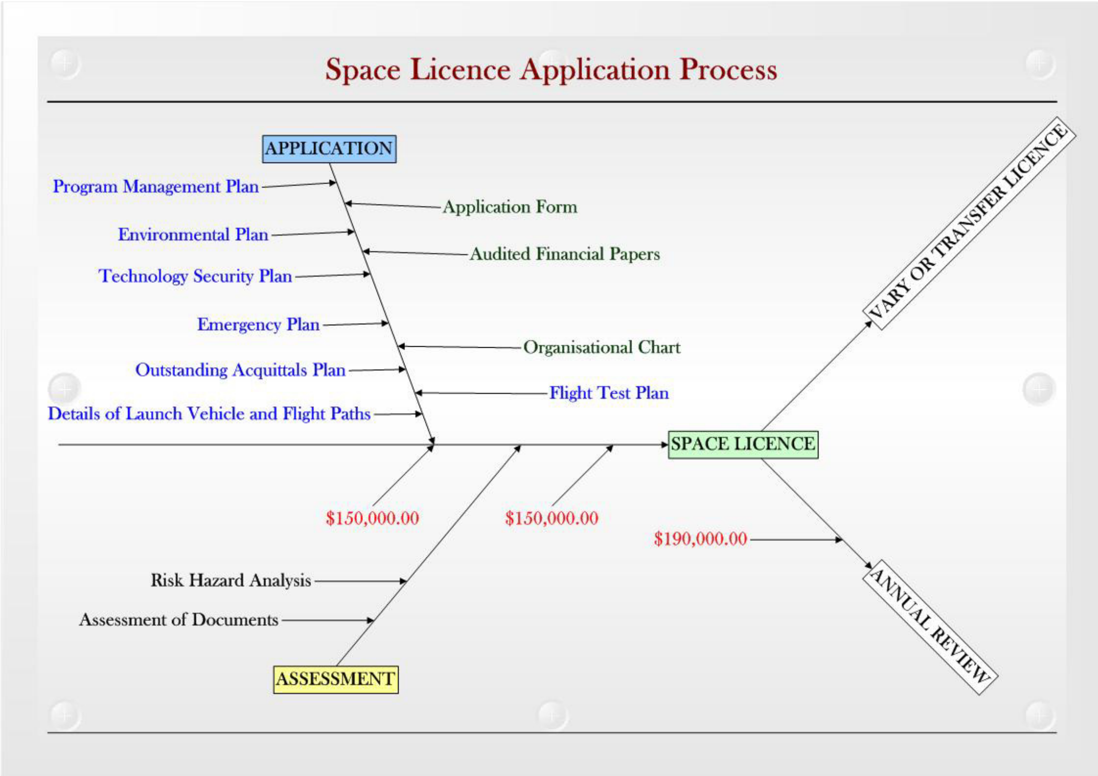
[45] Regulation 2.06(4)(d) and (da).
[46] Regulation 2.08(4). The relevant environmental legislation that may apply to a launch operation include the *Environmental Protection and Biodiversity Conservation Act 1999* (Cth), which applies to federal areas and declared wetlands, world heritage properties and in relation to activities affecting certain protected species. In addition, the environmental legislation of the states and territories may have application instead of or in concurrence with the federal law, such as the *Environmental Protection Act 1986* (WA), the *Environment Protection Act 1993* (SA) or the *Environmental Protection Act 1994* (Qld). It is only where an environmental plan is not required under any of these laws would the launch operator be required to submit one with the Space Licence application.
[47] Regulations 2.06(4)(e) and 2.12.
[48] Regulations 2.06(4)(f) and 2.13.
[49] Regulations 2.06(4)(g) and 2.14.
[50] Regulations 2.06(4)(k) and 2.15.
[51] Regulation 2.11.
[52] *Ibid*.
[53] Regulation 2.17(1).
[54] Regulation 2.17(2).
[55] Regulation 2.08(4)(j).
[56] Regulation 2.08(7).

launch vehicle is regarded as having been substantially modified, thus requiring a Flight Test Plan, if its engine, navigation system, flight control system, flight termination system or strap-on boosters have been changed or replaced.[57] The Flight Test Plan must provide for the conduct of test flights, including the use of flight tracking systems, the testing of launch procedures, termination procedures for test flights and the recording and reporting of the test results to the Government.[58]

Figure 3. The Space Licence Application Process



The need for a **Technology Security Plan** stems from the international obligations that Australia has under export control agreements to prevent nuclear, rocket, missile, satellite, flight guidance and targeting technologies from leaving Australia and falling into the wrong hands. The Technology Security Plan is required to set out the practices adopted by the launch operator to protect the technology from unauthorised access or use.[59] If a bilateral or multilateral agreement exists concerning the import and use of specific technologies into Australia, the Technology Security Plan must detail the steps and procedures adopted by the launch operator to protect the technology that is the subject of such agreements.[60]

The **Emergency Plan** for a launch facility and launch vehicle sets out the practices of the launch operator in responding to an emergency occurring at the facility or on the launch

[57] Regulation 2.08(8).
[58] Regulation 2.12.
[59] Regulation 2.13(1)(a).
[60] Regulation 2.13(1)(b). Article 12 of the Agreement between the Government of Australia and the Government of the Russian Federation on Cooperation in the Field of the Exploration and Use of Outer Space for Peaceful Purposes (the "Intergovernmental Agreement") provides for such an agreement, presently being negotiated.

vehicle. The Emergency Plan must also contain a list of the relevant authorities to be contacted and the arrangements for coordinating actions concerning an emergency.[61] The Emergency Plan must also incorporate evacuation procedures and the processes for testing and review of the procedures contained in the Plan.

In addition to the documents referred to above, the launch operator is also required to submit an **Outstanding Acquittals Plan** that sets out all other approvals, or authorisation, required for the construction or operation of the launch facility or the launch vehicle along specified flight paths.[62] Examples of such outstanding authorisations and approvals include permits for frequency use in telemetry systems, airspace clearances and land use planning issues that are not covered by the Act.

CONDITIONS AND FEES

During the term of a Space Licence, the launch operator is required to:

a) provide any information reasonably and lawfully requested by the Government that relate to the Space Licence;[63]

b) allow access to the facility and provide any information or assistance reasonably requested by the appointed Launch Safety Officer;[64]

c) comply with the approved Program Management Plan;[65]

d) comply with the approved Flight Test Plan, if one is required;[66]

e) comply with the approved Technology Security Plan;[67]

f) comply with the approved Emergency Plan;[68]

g) comply with the approved Environmental Plan;[69]'

h) provide all relevant information, including qualifications, duties, functions and contact details, of each relevant employee when requested and maintain records of such information for seven years;[70] and

i) comply with any direction lawfully given by the Government in revising any of the plans or information referred to above.[71]

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[61] Regulation 2.14.
[62] Regulation 2.16.
[63] Sections 20(a) and 60.
[64] Section 20(b).
[65] Regulation 2.04(2)(a).
[66] Regulation 2.04(b).
[67] Regulation 2.04(c).
[68] Regulation 2.04(d).
[69] Regulation 2.04(e). It should be noted that the technology and technical information concerning launch vehicles and satellites are subject to various export control regimes, such as the International Traffic in Arms Regulations of the United States. The Australian export control régime is found in the *Customs (Prohibited Exports) Regulations* (Cth).
[70] Regulation 2.04(j).

As a result of the detail involved in the preparation and consideration of a Space Licence, it is expected that an application for a Space Licence would take between six months to a year to complete. It is also unclear whether a launch operator is required to hold a Space Licence before or during the construction of the launch facility. Launch operators have found it prudent in any event to begin the application process during the construction of the launch facility. An application fee of A$300,000 is payable, with half to be paid when the application is submitted and the remainder to be paid within four months of the application.[72] The Government has proposed to introduce an annual renewal fee of A$190,000 and a fee of A$3,000 for approved scientific or educational organisations.[73]

The cost of obtaining and maintaining a Space Licence must be considered in conjunction with the length of the term of the Space Licence, which may be up to twenty years.[74] In order to ensure continuing compliance, the Act provides that the Government may undertake an annual review of a Space Licence to monitor compliance with the Act and, if any of the conditions are breached, the Government may suspend or revoke the Space Licence.[75] As no Space Licence has been granted by the Government to date, a practical example is lacking for a study of the regulatory and financial impact of the Space Licence on a commercial launch operator.

Launch Permits: Launching from Australia

CRITERIA FOR GRANTING A LAUNCH PERMIT

Launch Permits are required to authorise single launches or series of launches of the same or similar payloads.[76] Launch Permits may also provide for the return of launch vehicles and/or space objects back to Australia, provided that the return is "connected" with the launch.[77] While this clearly covers the return of a reusable launch vehicle as being connected with the launch, this creates uncertainty in the case of returning the space object. If the return of the space object is connected with the launch, then a launch operator may be responsible and liable for the satellite operator returning the satellite with which the launch operator has no control. On the other hand, if the return of a satellite is not connected with a launch, then the Act in fact does not provide for returns of Australian-launched payloads except by means of an Exemption Certificate, for Authorisations of Return only deal with overseas-launched space objects. As an Exemption Certificate is intended for emergency space activities only, the Australian Government can rectify this issue simply by including Australian-launched space objects in the scope of an Authorisation of Return.

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[71] Regulation 2.04(6).
[72] Section 59 and Regulation 9.04. Pursuant to the *A New Tax System (Goods and Services Tax) Exempt Taxes, Fees and Charges Determination (No 2) 2000* (Cth) of the Australian Taxation Office, licence fees paid under the Act are not subject to the payment of Australian goods and services tax.
[73] Discussion with Dr. Michael Green, Space Licensing and Safety Office, 6 November 2002.
[74] Section 19.
[75] Sections 25, 25A and 18.
[76] Sections 11 and 26.
[77] Section 26(2).

As the demarcation between airspace and outer space remains unclear in the context of international law, some means of defining the applicability and scope of the Act is required. In the United States, a launch involving a rocket of less than two hundred thousand pounds per second of impulse and a ballistic coefficient of less than twelve pounds per square inch does not require a licence.[78] The Australian Government has opted instead to set an applicability threshold as defined by altitude, so that a launch taking place in Australia will need to be licensed if the launch vehicle and/or payload is intended to reach an altitude of one hundred kilometres above mean sea level or higher.[79]

The following basic criteria apply before a Launch Permit would be granted:

a) a valid Space Licence held by the launch operator;[80]

b) demonstrated competence of the launch operator or its personnel in undertaking launch activities and any associated returns;[81]

c) demonstrated ability to satisfy the insurance and financial responsibility requirements of the Act;[82]

d) the risk of substantial harm to public health and public safety is as low as reasonably practicable;[83]

e) the space objects launched do not carry nuclear weapons or other weapons of mass destruction;[84] and

f) there are no reasons arising from the interests of Australia's national security, foreign policy or international obligations that make the grant of a Launch Permit to the applicant undesirable.[85]

THE APPLICATION PROCESS

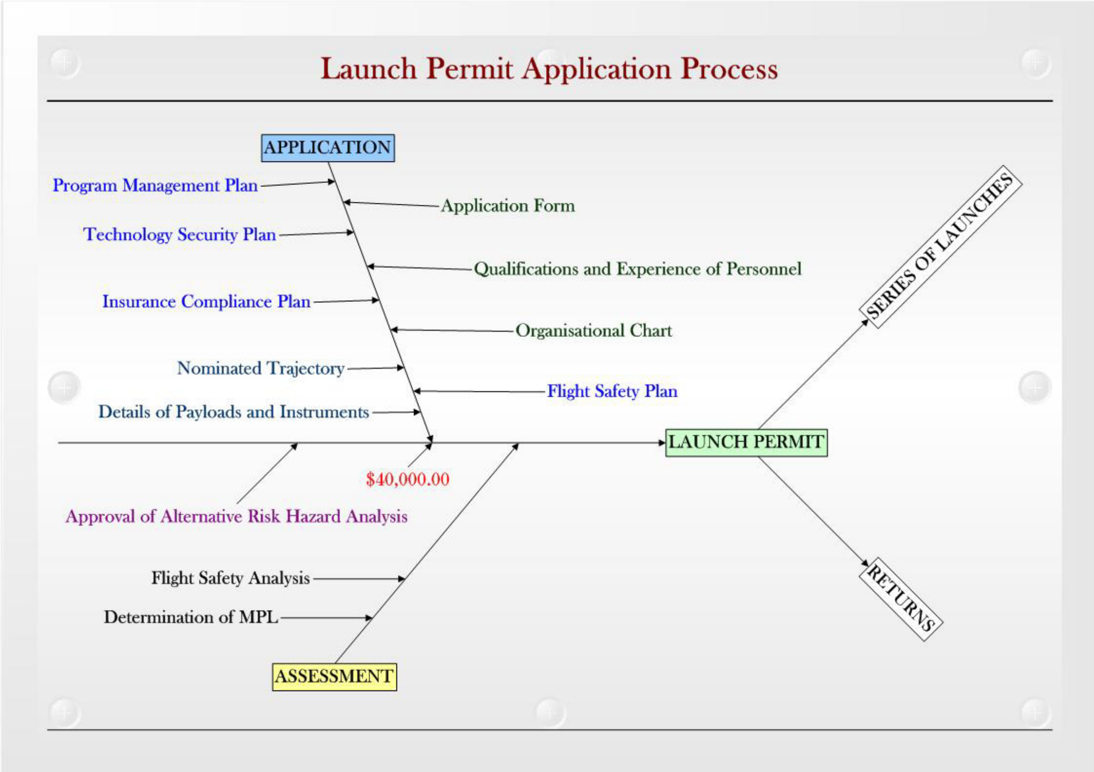
If a launch operator wishes to apply for a Launch Permit, it must include the following documents as part of its application to SLASO:

a) specifications and information relating to the payload, such as its manufacturer, intended uses and the sensors carried on board;[86]

b) details of the nominated trajectory for the launch and any associated return;[87]

[78] *Commercial Space Launch Regulations* (U.S.) 14 C.F.R. 400.2.
[79] Section 8.
[80] Sections 26(3)(a) and 27.
[81] Section 26(3)(c).
[82] Section 26(3)(d).
[83] Section 26(3)(e).
[84] Section 26(3)(f).
[85] Section 26(3)(g).
[86] Regulation 3.04(1)(e) and (f).
[87] Regulation 3.04(1)(g).

Figure 4. Launch Permit Application Process



c) information required by Article IV of the Registration Convention, including the proposed orbital parameters, the owners and the function of the payload;[88]

d) a statement setting out the qualifications and experience of each person connected with the payload and its systems, structure and software;[89]

e) a risk hazard analysis, carried out either independently or by an employee of the launch operator, that meets the launch safety standards contained in the Flight Safety Code as carried out in accordance with the "Risk Hazard Analysis Methodology" contained in the Flight Safety Code or, if an alternative methodology for risk hazard analysis has been approved, a risk hazard analysis in accordance with that alternative methodology;[90]

f) a Program Management Plan for the launch;[91]

g) a Technology Security Plan for the launch;[92]

h) a Flight Safety Plan;[93]

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[88] Regulation 3.04(1)(h).
[89] Regulation 3.04(4)(b).
[90] Regulation 3.04(4)(c). Regulation 2.06(5A) provides that an alternative methodology for a risk hazard analysis must be certified by an appropriately qualified and experienced expert as being scientifically sound and will serve the same purpose as the methodology contained in the Code.
[91] Regulation 3.04(4)(h).
[92] Regulation 3.04(4)(i).

i) an Insurance Compliance Plan to demonstrate compliance with the insurance and financial responsibility requirements of the Act;[94] and

j) an adequate Environmental Plan for conducting the launch is in place.[95]

The **Program Management Plan** for launches provides for the procedures in conducting the launch and any associated return, including ground and flight safety procedures.[96] The Program Management Plan must also contain procedures for changing flight arrangements, payloads and key personnel as well as detailing the communications arrangements for the launch and any associated return.[97]

The **Technology Security Plan** for launches is similar to the one for launch facilities and launch vehicles in that it requires the launch operator to demonstrate that it has safeguards in place to prevent unauthorised access or use of technology relating to the launch and any associated return.[98] Similarly, it also requires the launch operator to comply with any existing bilateral or multilateral agreement concerning transfers of the relevant technologies to which Australia is a party.[99]

The **Environmental Plan** for launches is similar to that for the Space Licence in that it provides for the arrangements and procedures to monitor and mitigate any adverse effects on the environment arising from the launch.[100] It must also provide for the procedures to review, report and implement the Environmental Plan.[101]

FLIGHT SAFETY

The **Flight Safety Code** (the "**Code**") is a document separate to the Act and the Regulations which sets out the requirements for launch operators to demonstrate the safety and effectiveness of their proposed launch activities. The Code sets out the safety standards that have to be complied with by launch operators and the Regulations require launch operators to undertake a risk hazard analysis in compliance with the Code, carried out either independently or by an employee of the launch operator,. In an application for a launch permit, the launch operator is required to submit a **Flight Safety Plan** to demonstrate its compliance with the Code.[102]

The Code measures the risk to public health and safety by calculating the "**Casualty Expectation**", or E_C, being the average number of casualties that can occur as a result of an event if the event were repeated thousands of times.[103] With the risk of oversimplifying it, the Casualty Expectation of a launch can be calculated by:

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[93] Regulation 3.04(4)(j).
[94] Regulation 3.04(4)(k).
[95] Regulation 3.01(2).
[96] Regulation 3.08(a).
[97] Regulation 3.08.
[98] Regulation 3.09(1)(a).
[99] Regulation 3.09(1)(b).
[100] Regulation 3.12(a).
[101] Regulation 3.12(b).
[102] Regulation 3.04(4)(j).
[103] Space Licensing and Safety Office, FLIGHT SAFETY CODE (2nd ed., 2002), para. 2.1.

$$E_C = P_E \times P_{IIE} \times N_F \times A_C \times \frac{N_P}{A_P}$$

where:

- P_E is the probability of the event, which can be the probability of failure of a particular event occurring in a particular interval of flight time;
- P_{IIE} is the conditional probability given the event during a particular interval of flight time that fragments of a particular type will land on the Casualty Area;
- N_F is the number of fragments of the type of fragments referred to above that are likely to be generated;
- A_C is the "Casualty Area" associated with each fragment in which an individual is a casualty due to direct fragment impact or, in other words, the size of the area that one piece of the fragment would cause a casualty if a person is in the area; and
- N_P / A_P is the population density of the Casualty Area.[104]

Table 1. Minimum Australian Launch Safety Standards

SPECIFIC RISK	STANDARD
Maximum permitted third party collective risk (the sum of all individual risks)	1×10^{-4} per launch
Maximum permitted third party individual risk	1×10^{-7} per launch
Maximum permitted third party individual casualty risk on a per year basis	1×10^{-6} per year
Maximum permitted probability per launch of debris impact on a Designated Asset	1×10^{-5} per launch
Maximum permitted probability per year of debris impact on a Designated Asset	1×10^{-4} per launch
Maximum permitted probability per launch of trigger debris impact on a Designated Asset	1×10^{-7} per launch
Maximum permitted probability per year of trigger debris impact on a Designated Asset	1×10^{-6} per launch

In the case of a commercial satellite launch, the probabilities of all events in each phase or time interval of the launch process are considered. Therefore, the total collective Casualty Expectation is the sum of the E_C values for all applicable time intervals, which in turn are calculated by the sum of the E_C values for all modes of failures. This is generated from the assumed rates of the failure modes and multiplying those rates with the duration of the flight time interval.[105] In this cumulative process, slight adjustments have to be made to the Casualty Expectation of each time interval to account for the

[104] *Ibid.*, para. 4.2.5.
[105] *Ibid.*, paras. 4.2.6-4.2.14.

probability of the launch not having failed in the previous time interval, even though this adjustment may be so small as to be negligible. In order for a Flight Safety Plan to be approved, the Casualty Expectation calculated must not exceed the minimum launch safety standards prescribed in the Code as set out in Table 1.

The Code also gives special consideration to the destructive effects of trigger debris on assets of high value or national significance. The Code defines "**trigger debris**" as debris of a particular shape, weight, velocity or explosive potential that can trigger a catastrophic chain of events on a Designated Asset or Protected Asset.[106] The quantity and type of trigger debris produced in association with a particular failure event is determined on the basis of expert engineering analysis and either agreed to by the launch operator and the owner of the asset or as determined by the Government in the absence of agreement between the parties.[107] The Designated Assets and Protected Assets are determined and declared by the Government and published in the List of Designated and Protected Assets.[108]

Designated Assets are assets that require special protection as a result of their remoteness and inaccessibility as well as the impact of their destruction on the Australian economy and its exports.[109] The list of Designated Assets currently includes oil and natural gas facilities located in the Timor Sea, the Carnarvon Basin off the Western Australian coast and the Cooper Basin in South Australia, reflecting the likely flight paths of the existing Australian launch operators as indicated in Figure 1.[110] A launch must take into account the higher standards of risk management required in relation to Designated Assets, as set out in Table 1.

Protected Assets are assets that underpin the economic activity of a whole region, a state or Australia as a whole and reflect the concern that the Australian Government has for the protection of the oil and gas industry from a possible catastrophe arising from space launch activities.[111] A launch must not have a Protected Asset within ten kilometres of the 1×10^{-7} impact probability isopleth for trigger debris.[112] It was recently estimated by the Western Australian Government that damage to an offshore oil and gas facility by trigger debris may amount to A$25 billion, not including the likely economic loss arising from such damage.[113] The following facilities have been listed as Protected Assets:

- the Burrup Peninsula, North Rankin and Goodwyn platforms and natural gas facilities, being the main gas supplies for Western Australia and for export;
- the Cossack floating facility producing oil and gas for export;
- the Ballera natural gas facility that constitutes the main gas supply for Brisbane and coastal Queensland;

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[106] *Ibid*., para. 3.2.5.
[107] *Ibid*., para. 3.2.6.
[108] Space Licensing and Safety Office, *Administrative Arrangements for the Classification of Assets for Space Launch Activities*, 7 June 2002.
[109] Space Licensing and Safety Office, *List of Designated and Protected Assets*, 17 June 2002, p. 7.
[110] *Ibid*.
[111] *Ibid*.
[112] Flight Safety Code, *supra* note 103, para. 3.2.7.
[113] Senate, Official Hansard of Parliamentary Debate (17 October 2002), p. 5319.

- the Moomba natural gas facility that constitutes the main gas supply for Adelaide, Canberra, Sydney and rural New South Wales;

- the Palm Valley and Mereenie natural gas facilities that supply all the gas requirements of the Northern Territory; and

- the proposed Bayu-Undan platform to produce natural gas for large parts of Australia and to be a major revenue source for East Timor.[114]

In creating designations of high-value assets and requiring the risk hazard analysis process to take them into special consideration, the Australian Government has done more than most other countries in reducing the risks and potential liabilities arising from commercial space activities. However, this also reflects the influence of the oil and gas industry on the policy priorities of the Australian Government.[115] While this may be seen as an additional and unnecessary regulatory burden, it can also be considered a positive step in the active reduction of the safety risk of space launches and a move that will increase public and international confidence in the Australian launch industry.

FINANCIAL AND INSURANCE REQUIREMENTS

The Act requires a launch operator to demonstrate its compliance with the insurance and financial responsibility requirements through an approved Insurance Compliance Plan.[116] These requirements are provided for in Division 7 of Part 3 of the Act. The Act requires the launch operator to hold insurance policies to cover against any liability the Government and the launch operator may have under the Act to pay compensation to third parties.[117] It is possible for the launch operator to demonstrate that it has sufficient assets to pay any third party compensation claim instead of having to rely on insurance, but this is unlikely to occur, due to the large amount of damage generally required.[118]

The amount of the insurance cover required is either A$750 million, as indexed from time to time, or the amount of the maximum probable loss as determined by the Government.[119] The "**maximum probable loss**" (the "**MPL**") for a launch is determined by the application of the methodology contained in the Maximum Probable Loss Methodology, a document separate to the Act and the Regulations as provided by SLASO.[120] The MPL calculation must be done by an independent person suitably experienced and qualified and is divided into third party casualty losses, third party property losses, environmental damage and economic loss.[121] A separate MPL calculation is required for the downrange flight portion of the launch from that of the

[114] *Ibid*., pp. 8-9.
[115] The Australian Petroleum Production and Exploration Association has been active in advocating increased protection for platforms and other high-value oil and gas facilities in the regulatory framework for launch services: see House of Representatives, Official Hansard of Parliamentary Debates (6 August 2001), p. 29193; and Senate Economics Legislation Committee, REPORT ON THE SPACE ACTIVITIES AMENDMENT BILL 2002 (August 2002).
[116] Regulation 3.04(4)(k).
[117] Section 48(1).
[118] Regulation 7.01.
[119] Section 48(3).
[120] Space Licensing and Safety Office, MAXIMUM PROBABLE LOSS METHODOLOGY (2nd ed., 2002).
[121] Regulation 7.02(2).

launch itself, so that the total applicable MPL for a launch is the combined MPLs for the launch component and the downrange flight component.

In general terms, the MPL is the amount of loss that may result from a given launch that results from failure events that have a higher chance of occurring than the Probability Threshold. The "**Probability Threshold**" is a measure to distinguish between likely and unlikely events and their corresponding losses, using the event probabilities derived from the hazard risk analysis of the Flight Safety Plan. The Probability Threshold in Australia is 1×10^{-7}, or one in ten million, which is comparable to that of the United States.[122] Given the Probability Threshold, the largest and most costly accident within that threshold and an impact area (the "**Casualty Area**") that contains all the possible debris impact points within the Probability Threshold are chosen for the purposes of a governmental determination of the MPL amount. In other words, the loss of a property that has a risk of less than one in ten million will not be taken into account when determining the MPL of a particular launch and any associated return.

Table 2. Methodology for Calculating Maximum Probable Loss[123]

CATEGORY	METHODOLOGY
Third party casualty losses	A value of A$5,000,000 is attributed to each casualty that is likely to occur in the Casualty Area, as determined by multiplying the Casualty Area with its population density.
Third party property losses	This can be determined by either: • 50% of the third party casualty loss estimate; or • where the Flight Safety Plan identified a single high-value property within the Probability Threshold area (such as an oil platform), a specific analysis of the property damage to that property is required.
Environmental damage	This is determined by the higher result of two calculations: • A$100,000; or • if there is a particular high-value property in the impact area, the accurate cost associated with restoring the environment.
Economic loss	This is determined by the higher result of two calculations: • by multiplying the number of estimated third party casualties with the gross domestic product per capita; or • by the sum of the loss-of-use estimates of high value assets based on engineering and financial estimates for that facility.

CONDITIONS AND FEES

During the term of a Launch Permit, the launch operator is required to:

a) conduct the launch activities authorised and any associated return without the risk of causing substantial harm to public health, public safety or property;[124]

b) ensure that no nuclear weapon, other weapons of mass destruction or any fissionable material is launched;[125]

[122] Maximum Probable Loss Methodology, *supra* note 120, p. 7.
[123] *Ibid*., pp. 8-11.
[124] Section 29(a).

c) meet all costs associated with any investigations of accidents or incidents involving the launch operator during the "**liability period**", being the period of thirty days from the launch, up to a limit of A$3,000,000, though this potential liability is not taken into account in MPL calculations;[126]

d) provide all relevant information to the Government relating to the date and time of the launch and all information required by Article IV of the Registration Convention and the Flight Safety Code;[127] and

e) ensure continuing compliance with the Program Management Plan, Technology Security Plan, Flight Safety Plan and the Environmental Plan, where applicable, for the launch and any associated return.[128]

The Government has intended for Launch Permits to take significantly less time to approve than a Space Licence, though it is nevertheless likely to take no less than six months to complete the approval process. An application fee of A$40,000 is payable for a single-launch Launch Permit or for the first launch of a Launch Permit for a series of launches, with a fee of A$10,000 for every subsequent launch in the series.[129] For approved scientific or educational organisations, a fee of A$2,000 is applicable for a Launch Permit.[130]

Overseas Launch Certificates

APPLICABILITY

The Act does not make a distinction between overseas launch operators of Australian nationality and Australian payload owners launching overseas, as any "responsible party" for an overseas launch would appear to be required to hold an Overseas Launch Certificate.[131] The Act defines a "**responsible party**" as being an Australian that carries out a launch or owns, in full or in part, the payload launched from overseas.[132] As a result, the requirement of an Overseas Launch Certificate is imposed on both Australian launch operators and satellite operators for satellites launched overseas and, from a regulatory perspective, this is appropriate as Australia would be a launching State for then purposes of the Liability Convention in either case.

It is clearly in the interest of the Australian Government to seek to pass on its liability to the launch operator or the payload owner where Australia is a launching State of an overseas launch. However, such extraterritorial legislation would only have effect in imposing civil or criminal sanctions if the Australian national was within Australian jurisdiction at the time. As a result, while an Australian satellite operator is likely to be

[125] Section 29(b) and (c).
[126] Regulation 3.02(1)(a).
[127] Regulation 3.02(1)(d) and (e).
[128] Regulation 3.02(1).
[129] Section 59 and Regulation 9.02.
[130] Discussion with Dr. Michael Green, Space Licensing and Safety Office, 6 November 2002.
[131] Section 12.
[132] Section 8.

in Australia at the time of the overseas launch, this is unlikely to be the case involving an overseas launch operator of Australian nationality. In the absence of any bilateral agreement between the governments concerned, this affords negligible protection to Australia in the absence of any bilateral or multilateral agreement concerning the licensing and insurance cover for claims made under the Liability Convention.

CRITERIA AND DOCUMENTS FOR GRANTING AN OVERSEAS LAUNCH CERTIFICATE

The following basic criteria apply before an Overseas Launch Certificate would be granted to a responsible party for an overseas launch:

a) the insurance or financial responsibility requirements of the Act has been satisfied;[133]

b) the probability of causing substantial harm to public health and public safety is sufficiently low;[134]

c) there are no reasons arising from the interests of Australia's national security, foreign policy or international obligations that make the grant of an Overseas Launch Certificate undesirable;[135] and

d) the space object being launched does not contain a nuclear weapon or a weapon of mass destruction of any kind.[136]

The Act provides that the Australian Government may take into account any bilateral or multilateral agreement or arrangement under which another State assumes liability and indemnifies the Australian Government.[137] Currently, no such agreement exists between Australia and any other State. It must be noted that the existence of such an agreement or arrangement would not exempt the launch operator or Australian payload owner from the need to obtain an Overseas Launch Certificate from the Australian Government.

In applying for an Overseas Launch Certificate, the following documents must be provided to the SLASO:

a) information concerning safety requirements imposed by the government of the country where the launch is intended to take place;[138]

b) if there are no safety requirements or, if they are inadequate in the opinion of the Australian Government, all information available to the public about the track record of the launch facility and the launch vehicle of the preceding five years;[139]

c) details of the organisational structure of the responsible party and any contractual arrangements directly connected to the launch;[140]

[133] Section 35(2)(a).
[134] Section 35(2)(b).
[135] Section 35(2)(c).
[136] Regulation 4.01(2).
[137] Section 35(3).
[138] Regulation 4.03(1)(j).
[139] Regulation 4.03(4)(a).

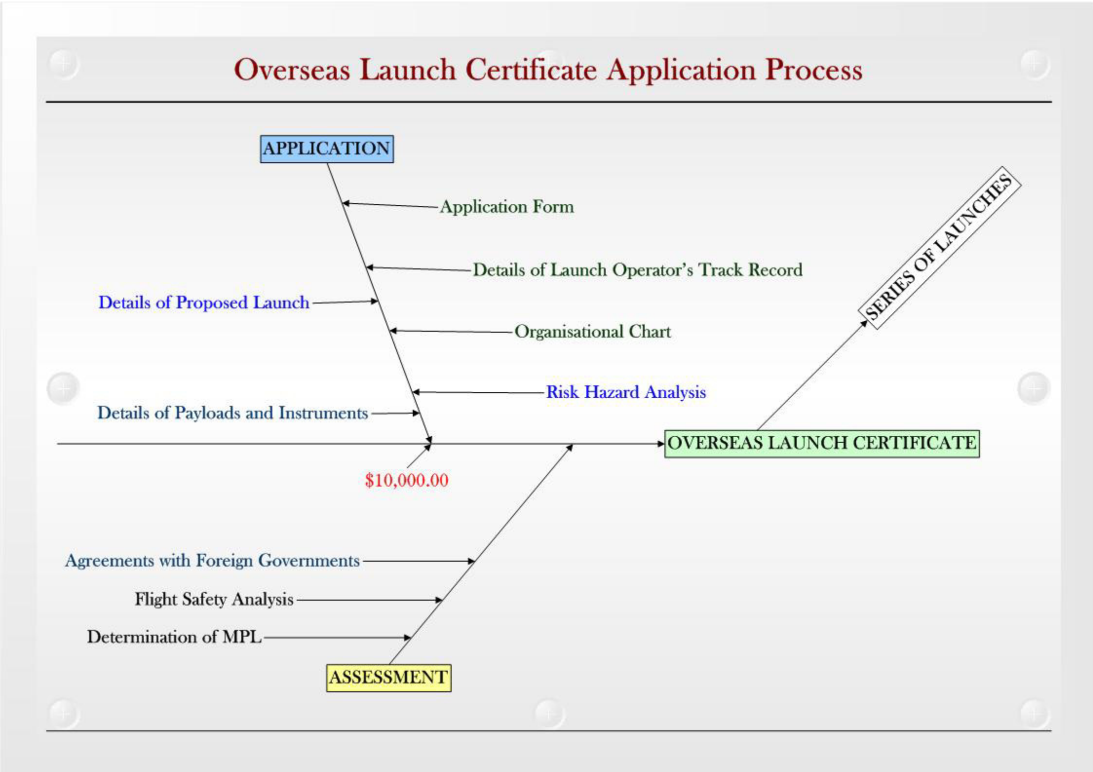
d) evidence that the launch is unlikely to cause substantial harm to public health or public safety;[141]

e) any information required by Article IV of the Registration Convention as well as the proposed orbits and trajectories;[142]

f) the date and time of the proposed launch;[143] and

g) a declaration that the space object does not contain a nuclear weapon or any other weapon of mass destruction.[144]

Figure 5. Overseas Launch Certificate Application Process



Furthermore, as with the application for a Space Licence or a Launch Permit, a responsible party is required to provide documents concerning the chain of command and the duties, responsibilities, names, qualifications and experience of each person in the chain.[145] However, the Regulations does not require a full risk hazard analysis for Overseas Launch Certificates to avoid unnecessary duplication of regulatory processes in other States for launch operators.

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[140] Regulation 4.03(4)(b) and (c).
[141] Regulation 4.03(4)(d).
[142] Regulation 4.03(g)-(i).
[143] Regulation 4.03(4)(d).
[144] Regulation 4.03(4)(e).
[145] Regulation 4.07.

FINANCIAL RESPONSIBILITY AND FEES

An application for an Overseas Launch Certificate has to satisfy the insurance or financial responsibility requirements of the Act in order to provide financial protection to the Australian Government. The Act requires the responsible party to have insurance sufficient to cover the Australian Government against any liability under the Liability Convention or any other provision of international law.[146]

As with a Launch Permit, the amount of the insurance cover required is either A$750 million or the maximum probable loss of the launch as determined by the Australian Government, whichever is lower.[147] The maximum probable loss for an overseas launch is either the amount as determined in the case of an Australian launch under a Launch Permit or the amount assessed by an insurance analyst jointly appointed by the Australian Government and the responsible party to be the amount of liability to pay compensation that the Government may incur as a result of the launch.[148]

The fee payable for an Overseas Launch Certificate application is A$10,000.[149] A lower fee of A$2,000 is proposed for approved scientific and educational organisations, presumably to be implemented by future amendments to the Regulations.[150] It is assumed that the costs in relation to the assessment of the maximum probable loss amount will be borne equally by the Government and the responsible party, though it may also be considered as part of the application fee.

Authorisations of Return

The Act provides that an Authorisation of Return is required when an overseas-launched space object is returned to Australia.[151] It must be noted that the Australian Government is not liable internationally for any loss or damage suffered as a result of a return destined for Australia as Australia would not be regarded as a launching State.[152] The requirement of an Authorisation of Return is thus clearly intended to protect potential Australian nationals from injury, loss or damage from the return. In the case of an Australian-launched space object being returned to Australia, the return segment is simply authorised and regulated as a part of the Launch Permit.[153]

The Authorisation of Return is really not a licence or permit at all, as it can amount to no more than a letter from the relevant Government Minister authorising the return or as part of an agreement between the responsible party or its national government and the Australian Government.[154] The Government must be satisfied of the following criteria before a return to Australia will be authorised:

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[146] Section 48(2).
[147] Section 48(3).
[148] Regulations 7.02 and 7.03(1).
[149] Regulation 9.03.
[150] Discussion with Dr. Michael Green, Space Licensing and Safety Office, 6 November 2002.
[151] Section 14.
[152] Liability Convention, Article I.
[153] Section 13.
[154] Section 43(1) and (2).

a) demonstrated competence of the applicant to carry out the return;[155]

b) compliance with the insurance or financial responsibility requirements;[156]

c) the probability of causing substantial harm to public health or public safety is as low as reasonably practicable;[157]

d) there are no reasons arising from Australia's national security, foreign policy and international obligations make the grant of the Authorisation of Return undesirable;[158] and

e) all necessary environmental approvals are met and that an Environmental Plan for the return is in place, either pursuant to another Australian law or otherwise.[159]

In satisfying the insurance or financial responsibility requirements of an Authorisation of Return, the Act imposes the same requirements on Authorisations of Return as those for Launch Permits. Surprisingly, for what presumably is an omission, the Regulations do not provide for an application fee to be payable, though this is likely to be rectified in the near future. It was suggested during earlier public consultations that the appropriate application fees are A$15,000 for a commercial return and A$2,000 for one conducted by an approved scientific or educational organisation.[160]

Exemption Certificates

When the Act was originally enacted, there was no indication as to the circumstances that would justify the issue of an Exemption Certificate by the Government, which allows the holder to carry out space activities that would normally require a Space Licence, a Launch Permit, an Overseas Launch Certificate or an Authorisation of Return. It was generally believed throughout the Australian space sector that the Exemption Certificate was intended for governmental, educational or scientific space activities, especially as the Act refers only to ascertaining the national interest and national benefit in considering an application. The parliamentary debates also provide little assistance on this subject.[161]

It was not until the enactment of the Regulations in 2001 when it became clear that an Exemption Certificate is intended for emergency launches and that approved scientific or educational organisations are subject simply to lower licence fees.[162]

The considerations for granting an Exemption Certificate are:

a) demonstrated emergency need for the space activity to take place;

[155] Section 43(3)(a).
[156] Section 43(3)(b).
[157] Section 43(3)(c).
[158] Section 43(3)(e).
[159] Regulation 5.01.
[160] Discussion with Dr. Michael Green, Space Licensing and Safety Office, 6 November 2002.
[161] Section 46(2).
[162] Regulation 6.01.

b) the positive national benefits or the national interests served by the activity;[163]

c) the likely risk of substantial harm to public health or public safety being minimal; and

d) the likely exposure of the Australian Government to liability under the Liability Convention and other provisions of international law.[164]

The Regulations provide that the fee for an Exemption Certificate is A$10,000.[165] It is proposed that a fee of A$2,000 is to be introduced for Exemption Certificates applied for by approved scientific or educational organisations.[166]

LAUNCH SAFETY AND INVESTIGATIONS

Launch Safety Officer

The Australian Government is required by the Act to appoint a Launch Safety Officer for each launch facility licensed under a Space Licence.[167] The Launch Safety Officer has the responsibility of ensuring that the Act and the Regulations are complied with and that no person or property is endangered by a launch that takes place at the facility.[168]

The Launch Safety Officer has the following powers:

a) to enter and inspect the launch facility and any space object, including the inspection and testing of any equipment, with the consent of the holder of the Space Licence;[169]

b) to request for the provision of any information or assistance from the launch operator that is relevant to safety or the launch operator's compliance with the conditions of the Space Licence or the Launch Permit;[170]

c) to carry out any direction lawfully given by the relevant Government Minister concerning the launch facility or the launch;[171]

d) to give directions concerning the launch and any associated return of a space object to be carried out at the launch facility that are necessary to avoid any danger to public health, with which the launch operator must record and report the steps taken accordingly;[172]

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163 Section 46(2).
164 *Ibid*.
165 Regulation 9.05.
166 Discussion with Dr. Michael Green, Space Licensing and Safety Office, 6 November 2002.
167 Section 50.
168 Section 51.
169 Section 52(2)(a).
170 Section 52(2)(b).
171 Section 55.
172 Section 52(2)(c) and (d) and Regulation 8.03.

e) give directions requiring the launch or return to be aborted or the space object to be destroyed at any time where necessary, with which the Space Licence holder must record and report the steps taken accordingly;[173] and

f) where the seriousness and urgency of the circumstances necessitate a search of the launch facility to locate a thing relating to a possible offence under the Act that may be lost, concealed or destroyed, to undertake such a search and, if found, seize the thing.[174]

Table 3. Persons to be notified by the Launch Safety Officer

JURISDICTION	LAUNCH FACILITY	FACILITY & OVERFLIGHT
Commonwealth	Secretaries of the Departments of the Prime Minister and Cabinet, the Attorney General, Foreign Affairs and Trade, Defence and Transport and Regional Services.	
	Director, Civil Aviation Safety Authority	
	Director-General, Emergency Management Australia	
	Aeronautical Information Service Manager, Airservices Australia	
Foreign	Director, North American Aerospace Defence Command, United States Space Command	
New South Wales	Director-General, Premier's Department	Chair, State Emergency Management Committee and State Emergency Operations Controller
Victoria	Secretary, Department of Premier and Cabinet	Director of the Office of the Emergency Services Commissioner
Queensland	Director-General, Department of the Premier and Cabinet	Director-General, Department of State Development
Western Australia	Director-General, Ministry of the Premier and Cabinet	Chief Executive Officer, Fire and Emergency Services Authority
South Australia	Chief Executive, Department of the Premier and Cabinet	Director, State Emergency Services
Tasmania	Secretary, Department of Premier and Cabinet	Director, State Emergency Service
Australian Capital Territory	Chief Executive, Chief Minister's Department	Executive Director, Emergency Management of the ACT
Northern Territory	Secretary, Department of the Chief Minister	Director, Northern Territory Emergency Service
Christmas Island	Administrator, the Territory of Christmas Island Director-General, Ministry of the Premier and Cabinet of Western Australia	Officer-in-Charge, Christmas Island Chief Executive Officer, Fire and Emergency Services Authority of Western Australia
Local Government	The local government authority for the area in which the launch facility is located	

173 *Ibid*.
174 Section 56(1).

The Launch Safety Officer also has the primary responsibility for ensuring that the Australian Government and the public are notified of an imminent launch.[175] However, it is unclear who is in fact responsible for issuing the notice. Such a notice must be given to the prescribed government authorities as listed in Table 3 between two to ten days before the launch, specifying the date and time of the launch.

It appears that the Launch Safety Officer also has the responsibility of ensuring that Airservices Australia is informed for the purposes of airspace clearance, even though Part 101 of the *Civil Aviation Safety Regulations 1998* (Cth) imposes that responsibility on the launch operator itself.[176] If there is any residential community within fifty kilometres of the launch facility, the Launch Safety Officer must also ensure that notifications are given to all local newspapers, radio stations and other community media within the notification period for broadcast.[177] On the day of the launch, the notice must again be broadcast on all local radio stations some hours before the launch.[178]

Investigation of Accidents

The Act provides a régime for investigations of incidents or accidents that took place during the liability period and it is expected that the Australian Transport Safety Bureau would carry out such investigations.[179] It is important to note that the *Transport Safety Investigation Bill 2002* (Cth) (the "**Bill**"), currently proceeding through the Senate, regulates all accident investigations conducted by the ATSB. Although investigations concerning space launches are not specifically referred to in the Bill, it does provide that it prevails over any other federal law, including the *Space Activities Act*, in the case of any inconsistency.[180] As a result, assuming that the Bill does apply to investigations conducted under the Act, it is important for launch operators to consider the provisions contained in both laws.

The term "**liability period**" under the Act means the period of thirty days from the launch or from a relevant re-entry manoeuvre to the time when the space object comes to rest on Earth.[181] It appears from the Act that the Australian Government intends to limit the time for which a launch operator is liable to third parties to the liability period.

Under the Act, an "**accident**" is where a person died or suffered serious injury or if property was destroyed or seriously damaged.[182] An "**incident**" is where an accident nearly occurred or where an event took place that affects or could affect the safety of the present and future operations of the launch operator.[183] The reason why such a distinction is made is because the Government *must* appoint a suitably experienced and qualified Investigator in the case of an accident, whereas it *may* choose not to do so in

[175] Section 51(a) and (aa).
[176] *Civil Aviation Safety Regulations 1998* (Cth), Regulation 101.450.
[177] Regulation 8.01(2).
[178] Regulation 8.01(5).
[179] Section 84.
[180] *Transport Safety Investigation Bill 2002* (Cth), s 10(2).
[181] Section 8.
[182] Section 85.
[183] Section 86.

the case of an incident.[184] This is similar to the régime provided for the investigation of aviation accidents under Part 2A of the *Air Navigation Act 1920* (Cth).

The Investigator appointed under the Act has the following powers:

a) the Investigator may require, by written notice, a person to attend a hearing and answer questions, which may be on oath or affirmation, or to provide any documents, records, components or equipments relevant to the investigation;[185]

b) the Investigator may enter and search the accident site with or without the consent of the owner of the site during the "access period" as specified by the Investigator, which is to be no more than twenty-eight days unless the Government approves otherwise, and take any necessary samples, photographs, video recordings and sketches;[186] and

c) remove the wreckage or any part thereof from the accident site.[187]

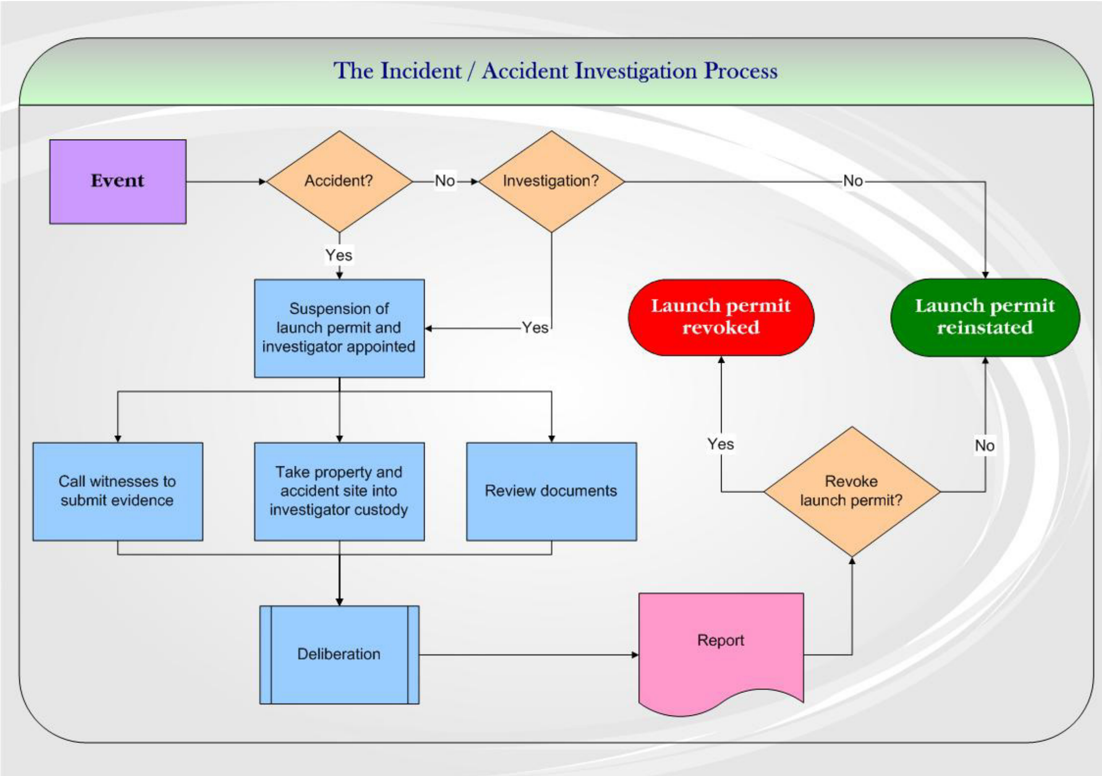
In protecting the interests of the launch operator as well as ensuring that the information obtained by the Investigator will be true and accurate, the answers and anything provided to the Investigator cannot be admitted as evidence against the provider in any legal proceedings.[188] While it is a criminal offence to refuse to answer questions or to refuse to give testimony on oath or affirmation, a person nevertheless retains the privilege against self-incrimination in that a person is not compelled to provide testimony or documents that would incriminate them.[189] As for the wreckage, it is deemed to have been taken into the Investigator's custody until no longer needed for the investigation, even if the Investigator took no steps to move the wreckage.[190]

At the end of the investigation, the Investigator is required to provide a written report of the investigation. The Act provides that this report *may* be published if it is considered to be desirable in the interest of promoting safety in the space industry and this benefit outweighs the potential impact on the interests of the launch operator.[191] However, the Bill provides that the Investigator *must* publish the investigation report, either electronically or in hard copy, and as the Bill prevails over the Act, it may be assumed that there is a compulsory requirement to publish the report.[192] Under the Act, the investigation report is not admissible as evidence in an Australian court except in relation to a coronial inquiry concerning the death of an individual as a result of the accident.[193] Even if the report is published, the statements, communications and medical or personal information collected during the investigation cannot be disclosed, unless

[184] Section 88.
[185] Section 91(1)-(3).
[186] Section 100(1) and the *Transport Safety Investigation Bill*, ss 33-36.
[187] Section 100(1)(k) and the *Transport Safety Investigation Bill*, s 36.
[188] Section 91(5)-(6).
[189] Section 92(1)-(2).
[190] Section 94.
[191] Section 93.
[192] *Transport Safety Investigation Bill*, s 25.
[193] *Ibid.*, s 27.

incorporated as part of the investigation report, except by order of a court and generally only with restricted circulation for the purposes of litigation.[194]

Figure 6. The Accident / Incident Investigation Process



On 30 October 2001, an anomaly occurred during a HyShot rocket launch used to test an experimental supersonic-combustion ramjet (scramjet) engine built by the University of Queensland at Woomera, South Australia. The Government subsequently ordered an investigation pursuant to the Act. The Investigator reported on 18 June 2002 and found that the risk hazard analysis conducted by the University of Queensland did not give sufficient allowance for the rocket vehicle malfunctioning and going off course, especially its potential impact along the Stuart Highway linking Adelaide, South Australia, to Alice Springs and Darwin in the Northern Territory.[195] Although the investigation and the resulting report were highly technical in nature, this has provided the ATSB with a much-needed opportunity to undertake an investigation concerning space activities and acquire some experience in the process.

[194] Section 96.

[195] Neville McMartin, FINAL REPORT OF THE INVESTIGATION INTO THE ANOMALY OF THE HYSHOT ROCKET AT WOOMERA, SOUTH AUSTRALIA ON 30 OCTOBER 2001 (2002), available at the Space Licensing and Safety Office, <http://www.industry.gov.au>, last accessed on 16 September 2002, p. iv. The wreckage was located twenty-eight kilometres east of the Stuart Highway.

REGISTRATION CONVENTION

The Registration Convention requires national governments to establish their own register of space objects as well as submit various required information to the United Nations for inclusion in an international register. Specifically, the information required for notification under the Registration Convention are:

a) name of the launching States;

b) its registration number on the domestic registry;

c) the launch date;

d) location of the launch facility;

e) basic orbital parameters of the space object, including its nodal period, inclination, apogee and perigee; and

f) the general function of the space object.[196]

The Act established a Register of Space Objects, which must include all the information required by Article IV of the Registration Convention as well as the launch facility from which the space object is launched and a registration number provided to the space object by the Australian Government.[197]

It is surprising to note that the Act does not require the Government to pass on any information to the United Nations Register of Space Objects as required by the Registration Convention. However, as Australia has been diligent in providing the required information to the United Nations Register in the past, it is assumed that the Government will continue to do so despite the absence of any statutory requirement.

LIABILITY OF LAUNCH OPERATORS

Scope of Part 4

One of the most important features of the Act is the imposition of liability on the launch operator for damage caused to third parties, regardless of whether the damage was incurred in Australia or elsewhere. The rationale behind this is that the launch operator, and not the Australian Government, should be financially responsible for any liability incurred as a result of the space activities conducted by the launch operator. This is comparable with the régime imposed in the United States, which was clearly the model on which the Australian liability framework was based.

Part 4 of the Act provides for the regulation of third party liability of the launch operator and the amount of compensation payable, provided that the damage was

[196] Registration Convention, Article IV.
[197] Section 76.

suffered during the "liability period" and Australia is a launching State of the space object.[198] The Part applies regardless of whether the loss or damage was suffered in Australia or elsewhere and regardless of whether the launch or return was authorised under the Act.[199] However, it is possible for third party liability to fall outside the scope of Part 4, such as where the liability is caused outside the liability period. The Act is silent on the liability, procedure and the amount of compensation payable in such cases.

If Part 4 applies to a particular third party liability claim, it is important to note that there is more than one avenue through which liability may be prescribed on launch operators or satellite operators. This is particularly so for foreign third parties as the Liability Convention is not the only means by which the third party may seek compensation. These avenues include:

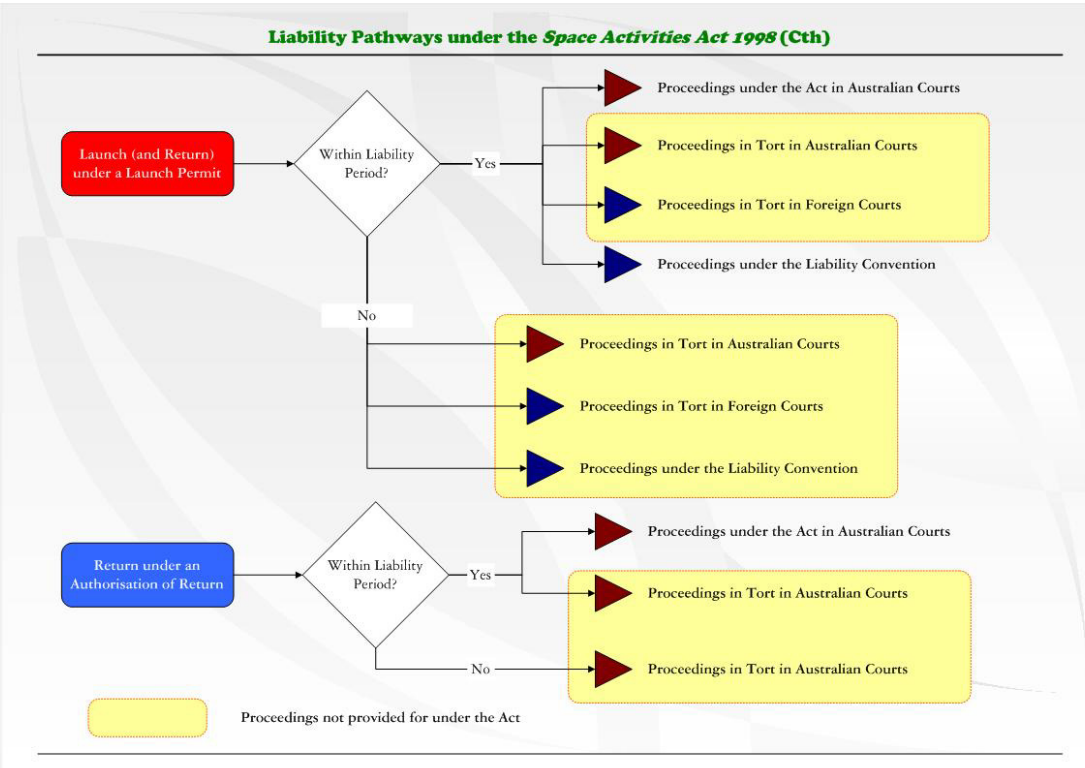
a) Australian third parties taking proceedings in Australian courts with the liability and compensation payable determined in accordance with the Act;

b) foreign third parties taking proceedings in Australian courts with the liability and compensation payable determined in accordance with the Act;

c) Australian third parties taking common law proceedings in Australian courts;

d) foreign third parties taking common law proceedings in Australian courts;

Figure 7. Liability Pathways under the Act



198 Section 63.
199 *Ibid*.

e) foreign third parties taking proceedings in foreign courts in tort; and

f) action taken by foreign governments under the Liability Convention.

These options will now be considered in turn.

Proceedings under the Act

The Act imposes an absolute liability régime on launch operators in that they are liable to pay compensation on any damage caused to a third party on Earth and to aircraft in flight during the "liability period", except where the loss or damage was caused with the intent or gross negligence of the third party.[200] However, if the damage is caused to another space object in space, the launch operator is liable only to the extent that it was the fault of the launch operator.[201] This liability régime reflects the position contained in Articles II and III of the Liability Convention and effectively implements the international principles of liability for space activities into Australian domestic law.

Provided that there was no breach of any of the conditions on the Space Licence or Launch Permit, the liability of the launch operator in proceedings brought under the Act is limited to the insured amount as required by the Act, which is either the MPL amount or the statutory ceiling of A$750 million.[202] In other words, a claim brought by a third party against a launch operator under the Act must be less than the amount of the insurance cover provided to the launch operators or the claim is limited in its recovery to the insurance amount. While there are other options for foreign third parties, the ability of an Australian third party to recover more than the insurance cover would depend on the possibility of tort claims, as discussed below.

The Act provides for proceedings for compensation under the Act to be brought in the Federal Court of Australia within one year from the day the damage occurred or the day the plaintiff became aware of the damage or would have become aware of the damage if due diligence was exercised.[203] In the case of a foreign third party bringing proceedings in Australia pursuant to the Act, the third party is not allowed to "double-dip" if proceedings brought under the Liability Convention or otherwise in accordance with international law has already been presented to the Australian Government.[204]

Tort Claims

<u>OVERVIEW</u>

One issue of particular interest to Australian space lawyers, from an international and constitutional point of view, is whether the Act is capable of being an exclusive code concerning liability arising from launch activities. From established legal principles, it appears that the Act cannot apply extraterritorially to the extent that it requires a foreign

[200] Section 67.
[201] Section 68.
[202] Section 69(3) and 48(3).
[203] Sections 72 and 73(1).
[204] Section 73(2).

plaintiff to take proceedings only in Australia and only under the Act and, as a result, the possibility of legal actions in foreign courts remains a source of liability for Australian launch operators. On the other hand, if a foreign third party chooses to sue in Australia, then the third party is likely to be bound by any Australian law limiting the liability of a launch operator or satellite operator. In other words, if the Act can validly abolish tort actions by third parties in Australia, the abolition or limitation would apply equally to both Australian and foreign third parties suing in Australia, though it is likely to have no effect on limiting the rights of foreign third parties suing in foreign courts.

It is unclear, however, whether the Act in fact abolishes common law claims based on tort law in Australia. The Australian Government has signalled an intention that the Act was intended to abolish all other third party liability in Australia, especially tort liability, for launch operators.[205] However, there are reasons why an Australian court may not give such effect. These reasons are:

a) the Parliament may not have the legislative power to abolish such common law claims under the Constitution;[206]

b) the Act does not expressly specify that it intends to substitute or abolish the tort liability of launch operators;

c) the Parliament may be considered to have done no more than to limit the amount of compensation payable rather than to abolish tort claims altogether; and

d) Section 69(4) of the Act lends further support to the view that the legislative intention was not to exclude tort claims.

CONSTITUTIONAL CONSIDERATIONS

The Parliament indicated that the Act was enacted pursuant to the legislative powers provided by the Constitution concerning external affairs, trading and financial corporations, international and interstate trade and commerce, federal territories and land acquired by the Federal Government for public purposes.[207] The provision of a domestic liability régime appears to go beyond what the space treaties provide for, though the launch of a space object is a matter of international concern and has an external dimension to Australia. As a result, it is unclear whether the regulation of domestic liability is within the external affairs power of the Parliament, though this exercise of legislative power is untested in the High Court of Australia.[208]

[205] Section 64.
[206] Similar to the constitutions of some federal countries, s 51 of the Australian Constitution sets out the areas on which the Federal Parliament can legislate, two of which are corporations and external affairs.
[207] Section 108.
[208] One exception to this would be test flights as they cannot be regarded as concerning external affairs nor are they confined to the territories, federal land or relate to interstate trade or commerce. It appears in any event that the Act does not cover test flights under the liability régime provided under Part 4.

LEGISLATIVE INTENTION

In any event, it is questionable that the Parliament did intend to abolish domestic tort claims. This is because the Act lacks the clear terms that exist in other laws concerning the abolition of common law claims. The prevailing view is that, if the Parliament intended to remove a fundamental cause of action concerning a specific matter it should clearly and expressly does so, but instead the Act makes no reference to any other civil liability for launch operators or their abolition under Part 4 of the Act.[209] The *Civil Aviation (Carriers' Liability) Act 1959* (Cth), for example, provides in clear terms that the liability under the relevant international convention "is in substitution for any civil liability of the carrier under any other law in respect of the injury".[210]

LIMITATION ON COMPENSATION PAYABLE

Section 64 of the Act provides that "*Compensation* for damage to which this Part applies caused to third parties is only *payable* in accordance with this Part".[211] As the provision refers to "compensation" being "payable" rather than "claims" being "determined" or other terms of similar effect, it is arguable that the provision in the Act does no more than to limit the liability of launch operators, regardless of how the action is brought, rather than to abolish common law actions altogether. During the parliamentary debates in the House of Representatives concerning the *Space Activities Amendment Act 2002*, it was stated that the Government had intended to place a cap on the liabilities of launch operators as an alternative approach to the exclusion of all common law rights altogether.[212] This statement was made by a parliamentarian sitting on the Government benches and, furthermore, was not contradicted by the relevant Minister or his Parliamentary Secretary at the time.

This may well be the preferred view that may be adopted by the courts in the event of a future claim. If the Parliament intended no more than to limit the compensation payable, an interpretation clearly open from the terms of the provisions, then the launch operator may be subject to claims brought both under the Act and in tort. In practice, however, a third party is unlikely to pursue the tort option as it requires the third party to prove negligence on the part of the launch operator while the compensation payable will be limited in both cases by the provisions of the Act.[213]

SECTION 69(4)

Section 69(4) of the Act is also curious in wording, if indeed the Parliament intended to abolish domestic tort claims rather than to merely limit the amount of compensation payable. Section 69(4) provides that:

> (4) If:

[209] Section 64.
[210] *Civil Aviation (Carriers' Liability) Act 1959* (Cth), s 13.
[211] Section 64(1), italics added.
[212] House of Representatives, Official Hansard of Parliamentary Debates (16 May 2002), p. 2349.
[213] Section 69(3).

(a) the responsible party has paid compensation for the damage of an amount equal to the insured amount for the launch permit or overseas launch certificate; and

(b) *apart from this section*, the responsible party would be liable to pay further compensation to Australian nationals for the damage of an amount (the ***excess amount***) in excess of the insured amount for the launch permit or overseas launch certificate;

then the Commonwealth is liable to pay compensation to the Australian nationals for the damage of an amount equal to so much of the excess amount as does not exceed $3 billion.[214]

If Part 4 of the Act is intended by the Federal Parliament to be an exclusive régime concerning liability, it would appear that Section 69(4) would have no operation, as there would not be any compensation payable to Australian nationals "apart from this section". However, if Part 4 merely limits the amount of compensation payable, then it is reasonable to assume that a Court may find a launch operator to be *liable* for an amount in excess of its insurance cover. In such a case, s 69(4) will have operation as the launch operator is only required to pay an amount equalling its insurance cover, with any excess amount up to A$3 billion to be payable by the Government if the third party is an Australian national. If the third party is a foreigner, their recovery in Australian courts will be limited to the insurance cover of the launch operator.

In sum, therefore, there appears to be some support for the view that common law actions in tort may be brought against Australian launch operators. However, unless the limitation of one year has expired before the third party began proceedings or if the damages claimed exceed the insurance cover of the launch operator, there appears to be little financial benefit to be gained for a third party to bring a claim in tort rather than pursuant to the Act. This is especially so as the third party will be required to establish the requirements of a negligence action in tort, whereas absolute liability is prescribed in actions proceeding under the Act.

Compensation for Domestic Claims

On a practical level, the Act effectively limits the compensation payable by launch operators but not to abolish the liability itself. As it is possible for a launch operator to be found liable for an amount exceeding the insured amount, the launch operator is only required to pay compensation equalling the insured amount. While this would be the end of the process for an action brought under the Act, this is not the case if an Australian third party brings an action in tort. This is because Section 69(4) will then have application as the Government will compensate an Australian third party up to an amount of A$3 billion in excess of the insured amount. If the excess liability exceeds A$3 billion, no further compensation is payable as the Act effectively exonerates the launch operator or the Government from being required to pay any further compensation to an Australian third party. The reason why the Government indemnity is not available in actions brought under the Act is because the liability would not have arisen "apart from this Section", being Section 69 of the Act.

[214] Italics added.

Where a foreign third party brings a tort claim in Australia or overseas, the governmental contribution provided under the Act is not available as it applies only to liability of the launch operator to Australian nationals.[215] Consequently, in the case of a claim brought overseas, the launch operator is liable for the entire amount awarded to the foreign third party, subject to its ability to call on its insurance cover for at least part, if not all, of the compensation awarded. If the foreign third party brings proceedings in Australia, however, the Act will have application to limit the launch operator's liability and the total compensation that may be received by the third party to the insured amount, regardless of whether the action was framed in tort or pursuant to the Act. As a result, it may be more beneficial for a foreign third party to bring proceedings in its domestic courts concerning large claims, if possible, to maximise the compensation payable.

Claims under the Liability Convention

The Liability Convention provides that a State may bring a claim against Australia where the State or one of its nationals has suffered injury, loss or damage caused by a space object for which Australia is a launching State.[216] The Liability Convention also provides for a claim to be negotiated through diplomatic channels between the governments and, in the event that negotiations fail to resolve the claim, a Claims Commission is to be established to determine the claim.[217] While the Liability Convention does not require the exhaustion of local remedies before bringing a claim, it does prevent a claim to be brought when domestic proceedings have already begun.[218] In other words, a foreign third party may take action privately in domestic courts or to promote its government to take up its claim through the Liability Convention, but not both.

The Act provides that the launch operator is liable to reimburse the Australian Government for the full amount of the compensation or the insurance amount, whichever is lower, provided that the launch was authorised and fully compliant with the conditions of the relevant Space Licence and Launch Permit.[219] As liability under the Liability Convention is imposed on the Australian Government, this effectively means that the Government would pay any amount in excess of the insurance amount claimed by the foreign government.

Liability Outside the Scope of Part 4

The liability concerning any damage arising outside the liability period is very different to that for damage incurred within the liability period. Essentially, the Act is silent on the liability arising outside the liability period, leaving the common law or international law to determine the liability and the compensation payable of the launch operator, the payload owner or the Australian Government.

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[215] *Ibid*.
[216] Liability Convention, Article VIII.
[217] *Ibid*., Article IX.
[218] *Ibid*., Article XI(2).
[219] Section 74(2).

The term "**liability period**" means the period of thirty days from the launch or from a relevant re-entry manoeuvre to the time when the space object comes to rest on Earth.[220] With this in mind, it appears that there are several scenarios for damage to be caused outside this liability period, including (but not limited to):

a) damage caused by remnants of the launch vehicle over thirty days after its launch, such as the re-entry of a third stage rocket colliding with an aircraft in flight; or

b) damage caused by the payload over thirty days after its launch, such as a collision with another satellite.

Where an Australian third party suffers the damage, that third party will have recourse against either the launch operator or the payload owner in common law. The procedures and limitations imposed under the Act will have no application on such claims as Part 4 is confined in its scope to liability caused within the liability period.[221] The choice of the appropriate defendant in such a claim may depend on several factors, the most important of which would be the degree of fault or negligence. Other factors would likely include the insurance cover, financial support, fault or negligence and the location of the launch operator or payload owner.

If a foreign third party suffers the damage outside the liability period, Australia will be liable as a launching State for the purposes of the Liability Convention.[222] The foreign third party would have several options:

a) the third party may choose to sue in Australian domestic courts against the launch operator, in which case the claim will be determined in accordance with common law principles of tort and the damages that may be payable would be unlimited;

b) the third party may choose to sue in foreign courts against the Australian launch operator, subject to various jurisdiction and enforcement issues, and the claim will be determined in accordance with the local principles of tort and the damages that may be payable would again be unlimited; or

c) the national government of the third party may choose to pursue a claim against the Australian Government in accordance with the Liability Convention, in which case the Australian Government, and not the private operator, would be liable in accordance with Articles II and III of the Liability Convention. It is unclear whether the Australian Government will have recourse against the launch operator in such case, though it is unlikely in the absence of any legislative provision to permit it.

While the concept of the liability period was designed to limit the liability exposure of Australian launch operators, it appears somewhat strange that the Act would fail to provide any protection to the launch operator in the case of liability falling outside the liability period. As it currently stands, a prudent launch operator would ensure that its insurance cover extends for a period sufficiently long for the third or fourth stages of the

[220] Section 8.
[221] Section 63.
[222] Liability Convention, Article I.

launch vehicle to pose no threat to any third party. Consequently, without legislative change to provide for some form of governmental indemnity, this effectively negates any financial or competitive advantage an Australian launch operator may have vis-à-vis foreign launch operators.

Liability for Returns

The Act defines the "liability period" of a return, regardless of whether it is authorised under a Launch Permit or an Authorisation of Return, as being the period from the manoeuvre initiating the re-entry to the moment when the space object is stationary on the surface of the Earth.[223] In the case of an Australian launch and return, the launch operator would effectively be liable for two liability periods: that of the launch and the return. While this is appropriate in the case of reusable launch vehicles, this is clearly unfair in the case of a returning payload, where the return may take place years after the launch and be completely outside the control of the launch operator. It is expected that the launch industry will eventually succeed in persuading the Australian Government to amend the Act in order to distinguish between the two types of returns.

The Act provides that the liability for damage caused by the return of an Australian space object, regardless of whether it is the launch vehicle or the payload, would be subject to the same liability framework as an Australian launch if an appropriate Launch Permit covers the return.[224] In other words, where a Launch Permit covers both the launch and return of a space object, the liability of the launch operator is determined in the same fashion as a launch-only operation.

In the case of an Australian return of a space object launched overseas as provided for under an Authorisation of Return, Australia would not be regarded as a launching State for the purposes of the Liability Convention.[225] Further, it is also highly unlikely that any person other than an Australian would suffer loss or damage resulting from a return to Australia. Consequently, the Act requires the responsible party to be liable to an Australian third party on an unlimited basis.[226] Alternatively, the Government may take on the claim on behalf of the third party and pursue the launching States under the Liability Convention. Where liability is suffered by foreigners, such as damage to an aircraft in flight during the return, the Act is silent on the issue as presumably it would be one to be resolved without any involvement of the Australian Government.

Where the liability for a return is caused outside the liability period, such as injury or damage caused by the space object exploding after it came to rest on the surface of the Earth, the Act is silent in its provisions. The third party would be able to seek remedies against the launch operator or the responsible party in tort law, or the relevant government may bring a claim under the Liability Convention.

[223] Section 8.
[224] Section 66.
[225] Section 70.
[226] Section 71.

Figure 8. Summary of Liability Issues under the Space Activities Act

Summary of Liability under Part 4 of the *Space Activities Act 1998*

Claim Category	Court	Process	Compensation
Australian claim made pursuant to the Act	Australian Court	Strict liability except in the case of gross negligence on the part of the third party	No excess liability Insurance (MPL or A$750m)
Claim by Australian third party in tort law	Australian Court	In accordance with tort and negligence law principles	No excess liability Government (A$3 billion) Insurance (MPL or A$750m)
Claim by foreign third party in tort law	Australian Court	In accordance with tort and negligence law principles	No excess liability Insurance (MPL or A$750m)
Claim by foreign third party in tort law	Foreign Courts	In accordance with tort and negligence law principles in the country of the Court	Launch Operator Insurance (MPL or A$750m)
Claim brought by foreign government on behalf of foreign third party	Liability Convention	Negotiated settlement Liability determined by a Claims Commission on absolute liability basis	Government Insurance (MPL or A$750m)

CONCLUDING OBSERVATIONS

In the three years since the enactment of the Act, the Australian Government has managed to create and implement a comprehensive and detailed regulatory and launch safety framework for Australian launch operators. There are, however, several areas in the régime where there is room for improvements to take place in the future.

Statutory ceiling on insurance cover. Some concerns remain within the Australian launch industry relating to the statutory ceiling on the insurance cover for launch operators as required under the Act. The Senate Economics Legislation Committee noted recently that the statutory ceiling on the insurance cover provided under the Act exceeds the ceilings imposed in other States (except for the Russian Federation in some cases and the United States), especially considering the Australian requirement to have a flight path that avoids any high-value Designated Assets or Protected Assets.[227] On the other hand, the Australian Petroleum Production and Exploration Association (the "**APPEA**") argued that the potential high costs associated with any damage caused by space launches meant that the insurance cap artificially lowers the risk borne by launch operators, as liability under the Act is capped at the corresponding insurance cover.[228] It does appear, however, that this ceiling is unlikely to change except for the purpose of indexation, as the launch industry is unlikely to accept a higher exposure to liability than it does presently under the Act.

Returns of launch vehicles and space objects. The Act has gone further than the legislative framework of any other State in regulating the return of space objects. However, the Act appears only to be concerned with the return of an Australian reusable launch vehicle, as regulated through a Launch Permit, or the return of a foreign-launched space object, regardless of whether it is the launch vehicle or the payload. In other words, the Act either does not distinguish between the return of an Australian launch vehicle and that of an Australian payload or it does not provide for the return of an Australian-launched space object at all. As a result, the Act potentially produces the unfair and impractical result of requiring the launch operator to be administratively and legally responsible for any return of space objects, even when the return of the payload may be years after the launch took place and beyond the control of the launch operator. Alternatively, the Act may in fact be prohibiting the return of space objects other than that of a reusable launch vehicle, except by means of an Exemption Certificate.[229]

Common law actions by third parties. Confusion remains over the effect of the Act on potential common law tort claims brought by Australian and foreign third parties in Australia. One of the current Australian launch operators suggested to the Senate Economics Legislation Committee that the Act leaves open the possibility of tort actions in common law.[230] The Government's response was that the liability limitation provided in the Act means that immunity is available to launch operators for liability in

[227] Senate Economics Legislation Committee, *supra* note 115, para. 1.18. It was noted that the insurance ceilings imposed by other States are: US$100 million for China, US$53 million for France, US$200 million for Japan and US$500 million for Russia and the United States.
[228] *Ibid*., para. 1.21.
[229] Section 13.
[230] Senate Economics Legislation Committee, *supra* note 115, para. 1.32.

excess of the insurance cover.[231] The Government appears not to appreciate the fact that a foreign third party may bring claims in foreign domestic courts instead of the Liability Convention and the Act does not provide for any protection, such as an indemnity, to the launch operator in such cases. Further, the possibility of common law claims also allow a third party to begin proceedings outside the time period of one year provided under the Act, provided that the action is brought within any time limit imposed by an applicable statute of time limitations.

Governmental indemnity for common law claims. In common law actions brought by Australian nationals, the governmental contribution of A$3 billion in respect of claims brought in excess of the insurance cover is widely considered to be too low.[232] In the submissions made to the Senate Economics Legislation Committee, this view is shared by the launch industry as well as the APPEA. This is particularly the case considering this contribution is not provided in claims brought by foreign third parties or a claim brought pursuant to the Act rather than in common law.

It has also been noted that the Government's contribution of A$3 billion to any common law liability of the launch operator does not specify whether or not the indemnity relates to any one incident and whether or not the Government is exposed to an indemnity in a case where there are multiple third party claimants.[233] As this has the potential of seriously affecting the potential liability of launch operators, this is an issue that should be clarified in any future amendments to the Act.

Claims outside the liability period. The Act does not provide any protection for launch operators in the event of damage caused outside the "liability period", as defined in the Act, for a launch. If the governmental intention of reducing and limiting the liability of launch operators is to be given effect, the Act should either provide for a blanket indemnity for damage caused outside the liability period, regardless of how or where the proceedings are brought, or to effectively and validly abolish any tort actions relating to such damage caused outside the liability period.

Indemnity for foreign private claims. Given that the Act is unlikely to be able to prevent foreign private claims made against the launch operator, the Act does not address this issue nor does it protect the launch operator with any financial indemnity. It appears that the Government may not have considered this possibility and assumed that all foreign claims would be made through the Liability Convention. In order to be consistent in protecting the potential liability of the launch industry, the Act should extend the governmental indemnity in the case of private claims for both Australian and foreign third parties, regardless of where the proceedings are brought. The simplest solution may well be to extend the indemnity provided under Section 69(4) to foreign nationals and foreign claims, as a foreign private proceeding would be a liability arising "apart from this section", being Section 69 of the Act.

***Effect of the Transport Safety Investigation Bill 2002* (Cth)**. It is unclear whether the Bill is in fact intended by Parliament to prevail over the Act in relation to investigations

[231] *Ibid*., para. 1.33, referring to s 69(3).
[232] *Ibid*.
[233] House of Representatives, Official Hansard of Parliamentary Debates (16 May 2002), p. 2350.

concerning space launches.[234] As a result, it may well be necessary for a launch operator or an Investigator appointed under the Act to comply with both laws, a result that can cause more confusion for the launch operator in considering its legal obligations in the event of an incident or accident that requires investigation. The simple solution may be an amendment to the Bill to exclude the *Space Activities Act* from the operation of the Bill, though this would appear to be against the spirit of consolidating the accident investigation legislation concerning the ATSB in one statute.

Responsibility for the costs of accident investigations. It has been asserted continually by the Australian space industry that the requirement for launch operators to pay for the costs of investigations of accidents or incidents effectively gives the Government a "blank cheque" to undertake investigations.[235] This is not reflected in the practice of other countries, especially in the United States, where it is believed that private sector funding for accident investigations would influence the independence and impartiality of the investigations.[236] In any event, the existing Maximum Probable Loss Methodology and the insurance and liability provisions of the Act do not appear to take the investigation costs into account in calculating the insurance cover required, nor does the Act require these costs to be a prescribed item to be covered by the insurance cover of the launch operator.

Reflecting on the objectives of the Act, it is clear that the Australian Government has succeeded in instituting a comprehensive regulatory and launch safety framework for Australian launch activities and there is no doubt that the Act successfully passes on the governmental liability for space activities to the launch operators. There is no doubt that, in the years to come, the Australian Government is likely to continue to improve the framework in order to achieve the aim of facilitating the attraction of foreign investment into the development of a viable commercial launch capacity in Australia.

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[234] *Transport Safety Investigation Bill*, s 10(2).

[235] Regulation 3.02(1)(a). This "blank cheque" now has a limit of A$3,000,000.00, as provided in the recent amendments introduced under the *Space Activities Amendment Regulations (No. 1) 2002* (Cth).

[236] Australian Space Industry Chamber of Commerce, SUBMISSION TO THE DEPARTMENT OF INDUSTRY, SCIENCE AND RESOURCES ON THE EXPOSURE DRAFT OF THE SPACE ACTIVITIES REGULATIONS 2001 (29 March 2001), <http://www.asicc.com.au/publications.htm>, last accessed on 7 October 2002.

Brazilian Launch Licensing and Authorizing Regimes

José Monserrat Filho*

Why and how did Brazil enact legal acts, elaborated and approved by the Brazilian Space Agency (AEB), on license and authorization procedures for private space launching from national territory? What are the main characteristics of these acts? Do they work?

Answering such questions is the purpose of this presentation.

1. Introduction

Firstly, let me inform you that Brazil has two spaceports:

1) Barreira do Inferno Rocket Range (CLFBI), at Natal, capital of the state of Rio Grande do Norte, in the northeast of the country, 5.30º south of the Equator, inaugurated on December 15, 1965, with the launch of a Nike-Apache, a small U.S. Rocket, in a joint operation with the U.S. National Aeronautics and Space Administration (NASA). Thus, the first rocket launched from Brazilian territory was a U.S. one. Barreira do Inferno has already launched approximately 400 sounding rockets. It maintains close co-operation with the European Space Agency as a tracking station for all Ariane launches from Kourou, since the first such launch in 1979.

2) Alcantara Launch Center (CLA), conceived in 1979, opened for operations in 1990, is located in the state of Maranhao in the north of Brazil, in a very privileged area of 620 km², only 2.18º south of the Equator. This location permits launches to the east with great fuel savings, thanks to the considerable contribution of the Earth's rotation in relation to the tangential velocity of the vehicle. It also offers conditions considered excellent for launch to equatorial and polar orbits. This is an advantage, in relation to the majority of the world's existing launch sites or centers, for launch into equatorial Geo-stationary Transfer Orbits. Moreover, the CLA's position in relation to the sea favours launches into all azimuths without the need to fly over inhabited regions. It allows the achievement of the most varied satellite missions. More than 200 sounding rockets have been launched from the CLA. (1)

That's why when we speak about private launches from Brazilian territory, we have actually in mind private launches from the CLA. More than ever it is quite clear that the CLA provides valuable benefits, the most promising space service Brazil can offer to the global economy.

2. Major motivation

– To launch the CLA into the world market.
– To make good use of its advantageous geographical situation.
– To offer competitive launching alternative to foreign private enterprises.
– To attract foreign State and private investments to participate in these profitable activities.

These aims changed the Brazilian space policy (2), especially in the second half of the 1990s. At the same time, the need arose to regulate domestically these kinds of activities. Brazil would have to incorporate into national law the legal principles included in Articles VI, VII and VIII of the 1967 Outer Space Treaty, as well as the dispositions of the 1972 Liability Convention and those of the 1976 Registration Convention. (3)

This means converting into national law the international duties to assume responsibility and liability for space activities (launching) of non-governmental entities in Brazilian territory, as well as registering the objects these entities launch into space.

The first relevant Brazilian legal text was the decree of August 3rd, 1961, signed by the then President of the Republic Janio Quadros, who was an enthusiastic supporter of space activities. This decree created the Organizing Group for the National Commission on Space Activities (GOCNAE), charged to promote Brazil's entrance to this new area. (4)

Forty years later, on June 20th, 2001, Brazil issued its first act regulating private participation in space activities within the State's jurisdiction, international responsibilities and international liabilities. This is Administrative Edict N. 27, approving the "Regulation of procedures and the definition of requirements necessary for request, evaluation, issuance, control and follow-up of licenses for carrying out space launching activities on the Brazilian territory".

Less than a year later, on February 21st, 2002, a second and complementary act with the same focus was issued: Administrative Edict N. 05, approving the "Regulation of procedures for the authorization to carry out space launching operations in the Brazilian territory". (5)

Both Edicts and Regulations were elaborated by the Brazilian Space Agency (AEB) and approved by the High Council of the AEB as well as by the President of the AEB. They entered into force, respectively, on June 21, 2001, and on February 25, 2002, when they were published in the Union's Official Gazette. As they are legally binding, they may be invoked in the courts of justice.

Consequently, it is an obligation for any private entity interested in carrying out launching activities in or from Brazil to obtain first a license for this end, and afterwards an authorization to complete the operation.

License and authorization – these acts provide the basis for governmental control over all private launching activities in Brazil.

3. The shorter way

According to Professor Frans G. von der Dunk, Brazil became the ninth country and the first "developing country" with a proper national legislation specific to the private sector's participation in space activities. The other countries, with the year of enactment of their respective laws, are: Norway (1969), USA (1970), Sweden (1982), the United Kingdom (1986), Russia (1993), South Africa (1993), Ukraine (1996) and Australia (1998). (6)

However, if today Brazil has this unique distinction, it is also due to Law N. 8.854, of February 10th, 1994, which created the AEB (7). Fortunately, the author of this law had the foresight to assign to the AEB the legal competence to issue Administrative Edicts, which are legally binding, on important issues relating to space activities. Thus, according to Article 3, § XIII, of that law, the AEB is competent "to establish rules and issue licenses and authorizations regarding space activities".

It should be underlined that, according to the 1988 Brazilian Constitution (Article 22, § X), the competence to legislate on issues related to space activities belongs exclusively to the Union (Federal Administration and National Congress).

It is worth noting that the same Article 3, at § XII authorizes the AEB "to identify commercial possibilities to utilize space technologies and applications in order to stimulate entrepreneurial initiatives, to render services or to produce goods".

In fact, this large competence gives the AEB the legal basis to lead, to a considerable extent, the plan of commercialization of Alcantara Launching Center (CLA), in which the use of Administrative Edicts can play an important role.

AEB was founded as a federal autarchic, autonomous entity directly linked to the President of the Republic, but this link lasted less than a year. As soon as President Fernando Henrique Cardoso came to power, in 1995, he moved the AEB to the National Secretary of Strategic Affairs (a kind of Ministry). Since 1999, the AEB has been within the Ministry of Science and Technology. All AEB initiatives and decisions are, therefore, supervised and controlled by this Ministry.

It engenders, by the way, a curious administrative framework. The AEB is managed by a President and a High Council, which has 17 members, including representatives of numerous Ministries. This way, insofar as the Ministry of Science and Technology supervises the AEB, it also stands above other Ministries, at least in relation to space matters – which, definitely, is not a usual situation.

Nevertheless, what is relevant to point out is that during some years the National Secretary of Strategic Affairs, and afterwards, the Ministry of Science and Technology, prepared together with the AEB a draft of a broad space legislation to be sent by the President of the Republic to the National Congress. At that time, the Brazilian authorities were convinced that the main legal issues relating to private launching activities in Brazilian territory could only be properly solved through a law approved by the National Congress (Chamber of Representatives and Senate). At that time, the AEB Administrative Edicts were not considered an efficient solution, because of certain limitations: they cannot draft or set a budget of governmental expenses, as this is an exclusive prerogative of the National Congress.

However, later on the authorities came to the conclusion that it would take too much time, maybe many years, until the National Congress would approve an all-embracing law on space activities. Thus, they decided to make use of the AEB's competence "to establish rules and issue licenses and authorizations regarding space activities". This would have the convenience of beginning right away the law-making process required by the pressing need to launch Alcantara into the world market. Brazil seemed to be in a hurry.

Nevertheless, it does not mean at all that the Brazilian authorities have desisted from the project of adopting a great space law passed by the National Congress. Just now the AEB is preparing a draft law with this objective.

4. Details on the Administrative Edicts

Both Administrative Edicts consist of two parts.

The first part of both Edicts includes the formal AEB Presidential decision to approve the Regulation set forth in Article 1 and to establish that the AEB Office for Standards and Licensing "may enact complementary instructions aimed at the performance and administrative actions" related, respectively, to the licensing and authorization procedures (Article 2) and to the authorization procedures.

The first part also indicates that the Regulation enters into force upon publication in the Brazilian Union's Official Gazette (Article 4 and Article 3, respectively).

The first part of the License Edict has one more disposition, which revokes the previous AEB Edict N. 8, of February, 14th, 2001, on the same matter (Article 3).

The second part of each Administrative Edict sets forth the corresponding Regulations. These Regulations constitute the substantive provisions in reference to the licensing and authorization of private launching activities in Brazil.

They are not long documents. The License Regulation has six chapters and 27 articles. The Authorization Regulation has also six chapters, but only 20 articles.

The following are the chapter titles of the License Regulation and of the Authorization Regulation, side by side:

License Regulation	Authorization Regulation
1) General provisions	1) General provisions
2) Documents required and enabling procedures	2) Procedures for authorization
3) Enabling procedures	
4) Administrative sanctions	3) Administrative sanctions
5) Administrative appeal	4) Administrative appeal
6) Final provisions	5) Final provisions

It is quite clear that we have here two different procedures. One can obtain a license without an authorization, but one cannot obtain an authorization without a license. However, a license by itself is not sufficient to receive an authorization. To obtain an authorization it is necessary to fulfill some additional requirements.

4.1. Focus

Both Edicts and Regulations relate exclusively to launching activities and to private participation in them, as the Brazilian interest is focused on nothing other than the commercial potential of the CLA.

This is similar to the laws of Norway (1969) and Australia (1998), dedicated only to space launchings, as well as the special USA acts (1984, 1988, 1994 and 1998) on private commercial space launches.

Both Brazilian Regulations, in Article 1, § 2, establish that they do not apply "to space launching operations that could be carried out by Brazilian government organizations or bodies".

4.2. Definitions of license and authorization

"License" is defined, in Article 2 of its Regulation, as "The administrative deed, within the competence of AEB, authorized by a Resolution of its Higher Council, granted to a legal person, single, an association or consortium, for the purpose of carrying out launching space activities on Brazilian territory, in compliance with the terms and conditions established in this Regulation."

"Authorization" is defined in Article 2 of its Regulation, as "The administrative act, within the competence of AEB, issued by a Resolution of its High Council, to operate a specific space launching in the Brazilian territory, in compliance with the terms and conditions established in this Regulation and pertinent laws."

This way, it is envisaged that the license can be granted to all kinds of private entities – single legal persons and associations or consortiums of legal persons. There are no restrictions on any form of private enterprises.

However, according to Article 6, Sole Paragraph, "License shall only be granted to legal persons, single as well as associations or consortia, having headquarters or representation in Brazil, deemed legally, technically and financially competent, for periods of time established in the deed itself, bearing in mind the period of amortization of investments to be made by the licensee".

If an entity has headquarters in Brazil, it means that it is legally a Brazilian private enterprise, even if it is linked to a foreign company. If an entity has a representation in Brazil, it means that this is a local succursal (subsidiary) of a foreign private enterprise. In any event, of more importance is that the entity proves to be legally, technically and financially competent, at least during the period fixed in the license itself. Its representation in Brazil must have "express powers to be subpoenaed and to answer both at administrative and court levels" (Article 7, License Regulation).

In addition, the license as well as the authorization "may contain restrictive or conditional clauses" (Article 2, § 1 and Sole §, respectively).

4.3. Definition of space launching

The License Regulation defines "Space Launching Activities" as "the set of actions associated with the launching of satellites and other kinds of orbital and sub-orbital payloads, by means of launch vehicles, including the preparation and carrying out of the operation, as well as the elaboration of all technical and administrative documentation related to the launching."

In turn, the Authorization Regulation defines "Space Launching" as "the operation to place or attempt to place a launching vehicle and its payload in sub-orbital trajectory, in Earth orbit or otherwise in outer space."

Thus, a broader definition of space launching activities was adopted in the license procedures. This definition includes "the elaboration of all technical and administrative documentation related to the launching". Whereas, in the authorization procedures, space launching is only the launching operation itself.

Both Regulations (Article 27 and Article 18, respectively) establish that the AEB shall maintain a database for the purpose of registering licenses and authorizations for carrying out space launching activities in Brazilian territory. In addition, according to the Authorization Regulation (Article 19), the "AEB shall establish and maintain a registry book for the inscription of space objects launched into outer space from Brazilian territory". This means that Brazil has decided to fulfill the requirements of the Registration Convention, even if it is not yet Party to this instrument.

4.4. Documents required

To obtain a license – according to Article 6 of the License Regulation– the applicant has to present documents pertaining to:

1) Legal personality;
2) Technical qualifications;

3) Economic and financial qualifications;
4) Tax regularity.

To receive an authorization – according to Article 9, § 2 of the respective Regulation – the applicant is required to present a brief description of the object of the intended authorization, as well as the following documents:

1) Draft of the space launching service contract to be signed by the Licensee;
2) Space launching plan, including orbital data, trajectory and respective timetable;
3) Description of the launching vehicle, including propellants to be used in Earth stage;
4) Description of the payloads, including their purpose or mission, as well as their owners' identification;
5) List of all legal persons involved in the space launching operation along with their respective attributions;
6) Proof of an insurance contract for space launching operation;
7) Proof of payment of all due fees.

4.5. Liability questions

Damage, according to the License Regulation (Article 5), means "loss of life, personal injuries, or other damage to health, loss of State property or of natural or legal persons' property or damages inflicted to such property". It is similar to the wording adopted in the Liability Convention (Article I). The definition of damages included in the Authorization Regulation is broader than the Liability Convention's definition, as it includes not only damage to intergovernmental organizations' property, but also damage to the environment.

This may be explained by the fact that the Brazilian Government and local public opinion consider it essential to safeguard the entire Alcantara region's environment.

One of the economic and financial conditions to obtain a license is "Purchase of insurance to cover possible damages to third parties, according to the degree of risk of the activities to be carried out by applicant, where appropriate, in the value previously established by the AEB" (Article 9, § III).

On the other hand, to obtain an authorization, "the Licensee is required to contract an insurance company to cover damages to third parties that might be involved in each space launching operation, and noting that AEB shall establish the insurance's value" (Article 4).

According to the Authorization Regulation, "the liability for damages due to space launching shall be settled in accordance with space treaties and conventions of which Brazil is signatory, as well as other applicable norms, without prejudice to any contract that might have been celebrated between the parties that laid down rules for the accountability of financial obligations" (Article 4, § 1)

This means that Brazil recognizes its international obligations as a "launching State", liable with regard to every space object launched from the Brazilian territory, including the private launches. At the same time, Brazilian legislation indicates the possibility of contractually sharing with other involved parties the financial obligations derived from damage caused by launched objects.

Both Regulations consider an insurance contract an obligatory requirement, but they only state that the value of insurance will be fixed by the AEB. They don't enter into details about insurance coverage, because the Administrative Edict has no competence to regulate questions involving governmental expenses. These issues are exclusively up to the National Congress.

Will the draft of law that the AEB is currently preparing to propose to the Congress solve this problem? We don't know yet. But it is quite possible that Brazil will follow the example of the U.S. and Australian space legislation and adopt the "maximum probable loss" approach, as professor F. G. von der Dunk has already estimated. (8)

4.6. Foreign legal persons: special requirements

The License Regulation gives special attention to foreign applicants (Article 14). These applicants have to present "statements by their respective home countries as to their being licensed to perform the launching activities intended" (§ 1). It is a way to ensure that the State of the foreign applicant is assuming its international obligations as "launching State", as well.

Moreover, the AEB reserves the right to require, as an additional condition to issue a license to foreign entities, "the existence of a safeguard agreement relating to technology transfer" between their countries and Brazil. Here, it is important to note that the Agreement between Brazil and USA on Technology Safeguards Associated with the USA Participation in Launches from the CLA, of April 18th, 2000 (not yet ratified by the Brazilian National Congress) establishes in Article III, § F, that Brazil has to sign equivalent agreements with any other States also interested in participating in launches from the CLA, if the operation involves USA technology. (9)

4.7. Settlement of disputes

While the License Regulation makes no reference to settlement of disputes, the Authorization Regulation establishes in its Article 20 that "The jurisdiction of Brasilia-DF (Brazilian capital) – the Court of Federal Justice – is elected to settle all controversies regarding the provisions entrusted in this Regulation".

Since it is a body of federal agency (a body of federal administration), the AEB has its headquarters in Brasilia-DF.

5. Business plan

The AEB worked out both Regulations with two basic objectives:

1) To create an environment of absolute legal and technical security, as well as of competent and productive performance, in regard to all phases of the launching activities in the CLA, under Brazilian control and supervision; and

2) To assure the licensees the best conditions for the complete and profitable fulfillment of their business plan.

Are these objectives fulfilled? It is my opinion that it is too early to answer this question. The existing Edicts and Regulations, as I tried to show here, seem to be reasonable documents, despite some imperfections that need to be repaired.

But the last word belongs to the practice, which is not there yet.

6. Brazilian-Ukrainian partnership regarding Alcantara

During the Brazilian Presidential delegation visit to Kiev, January 16-17, 2002, Brazil and Ukraine signed a Technological Safeguard Agreement and a Memorandum of Understanding relating to the commercial use of the CLA by the Ukrainian rockets "Cyclon-4".

It is the first international venture created to offer an attractive alternative to the world market. But there are still serious problems to be solved in order to make this project successful.

The Brazil-Ukraine Technological Safeguard Agreement is now pending ratification by the Brazilian National Congress, and it seems this will not be difficult. The Brazil-U.S. Technological Safeguard Agreement on the use of the CLA by U.S. private enterprises, signed in April 18th, 2000, still has to be ratified by the Congress. This agreement has been contested by the opposition in Congress as harmful to Brazilian sovereignty. It is my opinion that this is a mistaken position. At any moment Brazilian authorities lose the effective control of all main launching operations in CLA, despite the truly rigorous conditions imposed by the Brazil-US Technological Safeguard Agreement. A proof of this is the licensing and authorizing systems just examined here.

The crucial question the CLA project is facing now is that the Brazilian-Ukrainian partnership depends on the approval of the Brazil-U.S. Technological Safeguard in view of the predominant position of U.S. clients in the commercial launch market. (10)

Only after the ratification of both agreements by the Brazilian Congress will the first clients have the legal basis to consider the CLA as a practical option, and then we may see the first application of the new Brazilian launch licensing and authorizing procedures.

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Brazil has not signed the Convention on Registration of Objects Launched into Outer Space (Registration Convention), of January 14, 1975, due to the insufficient information required by Article IV for the registry of objects launched into outer space. It has only an administrative function – to control the quantity of objects launched into outer space, and it does not allow for an evaluation of the real mission of a space object. Many other countries assumed the same position. However, during the 40th Session of the Committee on the Peaceful Uses of Outer Space's Legal Subcommittee, held in Vienna, Austria, from April 2 to 12, 2001, the Brazilian Delegation announced the governmental decision to adhere to the Registration Convention. Brazil's decision is based on the consideration that the political world situation has strongly changed since the 1970's and that it needs to join this convention to be fully in compliance with international legal conditions to commercialize its Alcantara Launching Center in the world market. This does not mean that Brazil renounces its former position. The Brazilian Government believes that by being a Party to the Registration Convention, it will be in a better position to promote the necessary up-dating of this instrument. (See FABRÍCIO DOS SANTOS, Álvaro, *Brazil and the Registration Convention*, Proceedings of The 44th Colloquium on The Law of Outer Space, Toulouse, France, October 1-5, 2001, Published by AIAA, pp. 78-86.)

4) *Pathways to Space – Thirty Years of the National Institute of Space Research* (INPE), Ed. Contexto, 1991.

5) Other Brazilian legal texts which have stimulated the commercialization of the CLA and other space projects include: Administrative Edict CA/MD (Air Command/Defense Ministry) N. 100/GC4, of February 25th, 2000, on the register of Aerospace Industry enterprises and products, for the fulfillment of the covenant on sales tax (tax reduction incentive); Law N. 9.994, of July 24th, 2000, creating the Program for the Scientific and Technological Development of Space Sector (Industry); Normative Instruction N. 29, approved by Federal Income Secretary of the Financial Ministry on March 15th, of 2001, on customs regime to regulate the temporary admission of material necessary for the launching activities of satellites from the CLA.

6) VON DER DUNK, Frans G., *Launching Alcantara into the Global Space Economy – The 2001 Brazilian National Space Law*, presented at the 45th Colloquium on Law of Outer Space, Houston, Texas, USA, October 14-19, 2002.

7) Legal texts which consolidate the civil nature of the AEB, as well as all of the Brazilian space program: Decree N. 1.332, of December 8th, 1994, approving the process of updating of the Policy on Space Activities Development (PNDAE); Law N. 9.112, of October 10th, 1995, on the export of sensitive articles and connected services; Decree N. 1.953, of July 10, 1996, creating the National System of Space Activities Development (Sindae).

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The First Administrative Regulation on Space Activities in China

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INTRODUCTION

The scope of human activities has experienced expansion from land to ocean, from ocean to atmosphere, from atmosphere to outer space. Space technology, which emerged in the 1950s, opened up a new era of human exploration of outer space. Since the first man-made satellite was successfully launched into outer space in 1957, the world's space activities have become increasingly active with the rapid development of space science, technology and applications.

In order to negotiate and resolve the legal issues concerned with space activities, efforts for formulation of international rules for world space activities have been made by the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) since 1958, and from then until 1979 a fairly comprehensive space law system was built.

With the "DHF-I" satellite that was successfully launched by a Long March vehicle in 1970, China became one of the space-faring nations in the world. In 1980, China became a full member of COPUOS. Subsequently, the Chinese Government ratified the "Outer Space Treaty" in 1983, and the "Rescue Agreement", the "Liability Convention" and the "Registration Convention" in 1988.

With the reforming process from planned economy to market economy in China, the trend for commercialization of space activities has influenced the country. The main body of space activities in China has progressively changed from a simple government into multi-bodies. A variety of exclusive natural and juridical persons, state-owned enterprises and non-governmental entities are increasingly participating in space activities, especially with commercial applications of space technology that have been widely and rapidly developed in various aspects of economic construction and people's ordinary life.

In order to effectively exercise the rights and perform the obligations relevant to international space laws, with the purpose of building up a macroeconomic control system and a sound legal system matching with a social market economy, and in order to normatively manage China's space activities, China National Space Administration has been carrying out research on national space laws together with other governmental organs concerned in this regard.

1 Legislation mechanism in China

According to the Constitution and the Legislation Law of the People's Republic of China, the country's State legislation mechanism is a system featured with unification and classifications, mainly divided into three levels:

1) Laws formulated by the supreme power organ of authority – the National People's Congress and its Standing Committee;

2) Administrative laws and regulations formulated by the highest organ of State administration – the State Council – according to the Constitution and Laws; and

3) Departmental Regulations formulated by the Ministries and Commissions of the State Council in accordance with the above-mentioned two levels within the limits of their authorities.

All forms and procedures of the legislation system mentioned above must be performed through four stages: (1) proposal of draft, (2) deliberation of draft, (3) adoption of draft and (4) promulgation. Compared with the other two procedures the legislation procedure for the Departmental Regulation is slightly simpler and faster: it is suitable for solving the urgent issues accrued in the development of the social economy.

2 The present situation and ideas on space legislation in China

Considering the State legislation mechanism, there is a long way to go for the formulation of a national space law. China National Space Administration, being the administrative organ for space industry, presently chooses the establishment of departmental regulations as a priority to regulate space activities. Those departmental regulations will be upgraded into an administrative law, regulations or laws when the current situation is finalized. In the future, a Chinese space law should be a legislation system containing the basic norm(s) of national space law associated with the relevant administrative law(s) and regulations and departmental regulations.

The beginning of the formulation of space law in China can be traced back to the year 1995, but the comprehensive research on the legislation system of a national space law only started after 1998 when the Chinese Government carried out reform of the administrative mechanism for industry. After that, China National Space Administration became the main administrative organ in charge of national space industry and civil space activities, being the body responsible for formulation of regulations on space industry and for making policy on space industry and technology, as well as for setting up development plans and standards for space industry.

China National Space Administration has paid great attention to research on space legislation by organizing a research group consisting of space law experts, main officers from relevant administrative organs, persons from space industry and other entities related to space activities. The early research work started with the “Administrative Regulation on Space Objects”, “Administrative Regulation on Liability for Damage Caused by Launching Space Objects ”, and the “Administrative Regulation on Launching License for Civil Space Activities”.

3 The first administrative regulation on space activities in China

On 8 February 2001, the “Administrative Regulation on Registration of Space Objects”, the first administrative regulation on space activities in China, was issued as a Departmental Regulation. It is in line with the “Registration Convention” and the practical situation in China. It is also easy to operate.

There are sixteen articles in this regulation, with the main ones covering the following issues:

1) The purpose and principle of legislation;
2) The concepts concerned with space objects;
3) Responsible person for registration and his/her obligation;
4) Specific content and requirements for registration;

5) Establishment and management of the National Registration Booklet;
6) The responsible organs both for domestic and international registration and the procedures to follow; and
7) Issues related to registration of space objects for the Hong Kong and Macao Special Administrative Regions of China.

4 Establishment and management of the National Registration Booklet

The National Registration Booklet will be stored and managed by China National Space Administration. With the approval of this Space Administration, and some relevant governmental organs and authorities, natural and juridical persons as well as organizations can apply for information. In addition, a database for space objects has been built.

5 The responsible organs both for domestic and international registration and procedures

China National Space Administration is responsible for the domestic registration, and the Department of Foreign Affairs will be in charge of the daily round. Registration shall be carried out within sixty days after the space object(s) was (were) launched into orbit in accordance with certain registration data listed in the regulation. Modification of the registration shall be done within 60 days after changes in the situation concerning the space object(s) (changes in orbit, disintegration, end of operation, return or re-entry into atmosphere, etc.). The Ministry of Foreign Affairs is responsible for the international registration with the United Nations Secretariat. China National Space Administration shall provide the registration data within sixty days after accomplishment of the domestic registration.

6 Issues relating to registration of space objects for Hong Kong and Macao Special Administrative Regions (SARs)

In view of the localization of space law from the United Kingdom of Great Britain and Northern Ireland and Portugal respectively, a special Sub-Registration Booklet shall be established attached with the National Registration Booklet for Hong Kong and Macao Special Administrative Regions. The registration procedure for Hong Kong and Macao SARs will be stipulated separately. This administrative regulation will have the following characteristics:

- Open ended;
- Possibility of being amended after certain periods of implementation; and
- Possibility of being upgraded into an administrative law or regulation in the future.

CNSA

The First Administrative Regulation on Space Activities in China

Liu Xiaohong , Wang Xiaoqing

UN/IISL Workshop on “Capacity Building in Space Law”

18-21 Nov. 2002 The Hague, Netherlands

Preface

The scope of human activities has experienced expansion from land to ocean, from ocean to atmosphere, and from atmosphere to outer space.

Space technology, which emerged in the 1950s, opened up a new era of human exploration of outer space.

CNSA

Having rapidly developed for about half a century, human space activities have scored remarkable achievements.

Since the first man-made satellite was successfully launched into outer space in 1957, the world space activities have become more and more active. Formulation of international rules for world space activities is needed in order to negotiate and resolve the legal issues concerned.

CNSA

The Chinese government ratified OST, ARRA, LIAB and REG in 1983 and 1988.

With the reform from a planned economy to a market economy, the body of space activities has no longer been the government only.

Building up a sound legal system on space activities in the purpose of matching with the social market economy.

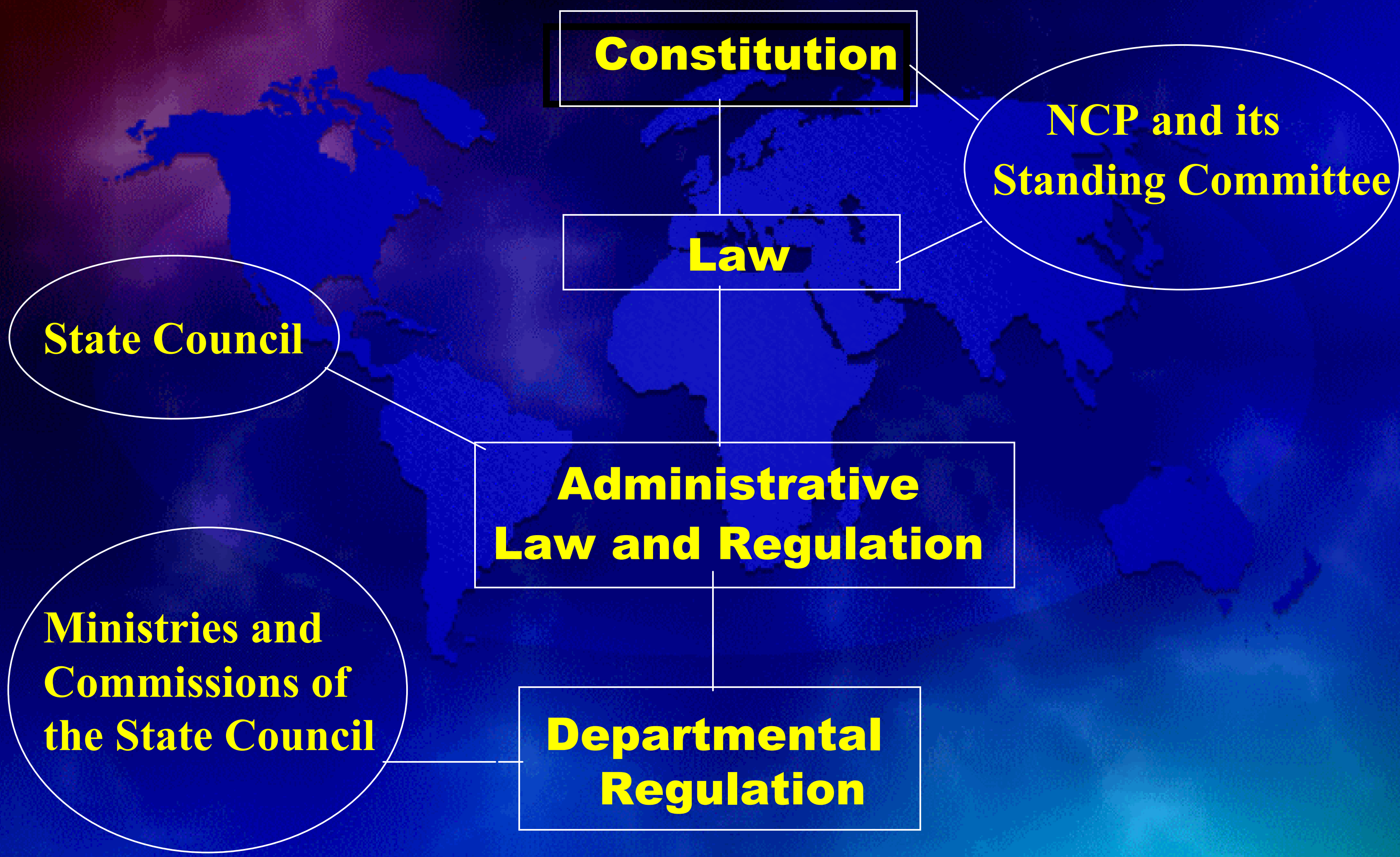
CNSA

The Basic Legislation Mechanism in China

Law

Administrative Law and Regulation

Departmental Regulation


Constitution
NCP and its
Standing Committee
Law
State Council
Administrative
Law and Regulation
Ministries and
Commissions of
the State Council
Departmental
Regulation

Space Legislation in China

- **By Steps:**

1. **Departmental regulations**
2. **Administrative law and regulation**
3. **National Space Law**

CNSA

The First Administrative Regulation on Space Activities in China

- **Issued in 8th Feb. 2001**
- **Formulation**

  《Administrative Regulation on Registration of Space Objects》
- **Feature**

  Harmonization of 《Convention on Registration of Objects Launched into Outer Space》 with practical situation in China.

- **16 articles consists of :**

1. Purpose and Principle;
2. Concepts concerned with;
3. Responsible person for registration and his obligation;
4. The specified contents required for registration;

5. National Registration Booklet and its management;

6. Responsible organs both for domestic and international registrations and the procedures;

7. The registration for Hongkong and Macao Special Administrative Regions.

National Registration Booklet

-Stored and managed by China National Space Administration. (Data base has been built for space objects.)

Responsible Organs both for Domestic and International Registration and the Procedures

-China National Space Administration is responsible for domestic registration.

-Registration shall be done within 60 days after the object(s) was(were) launched into the orbit.;

-Modification registration shall be done within 60 days after the important changes of the situation of the space objects;

-The Ministry of Foreign Affairs is responsible for international registration to the UN Secretariat;

-Within 60 days after the accomplishment of the domestic registration, relative documents shall be provided by China National Space Administration.

Registration for Hongkong and Macao

-Special Sub-Registration Booklet shall be established for Hongkong and Macao, being attached with National Registration Booklets;
-Registration procedure will be stipulated separately.

This departmental regulation will be :

- *Open ended;*
- *Possible being amended after some certain times of implementation;*
- *Possible being up-graded in the future.*

Thank You

for Your Attention !

Swedish Space Legislation

Niklas Hedman
Swedish Ministry for Foreign Affairs

Introduction

The Swedish space legislation gives the jurisdictional framework for Swedish space activities and forms the basis for authorisation procedures with regard to non-governmental space activities, as well as for the registration of Swedish space objects.

Sweden is a State Party to the following treaties governing peaceful activities in outer space:

- Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (*Outer Space Treaty, or OST*);
- Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space *(Rescue Agreement*);
- Convention on International Liability for Damage Caused by Space Objects (*Liability Convention*);
- Convention on Registration of Objects Launched into Outer Space (*Registration Convention*).

When Sweden acceded to the Liability Convention in 1976, its instrument of accession was accompanied by the following unilateral declaration, whereby accepting, on a basis of reciprocity, the binding nature of future awards from a Claims Commission:

"Sweden will recognise as binding, in relation to any other State accepting the same obligation, the decision of a Claims Commission concerning any dispute to which Sweden may become a party under the terms of the Convention"

Such a declaration was made possible by the General Assembly resolution 2777 (XXVI) of 29 November 1971.

Legislative background

Sweden ratified the Outer Space Treaty in 1967. At that time there were no non-governmental space activities in Sweden. Therefore, when the Treaty was ratified, the government argued that legislation requiring authorisation of non-governmental space activities was not needed, but that it could be introduced if and when such activities became a reality.

In the early 1980s, as national interest in space grew, and with the emerging involvement of Swedish companies in international space activities, the view developed that a domestic regulatory framework to authorise non-governmental space activities was necessary to enable Sweden to fulfil its obligations under the Outer Space Treaty. This notion resulted in two domestic legal instruments governing space activities, namely the **Act on Space Activities (1982:963)** and the **Decree on Space Activites (1982:1069)**. These instruments set forth regulations regarding:

- jurisdiction over space activities
- requirements for obtaining a licence
- supervision and control of space activities
- criminal jurisdiction for illegal space activities
- reimbursement of liability incurred by the State
- national registration of objects launched into outer space

The Swedish legislation on space activities is based on three of the main space treaties, namely the Outer Space Treaty, the Liability Convention and the Registration Convention. Two articles of the OST, Article VI and VII, are specifically mentioned in the preparatory work (*Regeringens proposition 1981/82:226*) as constituting the basis for such legislation. A general reference is made to the Liability Convention as being supplemental to the liability regime of the OST. The provisions of the Decree setting forth national regulations regarding the registration of space objects are based on the Registration Convention.

Act on Space Activities (1982:963)

Jurisdiction

The Act on Space Activities applies to "activities in outer space (space activities)". Section 1.2 states that in addition to activities carried on entirely in outer space, also included in space activities are the launching of objects into outer space and all measures to manoeuvre or in any way affect objects launched into outer space.

Activities expressly excluded by Section 1.3 are the mere reception of signals or of data, such as radio and television broadcasting and reception of data from remote sensing satellites. Such activities are covered by other statutes, such as the Telecommunications Act and the Radiocommunications Act.

According to the same provision, the launching of sounding rockets is not designated as space activities. It is emphasized in the preparatory work that the exclusion of the launching of sounding rockets from the scope of the Act is based on international practice, although sounding rockets often reach outer space.

Section 2 of the Act sets forth the jurisdictional framework for national space activities, thereby providing the basis for the authorisation procedure described in the subsequent provisions. Section 2 states that:

"Space activities may not be carried on from Swedish territory by any party other than the Swedish State without a licence. Nor may a Swedish natural or juridical person carry on space activities anywhere else without a licence"

Through the wording of Section 2, the legislator has incorporated all space activities undertaken within the territorial jurisdiction of Sweden as well as all space activities undertaken by Swedish natural or juridical persons outside Swedish territory. The additional extra-territorial application with regard to Swedish natural or juridical persons gives Sweden the necessary tool to fulfil its obligations under the OST.

Authorisation procedure

The procedure for obtaining a licence is qualified by Sections 3 and 4. According to Section 3 the licence to carry out space activities is granted by the government. This is due to the international responsibility of the State laid down in Article VI of the OST, and to the fact that licence decisions can affect Sweden's relationship with foreign powers.

At the time of legislation in 1982, the possibility to delegate decisions did not seem urgent, since it was expected to take a long time before enough decisions had been taken by the government to create a case-law firm enough to be able to be applied by a lower instance.

An application for a licence to carry out space activities shall be submitted to the government through the Swedish National Space Board (Section 3 of the Act and Section 1 of the Decree). The Space Board then consults the Swedish National Post and Telecom Agency, which is the central agency responsible for allocation of frequencies, or other national agencies or authorities affected by the application, and thereafter forwards the application to the government, accompanied by its recommendation. If an application for a licence is not sufficiently clear on which space activities it concerns, a licence will not be granted.

According to Section 3.2 of the Act, a licence may be subject to conditions. This can be done to make sure that the licensed activities will not disturb or interrupt other activities, or through the imposition of time-limits on the licence. Such restricting conditions, however, do not preclude application for a new or more widely framed licence.

A licence to conduct space activities can be revoked according to Section 4.1 of the Act, if the conditions of the licence have been disregarded or if there are other particular reasons for it. There are no such cases of Swedish licenses being revoked. This regulation is designed for extraordinary circumstances.

Supervision and control of space activities

The obligation of continuing supervision stipulated in Article VI of the OST is regulated by Section 3 of the Act and Sections 2 and 3 of the Decree. The national authority responsible for the inspection and control of space activities conducted by licence holders is the Swedish National Space Board.

Criminal jurisdiction

Since the regulations regarding authorisation include extra-territorial applications, such elements had to be reflected in the penalty provisions. This is addressed by Section 5.2 of the Act, thus widening the basic regulation regarding extra-territorial application of the *Swedish Penal Code*. The jurisdictional norms determining when a Swedish court is to adjudicate are stipulated in Chapter 2 of the Penal Code. The references in the Space Act to Sections 2, 3 and 5 of the Penal Code are intended to deal with jurisdictional limitations such as requirements of double criminality. Without these references, Swedish courts would not have jurisdiction regarding crimes committed outside Swedish territory.

Reimbursement of liability incurred by the State

Regulations regarding liability have been incorporated into Section 6. The scope of Section 6 is to implement a possibility for the Swedish government to seek recourse from launch operators which have rendered the Swedish state liable for damages under the Liability Convention. Other situations, outside the scope of the Liability Convention, where the injured interests are of Swedish nationality, would rather be governed by general principles of tort than by the Act on Space Activities. This approach follows the typical Scandinavian tradition and technique with a few central acts supplemented by special statutes, case-law and legal doctrine rather than a comprehensive code.

The main principles of Swedish law regarding non-contractual liability for damage are largely to be found in the *Tort Liability Act (1972:207)*. As a general rule, liability for personal injury and physical damage to property presupposes intention or negligence. Regulations regarding strict liability are often based on international conventions, and have therefore been incorporated into Swedish law by special statutes.

Since Sweden as a State Party to the Outer Space Treaty and the Liability Convention could be liable for damages, regulations regarding reimbursement of liability incurred by the State needed to be incorporated into the Act. There are no provisions on compulsory insurance in the Act. Neither are there any provisions regarding limit of liability. It might be remarked that the Swedish government, in granting a licence under the Act, is free to assess the financial capability of the applicant. The government is also at liberty to attach conditions to a licence.

Decree on Space Activities (1982:1069)

The Decree on Space Activities has two major functions: it defines the role of the Swedish National Space Board regarding the authorisation and supervision of licensed space activities (Sections 1, 2 and 3), and sets forth the national requirements for the registration of space objects (Section 4). The Swedish national register of space objects is maintained by the Swedish National Space Board. The register is to be kept in accordance with the Decree.

<u>National registration</u>

The Swedish National Space Board, which is a central governmental agency under the Ministry of Industry, Employment and Communications, shall keep a register of the space objects for which Sweden is to be considered the launching State according to Article I of the Registration Convention. It is also stipulated that if another State may also be considered a launching State in accordance with the Convention, the space object concerned shall only be registered in Sweden if this has been agreed to by the States concerned (Section 4.2). Specific criteria for national registration under Article IV of the Registration Convention have been incorporated into Section 4.3 of the Decree.

Concluding remarks

The legal framework for Swedish space activities has proved to work well in practice. The government has granted licences for the operation and control in orbit of the following space objects: The scientific satellites *Viking, Freja, Astrid 1, Astrid 2, Odin, Munin,* and the telecommunication satellites *Tele-X, Sirius 1, Sirius 2, Sirius 3*. All of them, except the nanosatellite *Munin*, which was operated by the Swedish Institute for Space Physics in Kiruna, are licensed to one entity, the state-owned *Swedish Space Corporation (SSC)*, which is a publicly registered limited company. The core businesses of SSC are the design, development and manufacturing of satellites, space and microgravity payloads for the science community and the operation of satellites.

For further information on the Swedish space programme:
Swedish National Space Board (www.snsb.se)
Swedish Space Corporation (www.ssc.se)

Appendices

Annex I: Unofficial translation of the Act on Space Activities
Annex II: Unofficial translation of the Decree on Space Activities

Annex I

Act on Space Activities (1982:963)
(unofficial translation)

Sec.1 This Act applies to activities in outer space (space activities).

In addition to activities carried out entirely in outer space, also included in space activities are the launching of objects into outer space and all measures to manoeuvre or in any other way affect objects launched into outer space.

Merely receiving signals or information in some other form from objects in outer space is not designated as space activities according to this Act. Nor is launching of sounding rockets designated as space activities.

Sec.2 Space activities may not be carried out from Swedish territory by any party other than the Swedish State without a licence. Nor may a Swedish natural or juridical person carry on space activities anywhere else without a licence.

Sec.3 A licence to carry out space activities is granted by the Government.

A licence may be restricted in the way deemed appropriate with regard to the circumstances. It may also be subject to required conditions with regard to control of the activity or for other reasons. Inspection of the space activities of licence holders is exercised by the authority decided by the Government.

Sec.4 A licence may be withdrawn if the conditions of the licence have been disregarded or if there are other particular reasons for it.

The Government decides on withdrawal of licences to carry out space activities. Pending a final decision on its withdrawal, a licence may be withdrawn temporarily.

Sec.5 Any person who wilfully or through negligence carries out space activities without the necessary licence shall be sentenced to a fine or to imprisonment for at most one year. The same applies to any person who wilfully or through negligence disregards the conditions laid down as a prerequisite for obtaining a licence.

Any person who has committed a crime outside the country, as referred to in paragraph one, shall be sentenced, if he is in this country, according to this Act and the Swedish Penal Code and at a Swedish court, even though Chapter 2 section 2 or 3 of the said Code is not applicable and notwithstanding Chapter 2 section 5a first and second paragraphs of the said Code. Legal proceedings for a crime as referred to in paragraph one may be taken only with the Government´s consent.

Sec.6 If the Swedish State on account of undertakings in international agreements has been liable for damage which has come about as a result of space activities carried out by persons other than the Swedish State, the persons who have carried out the space activity shall reimburse the State what has been disbursed on account of the above-mentioned undertakings, unless special reasons tell against this.

Annex II

Decree on Space Activities (1982:1069)
(unofficial translation)

Sec.1 Application for a licence in accordance with the Space Activities Act (1982:963) shall be in writing and submitted to the Swedish National Space Board.

The Board shall consult the Swedish National Post and Telecom Agency or other national agencies or authorities affected by the application and forward the issue with comments to the Government.

Sec.2 The Swedish National Space Board shall exercise control of space activities carried out by those who have licences for such activities.

Sec.3 If infringement of the Space Activities Act (1982:963) or of the conditions laid down by virtue of the said Act is suspected, the Swedish National Space Board shall inform the Government.

Sec.4 The Swedish National Space Board shall keep a register of the space objects for which Sweden is to be considered the launching State in accordance with Article 1 of the Convention on Registration of Objects Launched into Outer Space of 14 January, 1975.

If, in addition to Sweden, another State may also be considered a launching State in accordance with the Convention, the space object shall only be registered in Sweden if this has been agreed between the States concerned.

The register shall give

1. a designation or registration number of the space object
2. the date and territory or location of launching
3. basic orbital parameters, including
   a) Nodal period
   b) Inclination
   c) Apogee
   d) Perigee
4. general function of the space object

The Board shall, through the agency of the Ministry for Foreign Affairs, supply the Secretary-General of the United Nations with information from the register.

Russian Space Legislation

United Nations / International Institute of Air and Space Law

WORKSHOP ON CAPACITY BUILDING IN SPACE LAW

The Hague, The Netherlands

19 November, 2002

Alexandra Fassakhova

Historical Background

- No proper national space legislation in Soviet times
- Influence of the general political and economic reform
- Russia is the successor state of the USSR

The Role Of National Space Law

- “Fiscal” objective:

Discharging of the State’s international duties, effective the jurisdiction, guaranteeing safety and national security, ensuring financial interests of the state.

Achieved by licensing and control

- “Promotion” objective:

Facilitation of commercialization and private involvement

Achieved by liability, indemnification and insurance regime,reducing “red tape”, special financing regimes

Legal Framework

- Federal Law "On Space Activity" (1993, amend. 1996)
- Federal Law of the RF "On state support for missile-space industry and space infrastructure of the Russian Federation" (1999)
- Federal Law of the RF "On legal regulation of interaction between subjects of space activity and foreign and international organizations" (2000)
- Statute on Licensing of Space Activities (2002)
- Statute of Russian Aviation and Space Agency (1999)
- a.o.

Institutional Structure

- ➔ President of RF
- ➔ Government of RF
- ➔ Other federal executive bodies:

  RASA, Ministry of Defense, Russian Academy of Science, etc.

RASA

- Legal basis – Statute on RASA (1996)
- Main functions:

(1) realization of space program

through state procurement contracts

(2) management of industry

through state enterprises' and privatized companies corporate bodies

(3) authorization and supervision:

licensing, certification, attestation

Law “On Space Activity”

- ➔Main implementation and framework instrument
- ➔Scope (Art. 2):

“space activity is any activity immediately connected with operations to explore and use outer space”, “comprises creation (including development, manufacture and test), use (exploitation) of space technics, space materials and space technologies and provision of other services connected with space activity, and also international co-operation of the RF in exploration and use of outer space”

Law “On Space Activity” (cont.)

- ➔No indications for “outer space” definition, but “single innocent passage” allowed
- ➔Exercise of jurisdiction over space objects
- ➔No definition of “space objects”

Registration

- ➔Mandatory registration and marking
- ➔No criteria for registration in the law
- ➔No proper national registration, technical recording by the Strategic Forces
- ➔Notification to the UN effected
- ➔Need for legislative intervention

Licensing

- Provided by the Law and Statute on Licensing of space activities (1996), performed by RASA
- Scope: *activity* of

  (1) "organizations and citizens of RF"

  (2) "foreign organizations and citizens *under the jurisdiction* of RF, *if* it includes tests, manufacture, storage, preparations for launch and launch, and control over flights"
- licensing requirements for each of 6 kinds of activity
- continuing supervision
- no possibility of transfer of license or exemption from license

Liability

- ➔ Scope:
  - damage caused by space object of RF
  - on the RF territory “and beyond”
- ➔ Subject to general civil law rules
- ➔ Basis of liability:

(1) damage except in space – strict liability

(2) damage by one RF space object to another – fault

- ➔ All kinds of damages covered
- ➔ Unlimited, not capped by insurance coverage
- ➔ No indemnification of the State, no cross-waivers

Insurance

Art. 25:

"persons using (operating) the space equipment, or those who procure such use, shall provide compulsory insurance for the astronauts' and personnel's life and health, as well as insurance against liability for damage to life, health and property of other persons"

- ➔ Both TPL and IPL should, in principle, be insured
- ➔ No further details as to risks to be insured, minimum insured sums, risk assessment mechanism
- ➔ "Megaruss" and RASA established certain practice
- ➔ Urgent necessity to adopt proper legislation

Conclusions

Current trends to be put into law:

(1) Liberalization (Commercialization and Privatization)

Need for concrete supportive legal mechanisms, flexible control mechanism, transparency and certainty of the law;

(2) International Cooperation

Harmonization of national approaches for the level playfield, the “flow-down” provision for international agreements on authorization and control

Thank you for your attention !

FIELD FISHER WATERHOUSE

THE EUROPEAN LEGAL ALLIANCE

United Nations/International Institute of Air and Space Law

WORKSHOP ON CAPACITY BUILDING IN SPACE LAW

19 November 2002
The Hague, The Netherlands

FIELD FISHER WATERHOUSE

THE EUROPEAN LEGAL ALLIANCE

Session 2

National Space Laws

United Kingdom Outer Space Act

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The Outer Space Act 1986

- The Principles Treaty
- The Liability Convention
- The Registration Convention

A modest measure

- Treaty compliance achieved informally for 20 years
- Prospect of private sector activities prompted the measure
- Designed to enable the UK to fulfil its international obligations

The main elements

- Authorisation and supervision
- Right to recover compensation
- Registration

Authorisation and supervision

- A prohibition regime
- Administered through licence conditions
- Breach of licence conditions is a criminal offence

Right to recover compensation

- A statutory indemnity without limit
- Designed to pass the risk of international liability to the licensee
- Supported in practice by insurance

So what's wrong with that?

- Criminal sanctions for breach of vague or impossible licence conditions
- Brutal indemnity obligations without even safeguards such as:
  - Apportioning liability among other states
  - Seeking indemnity from other participants
  - Raising available defences
  - Giving the authorities discretion

Shelter behind limited liability?

- The Act applies to anyone "carrying on an activity"
- "For the purposes of this Act a person carries on an activity if he causes it to occur or is responsible for its continuing."
- Directors, shareholders, bankers, regulators, suppliers …

THE EUROPEAN LEGAL ALLIANCE

You can't mean it (surely they don't mean it)?

- The only Government guidance is that no licence is needed for:
  - Leasing a transponder
  - Uplinking to a transponder (other than TT&C)
- So directors, shareholders, bankers, regulators, suppliers are all potentially in the frame
- The authorities have no discretion

Conclusion

- Only modest thought went into the measure
- Space activities for UK nationals involve legal as well as physical hazard
- Other countries with more benign regimes will get the business

The End

For further details, contact Tony Ballard at tony.ballard@ffwlaw.com

Capacity Building in Space Law

Presentation of NASA Deputy General Counsel, Robert M. Stephens
http://www.hq.nasa.gov/ogc/

8/8/2003

The Space Act

- Origins
- Scope
- Application of the National Aeronautics and Space Act (Space Act)
  - 42 USC Sec. 2451, *et seq.*

Space Act Origins – Political Climate

- October 4, 1957: USSR launched Sputnik (first artificial satellite); galvanized American opinion
- Throughout mid-1950's: danger of Soviet surprise attack; strategic warning was considered vital to counter or warn of it
- "Open Skies" proposal of President Eisenhower – outer space free to all, where spacecraft of any state may overfly all states for reconnaissance purposes

Space Act Origins

- U.S. public concerned with Soviet leadership in outer space
- President Eisenhower determines civilian control of space activities essential
    - Except for national defense space operations for which DOD is responsible

Space Act Origins – Civilian Space Agency

- July 29, 1958: Section 102 (a): "… it is the policy of the United States that activities in space should be devoted to peaceful purposes for the benefit of all mankind"
- Congress declared NASA to be a **civilian** agency, "headed by an Administrator who shall be appointed from civilian life by the President" Sec. 202(a)
    - Special legislation required in 1989 for President to appoint Rear Admiral Richard Truly as Administrator. Although Truly retired from the Navy before being sworn in as Administrator, the waiver was necessary because he remained an officer on the retired list and was subject to recall
    - Also true for Feb. 2002 nomination of former NASA astronaut and Asst. Dep. Administrator Maj. Gen. Charles F. Bolden, U.S. Marine Corps, to be Deputy Administrator

Space Act Origins – NASA's early days

- By end of 1959, NASA's long range plan included "making feasible the manned exploration of the moon and nearby planets"
- Called for first human flight to the Moon sometime "beyond 1970"
- Broad legislative authority was essential to accomplish this objective

Scope of the Space Act

- Act carefully and knowingly crafted with broad powers
- Act has enabled NASA, through practice in exercising its authority, to use the lineage of such practices to help interpret the outer limits of the Act

Space Act: Objectives

- Sec. 102(d): “The aeronautical and space activities of the United States shall be conducted so as to contribute materially to one or more of the following objectives:”
  - Expansion of human knowledge of the Earth and of phenomena in the atmosphere and space
  - Improvement of usefulness, performance, speed, safety, and efficiency of aeronautical and space vehicles
  - Development and operation of vehicles capable of carrying living organisms through space
  - Establishment of studies of benefits from and problems involved in utilization of space for peaceful and scientific purposes
  - Cooperation with other nations in work done pursuant to this Act and peaceful application of results

Application of Space Act

- Section 203(a): NASA **shall**:
  - Conduct aeronautical and space activities
  - Arrange participation by scientific community
  - Provide widest appropriate dissemination of information about its activities and results
    - NASA TV, Public Affairs, and Education initiatives
  - Seek and encourage fullest commercial use of space
    - ISS Commercialization
  - Encourage USG use of commercially provided services and hardware
    - Requirement to procure commercial land remote sensing data
    - 15 USC 5807: No competition with private sector

Space Act: Variety of Authorities

- Sec. 203(c) provides NASA with broad authority:
  - Hire and retain critical personnel
  - Leverage NASA property for Agency benefit
  - Cooperate in research and development
  - Use force to secure NASA installations
  - Accept unconditional gifts or donations
    - Special legislation required for the *Endeavour* fund:

      Sec. 208 *"Donations for Space Shuttle Orbiter"* authorized the Administrator to accept donations and gifts for construction of a space shuttle orbiter (expired by its own terms Oct. 30, 1992)

Application of Space Act

- Section 203(c)(3): permits NASA to acquire (by purchase, lease or otherwise), construct, improve, operate, and maintain laboratories, research facilities, aeronautical and space vehicles, and other real and personal property, or any interest therein

Application of Space Act

- Section 203(c)(5): provides NASA with flexible authority to enter into "other transactions." Commonly referred to as "Space Act Agreements" which constitute the primary instrument for NASA's collaborative research
- Also allows NASA to retain cost reimbursements
- As broad as is necessary to perform the functions of NASA and fulfill the overall purposes of the Space Act

Application of Space Act

- Section 203(c)(5): confers upon the Administrator the authority to execute various commitments necessary to accomplish NASA's mission, including: contracts, leases and cooperative agreements.
- However, most contracts are executed in accordance with the Armed Services Procurement Act (10 U.S.C. 2303) and the Federal Acquisition Regulations

Application of Space Act

- Section 203(c)(6): allows NASA to use services, equipment and personnel of "Federal and other agencies with or without reimbursement" and requires each department and agency of the Federal Government to "cooperate fully" with NASA in making its personnel available to NASA.

International Cooperation

- Sec. 205: NASA, under foreign policy guidance of the President, “may engage in a program of international cooperation”
  - President Eisenhower, upon signing the Act in 1958, stated that this section authorizes Treaties as well as less formal arrangements for cooperation.”

Application of Space Act

- Section 203(b): more particular direction from Congress
  - (b)(1): NASA shall initiate, support, and carry out research, development and related activities of ground propulsion technologies, for Electric and Hybrid Vehicle Research (1976)
  - (b)(2) NASA shall initiate, support and carry out research, development and related activities in solar heating and cooling (1974)

Application of Space Act

- Section 300: Miscellaneous
  - Transfer of functions among other agencies
  - Unitary wind tunnels
  - Security related provisions
    - Access to restricted information
    - Civil and criminal penalties
  - Property rights in inventions, patents, awards
  - Insurance and indemnification
    - Contractors, entities with which NASA has cooperative agreements, X-vehicles, cross-waivers of liability
  - Trademark protection
- Section 400: Upper Atmospheric Research

Conclusions

- Space Act well conceived
- Agency generally has authority necessary to accomplish its mission
- When NASA requires additional authority, NASA approaches Congress with suggested amendments
  - Space Act amended numerous times,e.g.: recently amended to provide Administrator with authority to indemnify contractors for experimental aerospace vehicles

U.S. Commercial Space Transportation Act

Ken Hodgkins
Deputy Director
Office of Space and Advanced Technology
U.S. Department of State

Assuring reliable and affordable access to space through U.S. space transportation capabilities is a fundamental goal of the United States. U.S. space transportation capabilities have continued to evolve since the beginning of the space age, both technically and institutionally. While at first limited to government vehicles, space transportation services used by the United States today are provided by a diverse mix of public and private sector entities, both domestic and international.

U.S. policy, law and regulation have evolved to encourage and adapt to greater diversity in the provision of space launch services. In particular, the United States has sought to encourage the growth of commercial launch services. In recent years, new technical developments and competitive customer demands have led to increased globalization in the commercial space launch industry. The supply and demand for launch services and related financial and insurance services are increasingly international. This has led to the emergence of international ventures and other partnerships, as well as new technologies.

The basic U.S. legal framework for commercial space launch support was established in 1984 with enactment of the Commercial Space Launch Act (CSLA). The law has been amended several times, including the addition of reentry licensing authority over reusable launch vehicles. The CSLA is codified at 49 U.S. Code, Subtitle IX, Chapter 701. CSLA contains the following stated findings and purposes:

- "the development of commercial launch vehicles, reentry vehicles and associated services would enable the United States to retain its competitive position internationally, contributing to the national interest and economic well-being of the United States";
- "the United States should encourage private sector launches, reentries and associated services"; and
- "only to the extent necessary, regulate those launches, reentries and services to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interests of the United States."

This Act designated the U.S. Department of Transportation as the U.S. licensing authority for commercial launch activities, and assigned it the following basic responsibilities:

- "encourage, facilitate, and promote commercial space launches and reentries by the private sector"; and
- "take actions to facilitate private sector involvement in commercial space transportation activity…"

The CSLA authorizes the Secretary of Transportation to oversee, license, and regulate commercial launch and reentry activities and the operation of launch and reentry sites carried out by the U.S. citizens or within the United States. This authority is exercised today through the Federal Aviation Administration's Associate Administrator for Commercial Space Transportation.

Two centrally important legal components of the licensing program administered by the Federal Aviation Administration (FAA) are financial responsibility and risk allocation requirements. Financial responsibility requirements are generally satisfied through insurance obtained by the launch operator or licensee.

More on this later. But first, who is required to obtain a launch or launch site license?

FAA has legislative authority to license any person conducting commercial launch activities (including the operation of a launch site) within the United States. It also has legislative authority in the case of a United States citizen, or an entity operating under United States jurisdiction, conducting a launch or operating a launch site outside of the United States.

FAA also licenses foreign entities in which a United States citizen has a controlling interest if that entity wishes to conduct launch operations in an area that is both outside the United States and outside of the territory of any foreign nation. If the United States has an agreement to allow another nation to regulate this area, that nation gains jurisdiction. If there is an agreement that United States jurisdiction applies to a foreign location, then the FAA does have responsibility for licensing that launch or launch site.

FAA does not review amateur rocket activities (defined as launch activities conducted at private sites involving rockets with a total impulse of 200,000 pound-seconds or less, an operating time of less than 15 seconds, and a ballistic coefficient less than 12 psi). Also, AST does not review space activities conducted by or on behalf of the United States government.

The United States issues two general types of launch licenses: a launch-specific license and a launch operator license. A launch-specific license authorizes a licensee to conduct one or more launches, having the same launch parameters, of one type of launch vehicle from one launch site. The license identifies, by name or mission, each launch authorized under the license. A licensee's authorization to launch terminates on completion of all launches authorized by the license or the expiration date stated in the license, whichever occurs first. A launch operator license authorizes a licensee to conduct launches from one launch site, within a range of launch parameters, of launch vehicles from the same family of vehicles transporting specified classes of payloads. A launch operator license remains in effect for five years from the date of issuance. The first licensed commercial launch was conducted in 1989, and 146 licensed launches have been conducted as of this year.

In brief, the process of licensing consists of seven elements:

1. Pre-application Consultations: Prior to submitting a license application, the applicant and the FAA engage in a pre-application consultation process, familiarizing the FAA with the applicant's proposal and the applicant with the licensing process.

2. Policy Review and Approval: Once an application has been received, the FAA conducts its own review of the proposed mission to determine whether it presents any issues affecting U.S. national security or foreign policy interests or international obligations.

3. Safety Review and Approval: The purpose of the safety review is to determine whether an applicant can safely conduct the launch of the proposed launch vehicle(s) and any payload. A licensee is responsible for public safety and must demonstrate that its commercial launch operations will pose no unacceptable threat to the public. To do this, applicants typically perform quantitative analyses of the reliability and functions of critical safety systems, the hazards associated with the hardware, and the risk those hazards pose to public property and individuals near the launch site and along the flight path, to satellites and other on-orbit spacecraft. Applicants also detail the organizational attributes of the applicant, such as launch safety policies and procedures,

communications, qualifications of key individuals, and critical internal and external interfaces.

4. Payload Review and Determination: The FAA reviews a payload proposed for launch to determine whether its launch can be conducted safely and whether the license applicant or payload owner or operator has obtained all required licenses, authorizations, and permits, unless the payload is exempt from review. The FAA does not review payloads otherwise subject to regulation by the Federal Communications Commission (FCC) or the National Oceanic and Atmospheric Administration (NOAA) or owned or operated by the U.S. government.

5. Environmental Review: An evaluation is conducted to assess the environmental impact of proposed launch activities under the National Environmental Protection Act.

6. Financial Responsibility Determination: The CSLA requires that all commercial licensees demonstrate financial responsibility to pay compensation for the maximum probable loss from claims by a third party for death, bodily injury, or property damage or loss resulting from an activity carried out under the license and the U.S. government against a person for damage or loss to government property resulting from an activity carried out under the license.

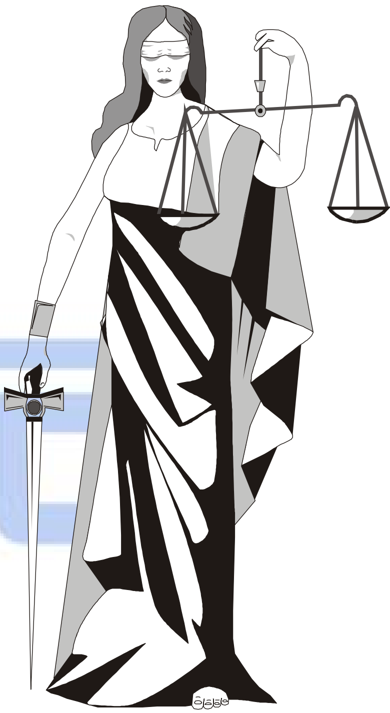
The FAA sets the amount of financial responsibility required of the licensee up to statutory limits. Typically, a licensee satisfies the requirement by purchasing insurance in the amount specified. The maximum probable loss determination is based on an analysis and assessment of the maximum value of loss or damage to government and third party property and third party injuries that can reasonably be expected to result from licensed activities in the event of a mishap. The CSLA and implementing regulations, 14 CFR Part 440, describe other features of the statutory risk sharing arrangement, including provisions for payment by the government of third party claims in excess of required insurance, commonly known as indemnification. Under the CSLA, the government would provide up to $1.5 billion, as adjusted for post-January 1, 1989 inflation, in payment of third party claims that exceed required liability insurance coverage resulting from a catastrophic event.

7. Compliance Monitoring: FAA has the authority to monitor the activities of a licensee to determine if the licensee is in compliance with FAA regulations and the terms of the license. Under the law, access shall be granted to individuals authorized by FAA to observe any activities of the licensee, or of the licensee's contractors or subcontractors, associated with the licensed launch. If a licensee has substantially failed to comply with the relevant laws, regulations, or terms of its license, the license can be suspended or revoked. Depending on the infraction, the licensee may also be subject to a civil penalty.

As part of the broad scope of its authority, the FAA also licenses launch and reentry sites. An application for a license to operate a launch site is conducted in much the same way as an application for a launch vehicle license. As with a launch license, a site license requires the licensee to demonstrate that the site does not pose a threat to public health and safety, private property, United States national security or foreign policy interests, and will not violate the United States' international obligations. The applicant must demonstrate that it is possible to launch at least one vehicle type on at least one launch trajectory. However, FAA conducts a financial responsibility determination for launch sites as it does for launch activities because this provision is not contained in the Commercial Space Launch Act.

A launch site operator is required to provide such environmental information as FAA deems necessary to allow it to comply with NEPA. As with a vehicle license, it is necessary that a site operator diligently follow the terms of the site license in order to remain in compliance with AST rules and regulations.

INDIAN SPACE PROGRAMME
&
ITS POLICY DIMENSIONS



UN workshop on
Capacity Building in Space Law
November 19, 2002

Dr. Rajeev Lochan
Assistant Scientific Secretary
Indian Space Research Organisation

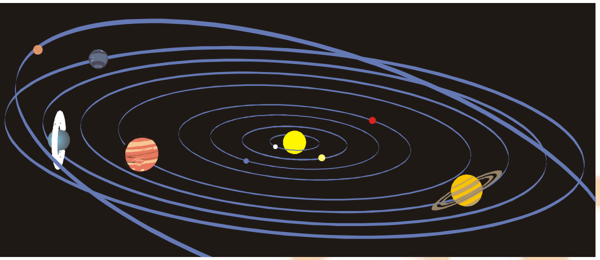
The Birth of Indian Space Program

1947 : The Independence of India

Developmental Issues

Vast resources running to waste

In short, Rich country inherited by developing society



Formidable challenge to the builders of Nation

No wonder, Socio-economic concerns form the nucleus of the Indian Space endeavour

SPACE POLICY

" ….. We are convinced that if we are to play a meaningful role nationally or in the comity of nations, we must be second to none in the application of advanced technologies to the real problems of man and society, which we find in our country. And we should note that the application of sophisticated technologies and the methods of analysis to our problems is not to be confused with embarking on grandiose schemes whose primary impact is for show rather than for progress measured in hard economic and social terms".

Dr. Vikram Sarabhai

- **Frank Admission : Existence of abundant down-to-earth problems of development.**
- **Prudent assertion : Science &Technology being crucial apparatus for development.**
- **Commitment : Science &Technology for socio-economic benefits in preference to display of grandeur.**

- **Military Superiority**
- **Technological Dominance**
- **Display of Grandeur**

Indian Space Program is very different. Very deeply rooted to the society.

INDIAN APPROACH TO SPACE

Space for Development

– **Abundance of Problems of Development Shaped the Indian Approach to Space**

– **Two Crucial Sectors of Space Applications**

  - **Remote Sensing**
  - **Telecommunications & Meteorology**

Commercial Procurement

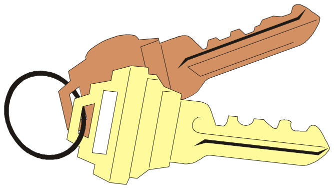
Quick & Effective

Self Reliance

- **Huge Investments**
- **High Risk**
- **Large Gestation Periods**

Self Reliance

Against a possible alternative of reliance on foreign cooperative or commercial arrangements, self reliance was targeted since " ···· large scale benefits can accrue to a large country like India only when we have our own space segment specifically tailored to meet our requirements"

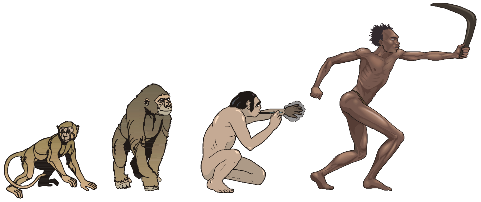


KEY ELEMENTS OF OUR STRATEGY

- Judicious mix of build & buy options dovetailed to user needs enabling timely introduction of services & establishment of self- reliance in a pragmatic way
- Time & cost advantage through the ability to continuously upgrade the technology through adoption & absorption and suitably tuning & improving to higher efficiency & performance

Did it work?

- India is now self-reliant in space even though it does not mean producing all technological systems
- Most technologies are mastered and absorbed though not all of them are put in mass production.
- Immunity against "Technology Denials"
- Remarkable benefits to common man in timely & Cost- effective manner



HOW DID WE EVOLVE?

1st Phase : Initiation Phase

- **Efficacy Evaluation of space systems as either alternative to conventional terrestrial systems or as complementary / supplementary to conventional approaches**

SITE, STEP; LANDSAT Imagery

Use of foreign Space Systems, configuring the ground system to suit the national needs and conditions, and working closely with the potential user community

2nd Phase : Experimental Phase

- **Creation of end-to-end capability in the design, development and in-orbit management of space systems together with associated ground systems**

BHASKARA – 1 & 2, APPLE, SLV, ASLV

3rd Phase : Operational Phase

- **Creation of Major Space Infrastructure**
  - **INSAT : Indian National Satellite System**
  - **IRS : Indian Remote Sensing Satellite**
  - **PSLV : Polar Satellite Launch Vehicle**

Current Operational systems have capabilities at contemporary levels and could provide services comparable to anywhere in the world

EARTH OBSERVATION SYSTEMS

"Science alone could solve the problem of hunger and poverty, insanitation and illiteracy, of superstition and deadening custom and tradition, of vast resources running to waste, of a rich country inherited by starving people"

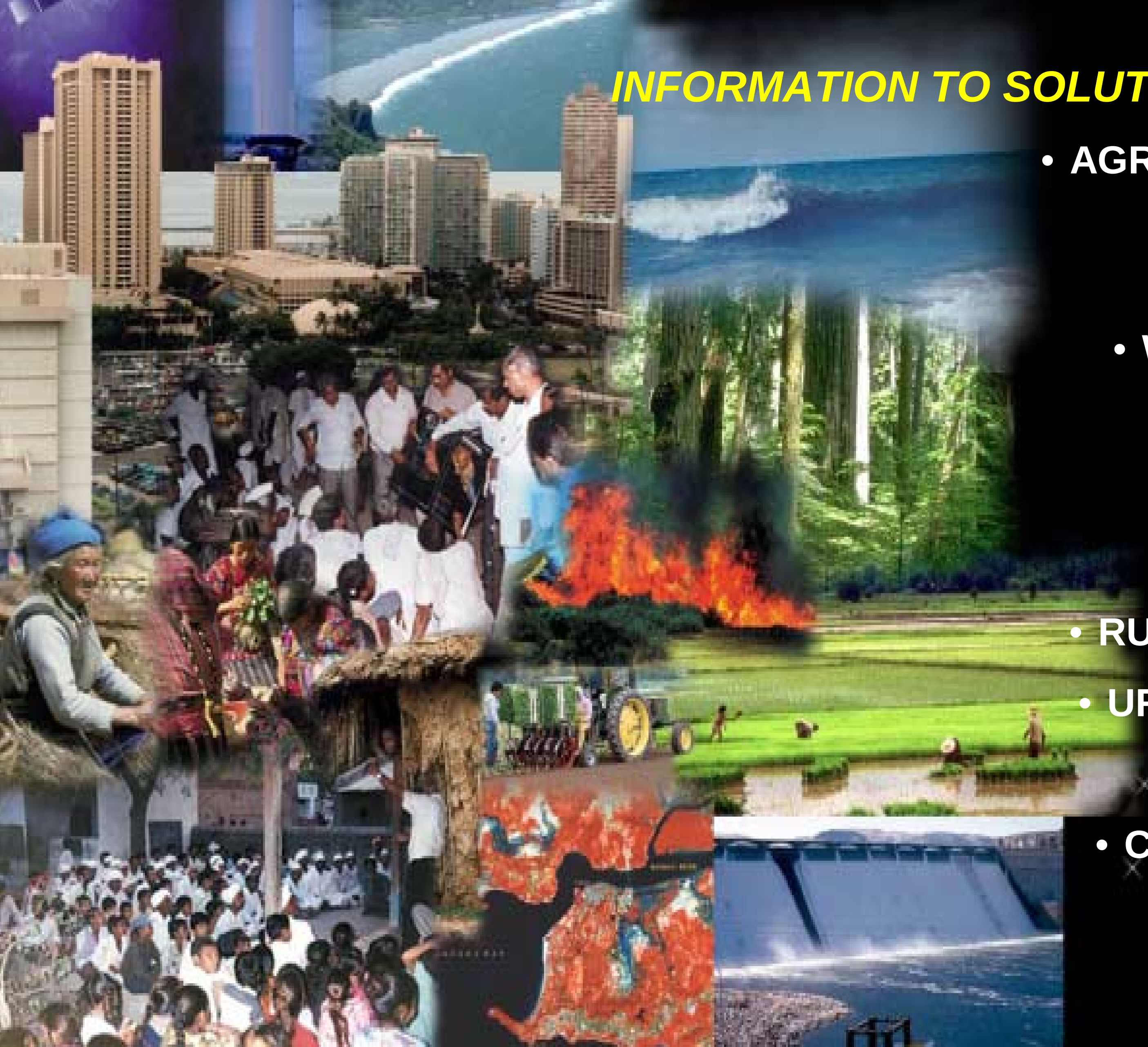
------- Pandit Jawahar Lal Nehru ------

Science Policy Resolution, 1958

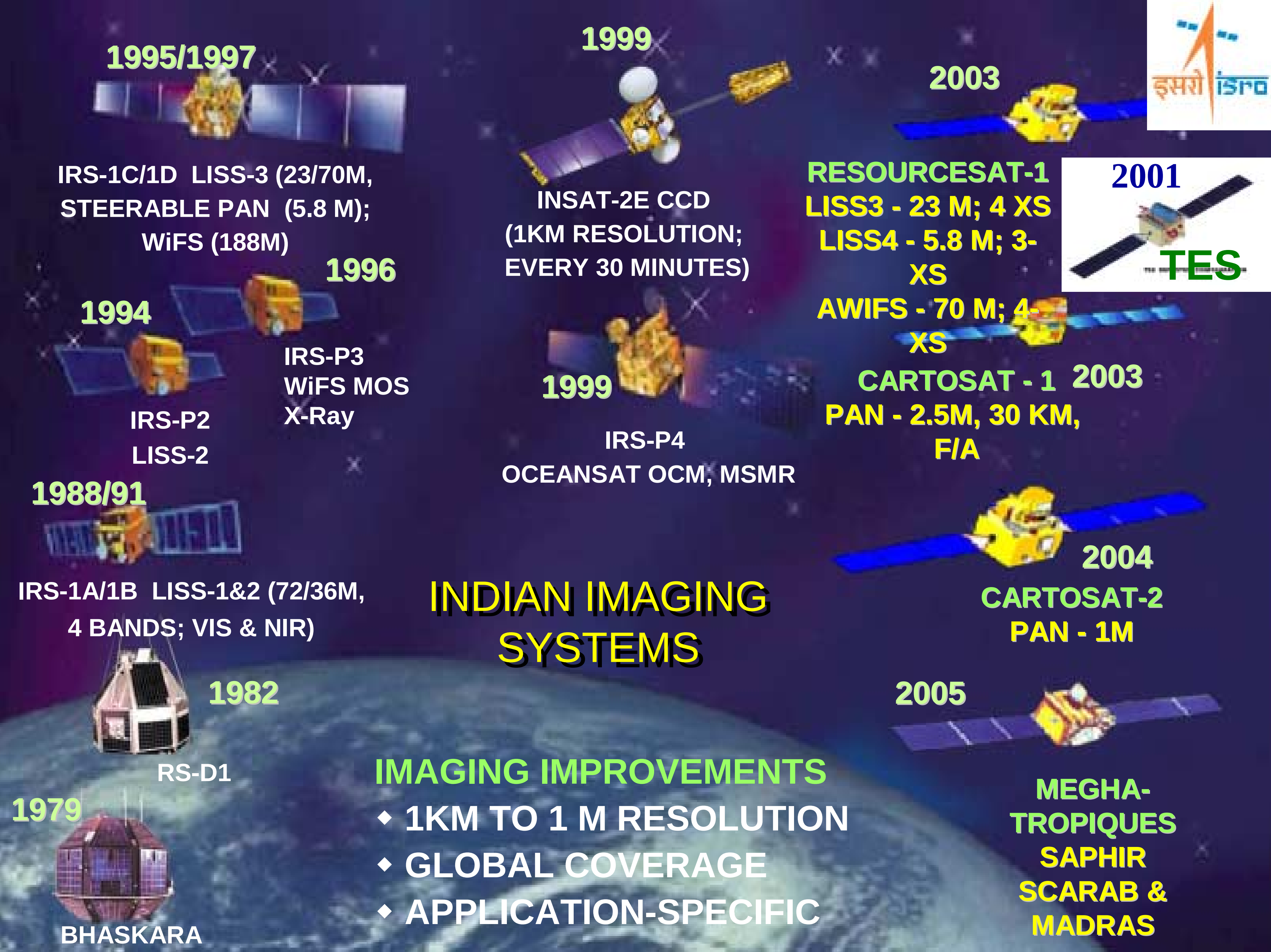
IRS-1B	..	August 29, 1991
IRS-IC	..	December 28, 1995
IRS-P3	..	March 21, 1996
IRS-1D	..	September 29, 1997
IRS-P4	..	May 26, 1999
TES	..	October 22, 2001

REMOTE SENSING APPLICATIONS

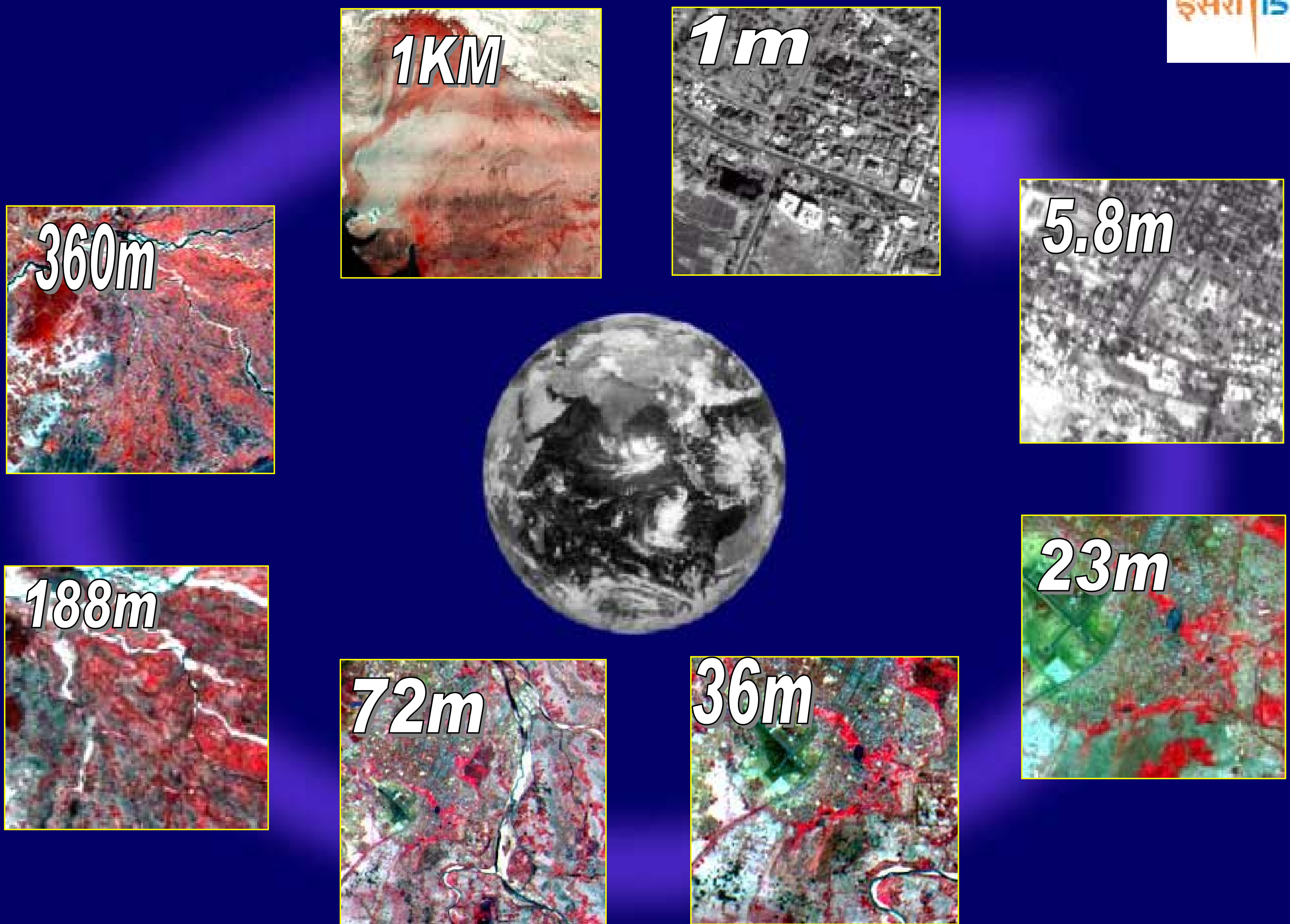
INFORMATION TO SOLUTIONS



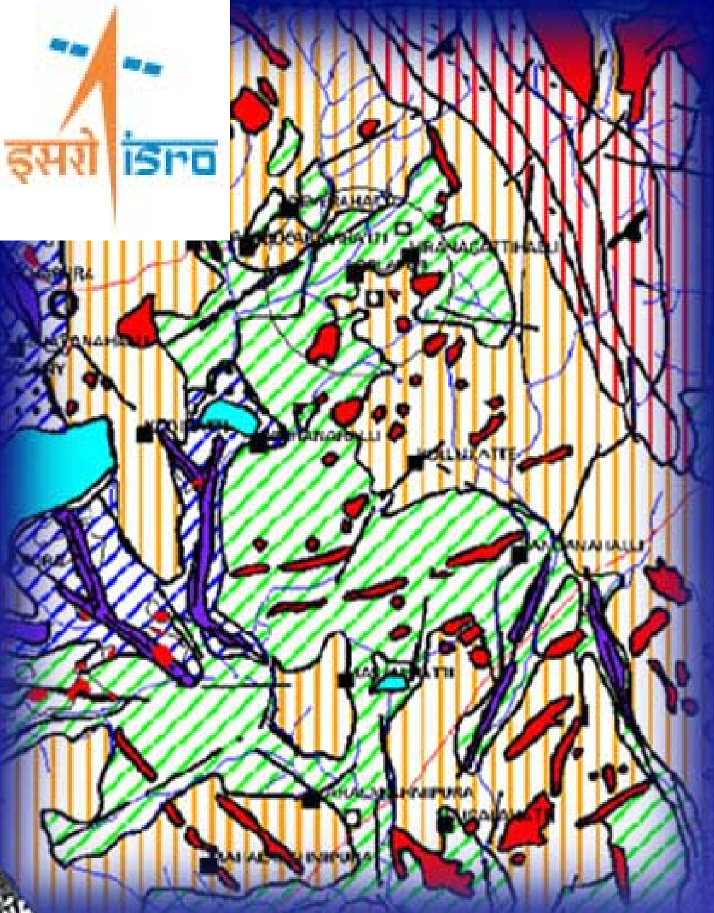
- AGRICULTURE & CROPS
- FOREST & BIO-RESOURCES
- WATER RESOURCES
- GEOLOGY
- OCEAN/COASTAL
- ENVIRONMENT
- RURAL DEVELOPMENT
- URBAN MANAGEMENT
- CARTOGRAPHY
- CLIMATE MODELLING
- GLOBAL CHANGE


INDIAN IMAGING SYSTEMS
1979
BHASKARA
1982
RS-D1
1988/91
IRS-1A/1B LISS-1&2 (72/36M, 4 BANDS; VIS & NIR)
1994
IRS-P2
LISS-2
1996
IRS-P3
WiFS MOS
X-Ray
1995/1997
IRS-1C/1D LISS-3 (23/70M, STEERABLE PAN (5.8 M); WiFS (188M)
1999
INSAT-2E CCD
(1KM RESOLUTION; EVERY 30 MINUTES)
1999
IRS-P4
OCEANSAT OCM, MSMR
2003
RESOURCESAT-1
LISS3 - 23 M; 4 XS
LISS4 - 5.8 M; 3-XS
AWIFS - 70 M; 4-XS
2001
TES
इसरो isro
CARTOSAT - 1 2003
PAN - 2.5M, 30 KM, F/A
2004
CARTOSAT-2
PAN - 1M
2005
MEGHA-TROPIQUES
SAPHIR
SCARAB &
MADRAS
IMAGING IMPROVEMENTS
1KM TO 1 M RESOLUTION
GLOBAL COVERAGE
APPLICATION-SPECIFIC

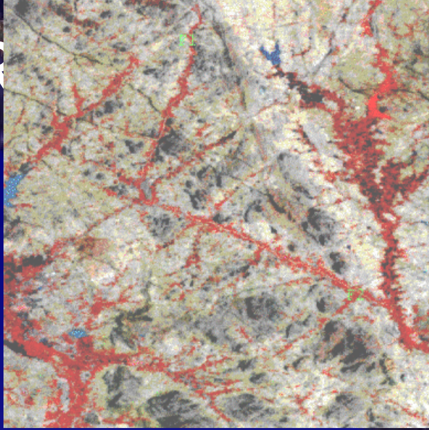
INDIAN IMAGING CAPABILITY



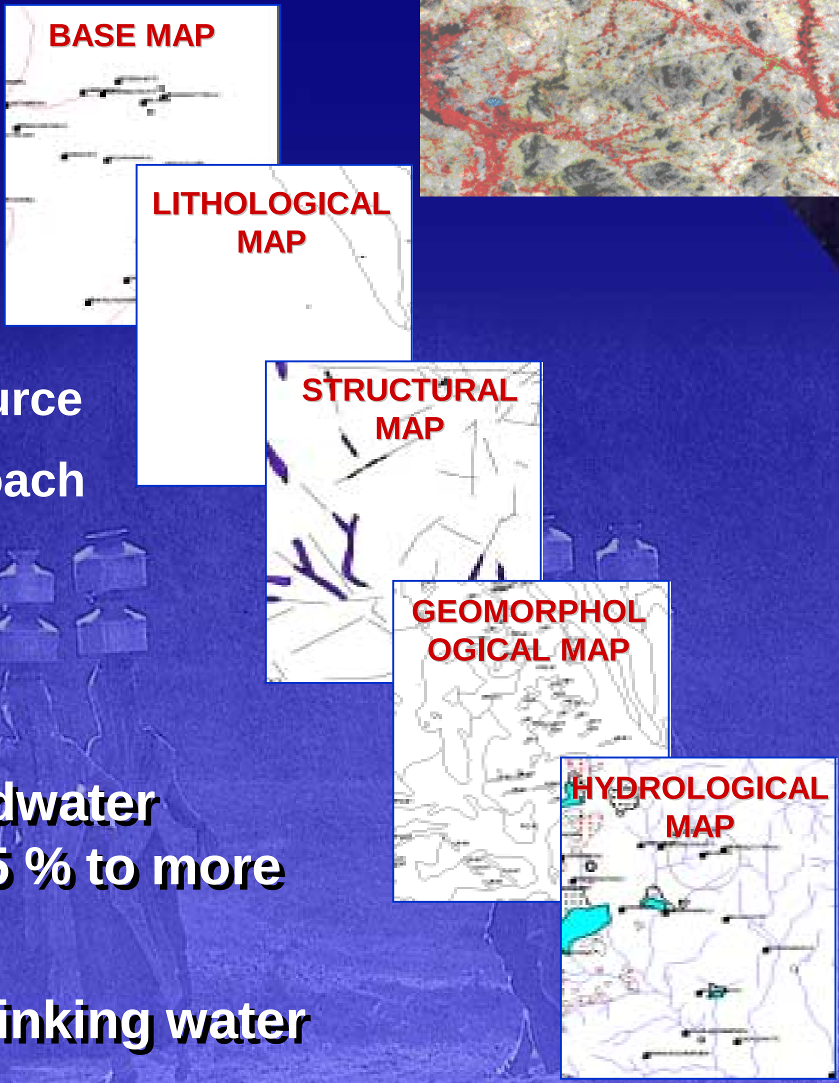
DRINKING WATER FOR NATION



HYDRO-GEOMORPHOLOGICAL MAP



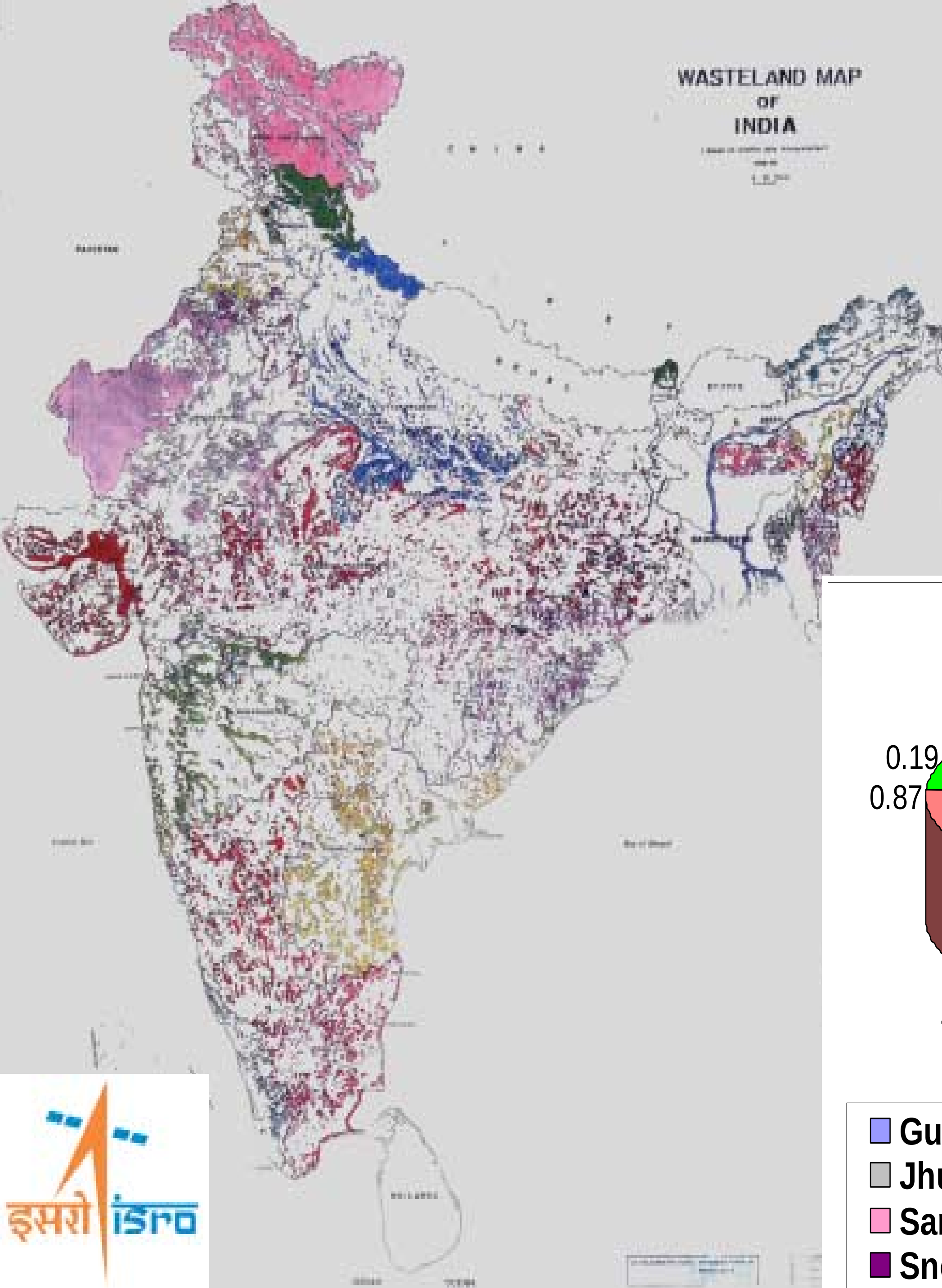
Scientific source finding approach



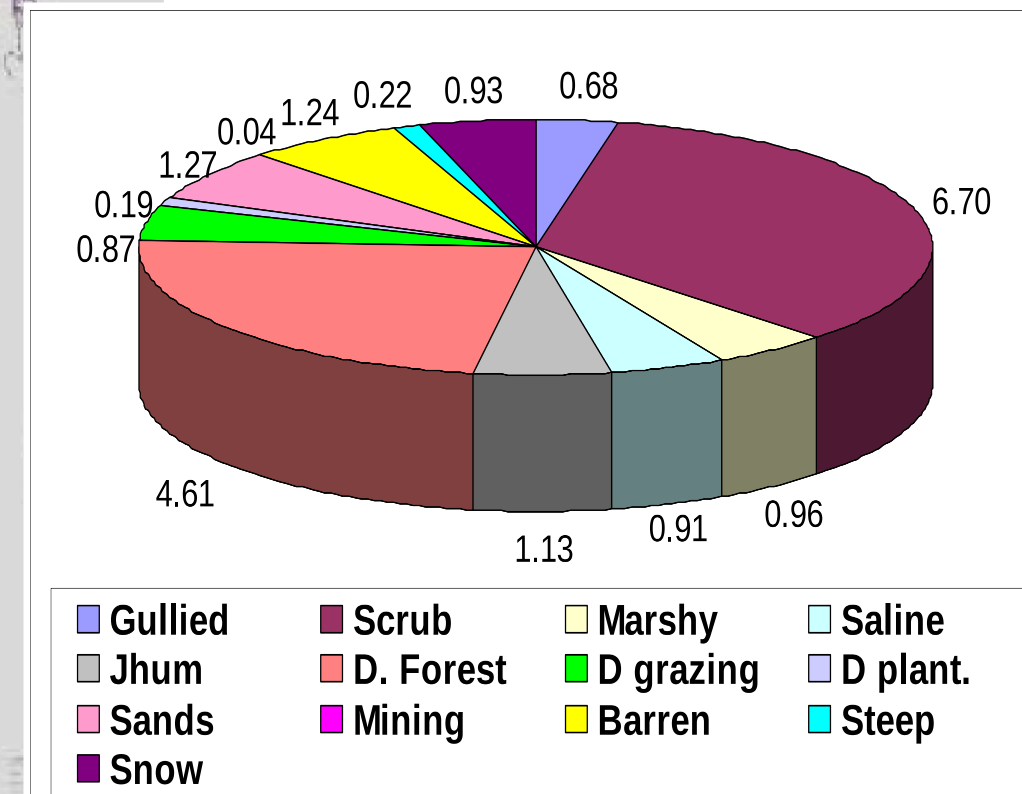
- **Success rate for groundwater targeting raised from 45 % to more than 90%**
- **160,000 villages with drinking water problem got benefited**
  - **Prospecting and sustainable development**

WASTELAND MAPPING OF INDIA

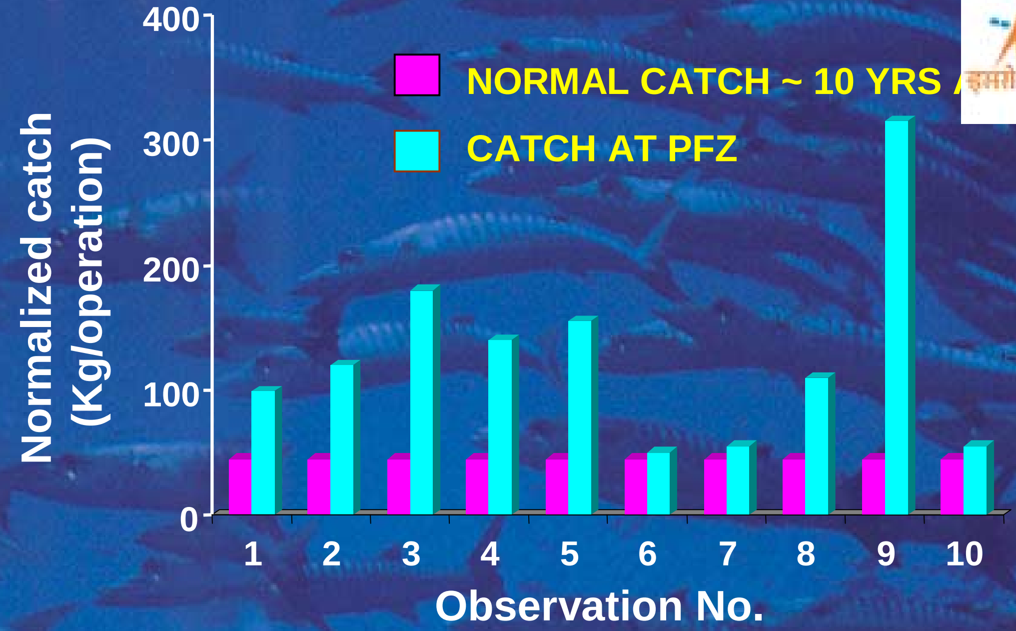
SCALE-1:50,000



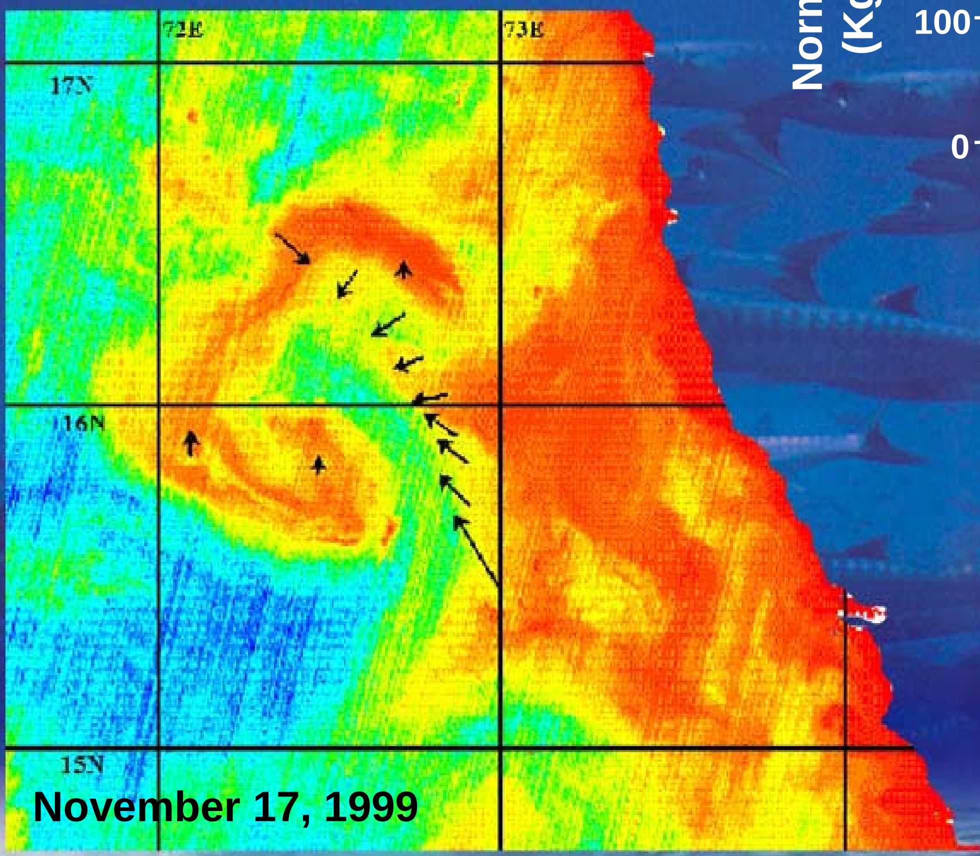
WASTELANDS IN INDIA
(PERCENT WISE)

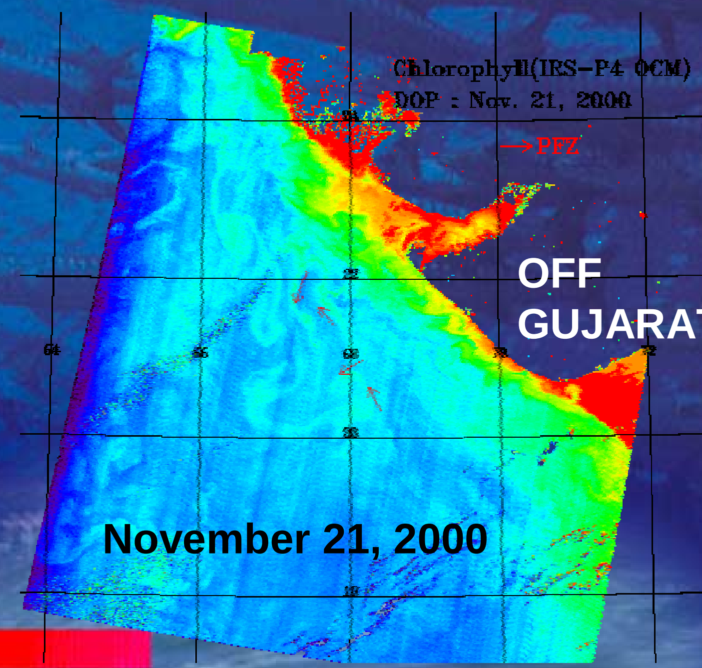


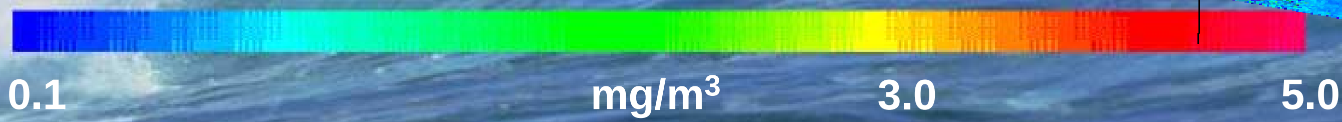
POTENTIAL FISHING ZONE
(IRS P-4 OCM DERIVED)

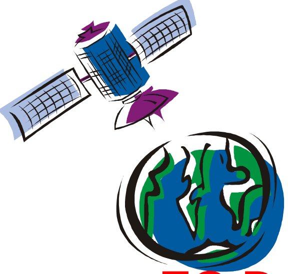


OFF GOA



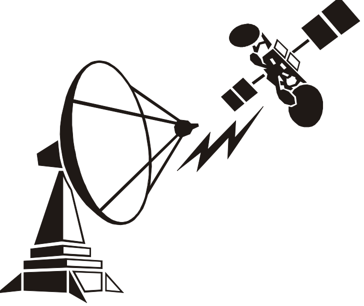






REMOTE SENSING DATA POLICY

- EO DATA AN INSTRUMENT FOR "PUBLIC GOOD"
  - SUPPORT NATIONAL DEVELOPMENT AS KEY INFORMATION SOURCE FOR MANAGEMENT OF NATURAL RESOURCES; ENHANCE KNOWLEDGE & COMMERCE
- NATIONAL SECURITY, INTERNATIONAL OBLIGATIONS & FOREIGN POLICY INTERESTS – A MATTER OF UTMOST IMPORTANCE
- RESPECTS THE 1986 UN RESOLUTION (41/65)
  - BENEFITS TO ALL ON A NON-DISCRIMINATORY BASIS WITH PARTICULAR CONSIDERATION TO DEVELOPING COUNTRIES [I(A) & II]
  - PROMOTE PROTECTION OF NATURAL ENVIRONMENT [X] & PROTECTION OF MANKIND FROM NATURAL DISASTERS [XI]
- NATIONAL AGENCY FOR IMAGE ACQUISITION & DISSEMINATION
  - UPTO 5.8 M NON-DISCRIMINATORY ACCESS
  - HIGH RESOLUTION IMAGES – REGULATED THROUGH AUTHENTICATION OF USER & APPLICATION
- OWNERSHIP RIGHTS ON VALUE-ADDITION



INDIAN NATIONAL SATELLITE SYSTEM (INSAT) ESTABLISHED 1983

Space Based Communication

- Inherent Flexibility
- Distance Insensitive
- Ability to reach far flung areas
- Cost effective

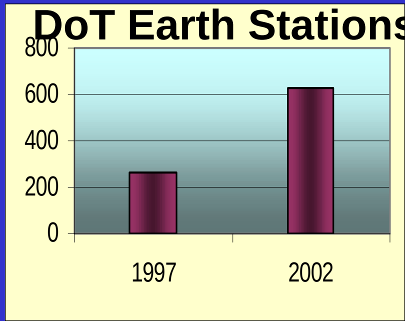
Difficult terrain & dense concentration of population make satellite communication more attractive than conventional approach requiring huge investment

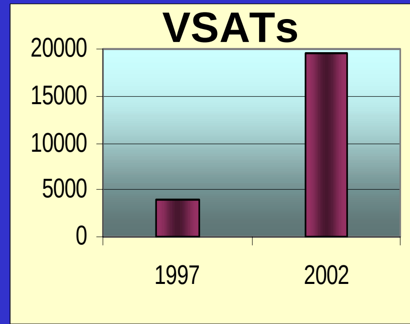
-- Telecommunication

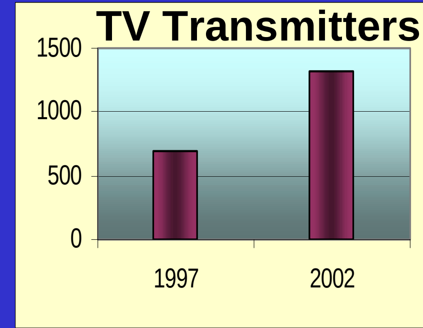
-- TV Broadcasting

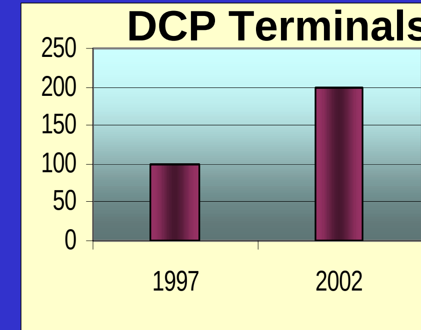
-- Meteorology

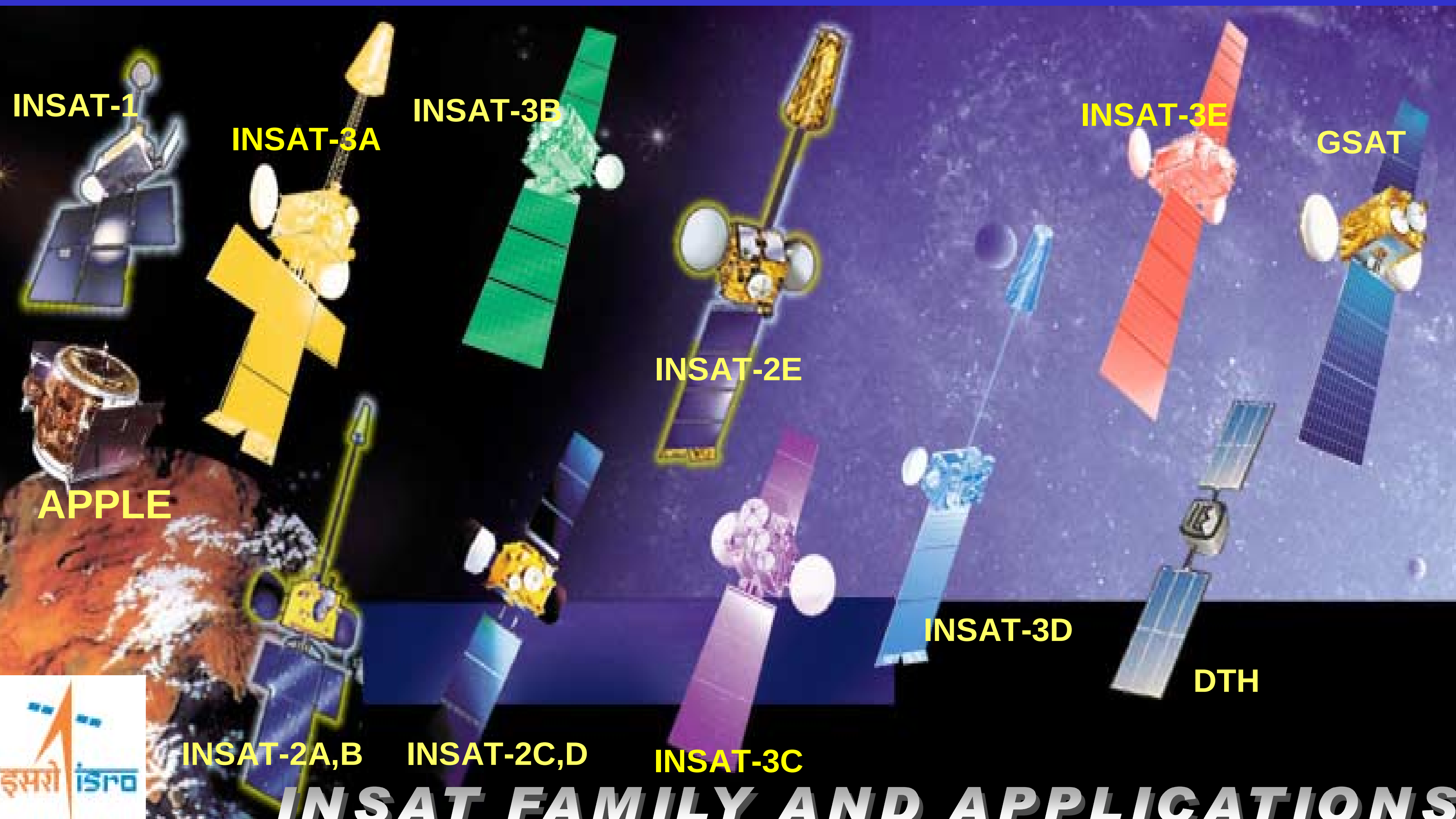
-- Disaster Warning


DoT Earth Stations
800
600
400
200
0
1997
2002

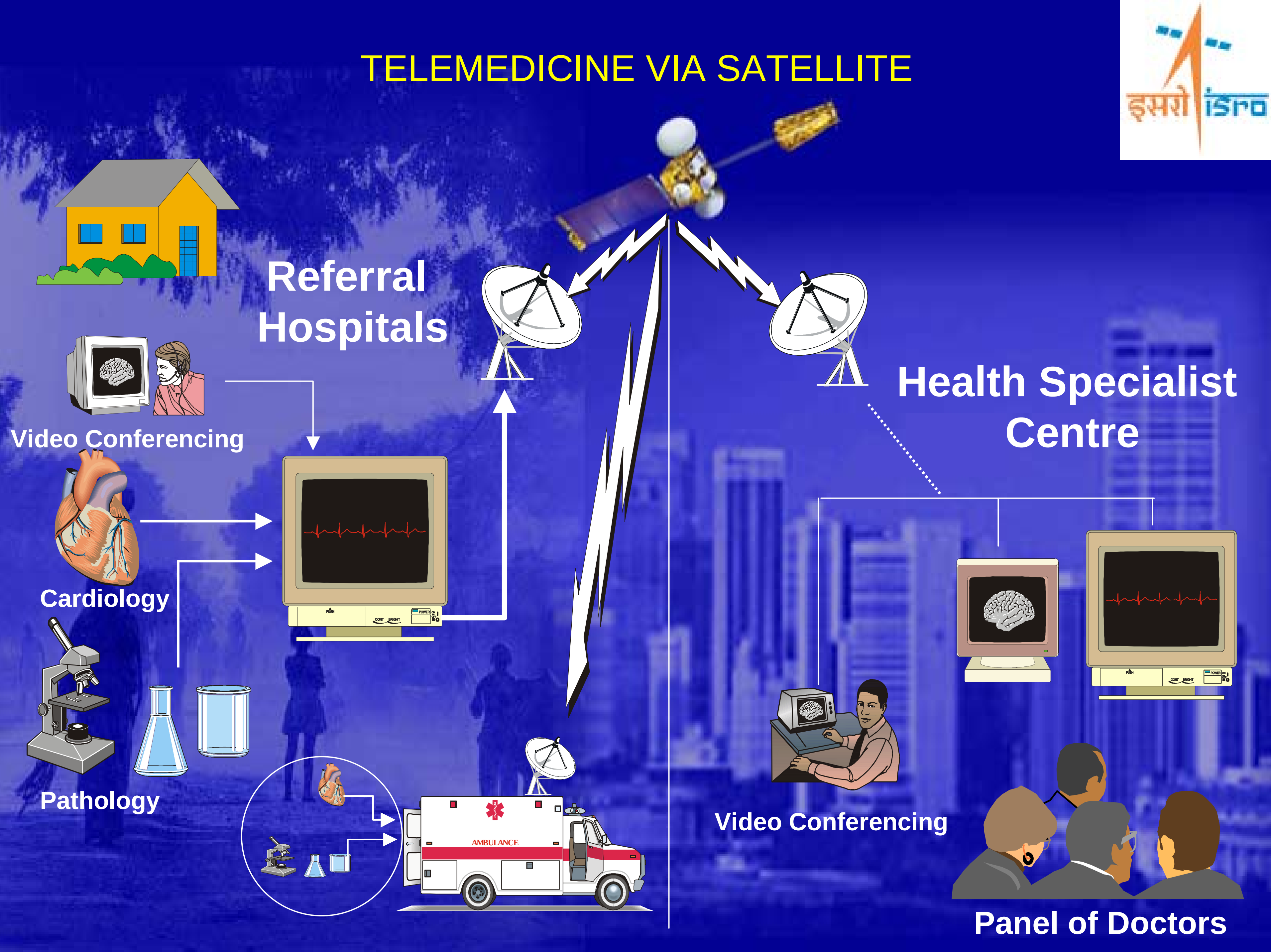

VSATs
20000
15000
10000
5000
0
1997
2002

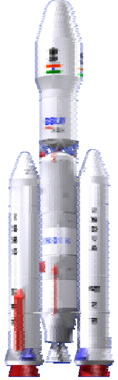

TV Transmitters
1500
1000
500
0
1997
2002


DCP Terminals
250
200
150
100
50
0
1997
2002


INSAT-1
INSAT-3A
INSAT-3B
INSAT-3E
GSAT
INSAT-2E
APPLE
INSAT-3D
DTH
INSAT-2A,B
INSAT-2C,D
INSAT-3C
INSAT FAMILY AND APPLICATIONS

SPACE AND EDUCATION


TELEMEDICINE VIA SATELLITE
इसरो isro
Referral Hospitals
Video Conferencing
Cardiology
Pathology
AMBULANCE
Health Specialist Centre
Video Conferencing
Panel of Doctors



Launcher Development

An inevitable corollary of self-reliance

Intricacies of Launch vehicle technology through SLV

First Flight	-	August 10, 1979	-	Failure
Second Flight	-	July 18, 1980	-	Success
Third Flight	-	May 31, 1981	-	Success
Fourth Flight	-	April 17, 1983	-	Success

Technology leaps from SLV to PSLV & GSLV through ASLV

First Flight	-	March 24, 1987	-	Failure
Second Flight	-	July 13, 1988	-	Failure
Third Flight	-	May 20, 1992	-	Success
Fourth Flight	-	May 4, 1994	-	Success

PSLV : Work Horse for Remote Sensing

First Launch	-	September 20, 1993	-	Failure
Second Launch	-	October 15, 1994	-	Success
Third Flight	-	March 21, 1996	-	Success
Fourth Launch	-	September 29, 1997	-	Success
Fifth Launch	-	May 26, 1999	-	Success
Sixth Launch	-	October 22, 2001	-	Success
Seventh Launch	-	September 12, 2002-		Success

PSLV has proven its capability for multi payload, multimission and now Geosynchronous missions as well

GSLV : Work Horse for Geo Stationary Satellite. Success in the very first launch

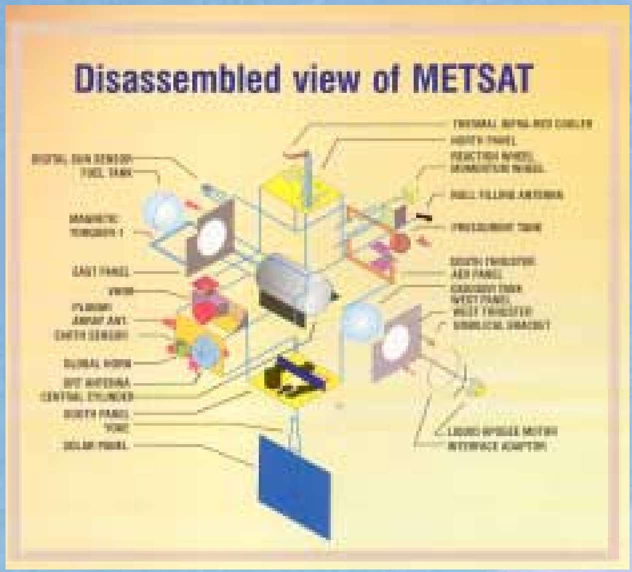
ISRO LAUNCHERS

	PSLV	GSLV	GSLV-MkIII
WEIGHT(t)	294	400	629
PAYLOAD (kg)	1200 SSO	1800 GTO	4000 GTO
FLIGHTS	7 (93 –02)	1 (2001)	--

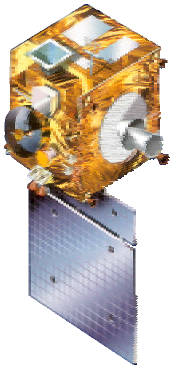
PSLV- C4 / METSAT MISSION

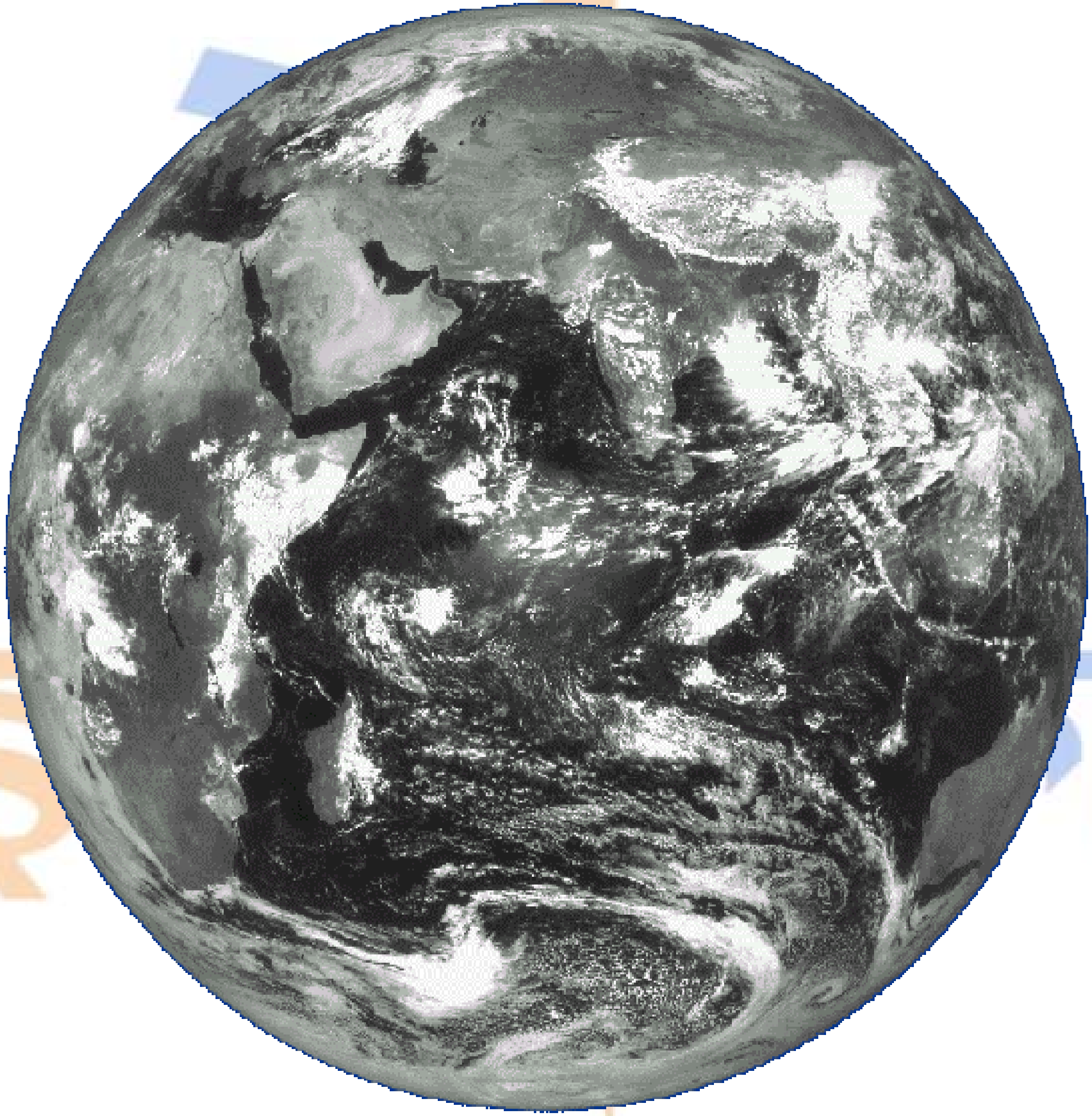
The Seventh flight of PSLV, successfully carried 1055 kg METSAT into Geo-Synchronous Transfer Orbit (GTO)

12 September 2002



First Image from METSAT



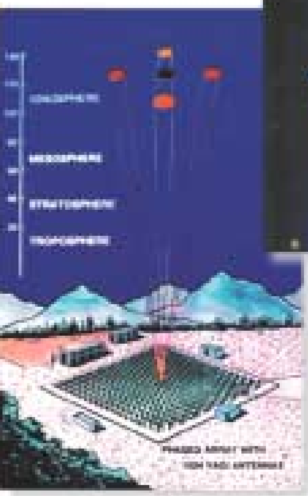


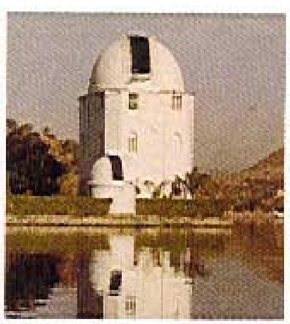
Visible Channel **19th September, 2002**

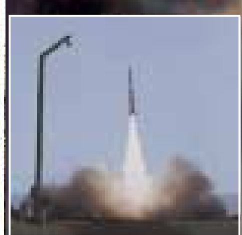
Space Sciences

- **Executive Arms :**
  - **Physical Research Laboratory, Ahmedabad**
  - **Space Physics Laboratory, Trivandrum**
  - **Space Physics Laboratory, Bangalore**
  - **National Mesosphere-Stratosphere-Troposphere Radar Facility, Thirupathi**
- **Universities & Research Institutions under sponsored research program**
- **Research Activities**
  - **Astronomy & Astrophysics**
  - **Planetary Atmosphere & Aeronomy**
  - **Earth Sciences & Solar System**
  - **Theoretical Physics**
- **Space Science Promotion & Cooperation**
- **Joint & Cooperative Science research**
- **ADCOS - reviews & recommends sponsorship**

SPACE SCIENCES

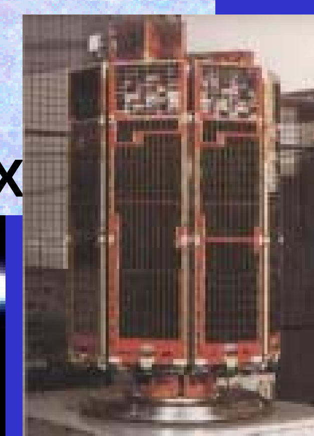






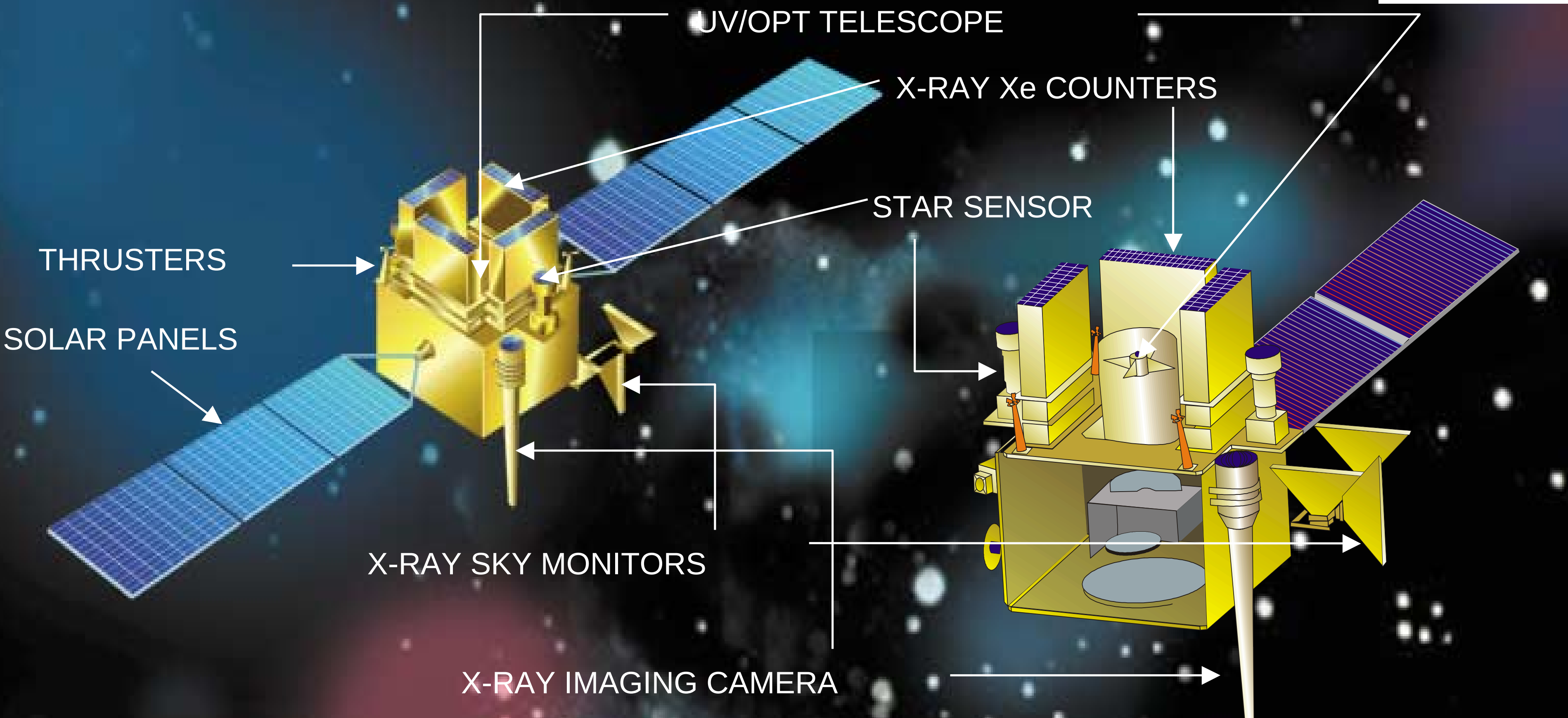
- ATMOSPHERIC RESEARCH
  - NATIONAL MST RADAR
  - LIDAR
  - BALLOON FLIGHTS
  - SOUNDING ROCKETS
- GAMMA RAY DETECTOR AND RPA ON SROSS-C2
- X-RAY ASTRONOMY ON IRS-P3
- GROUND TELESCOPES

PROGRAMMES
- IGBP
- IMAP
- ISTEP
- INDOEX



- ASTRONOMY AND ASTROPHYSICS
- PLANETARY ATMOSPHERES AND AERONOMY
- EARTH & SOLAR SYSTEM SCIENCES
- THEORETICAL PHYSICS

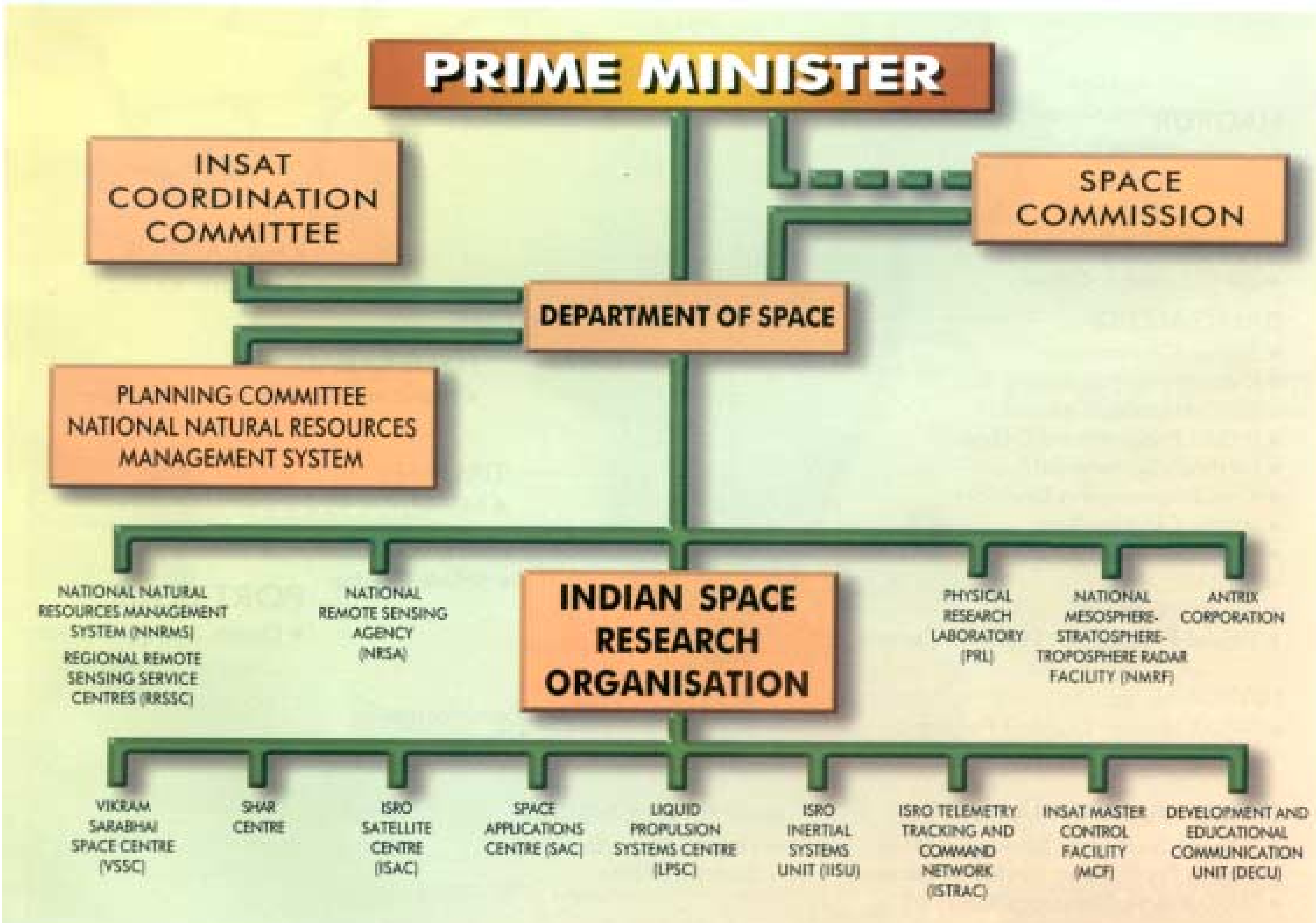
ASTROSAT – FUTURE SPACE SCIENCE



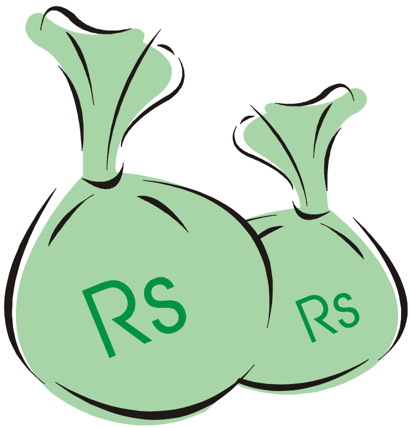
- **XENON FILLED PROPORTIONAL COUNTERS IN ENERGY RANGE OF 3-70 KEV**
- **50- 60CM DIAMETER UV/OPTICAL TELESCOPE**
- **ALL SKY MONITOR IN X-RAY ENERGY RANGE OF 2-10 KEV**

- **X-RAY IMAGING TELESCOPE USING CONICAL FOIL MIRRORS IN THE LOW ENERGY RANGE OF 0.5-5 KEV (FUTURE)**
- **GAMMA RAY TELESCOPE BASED ON SILICON STRIP DETECTOR (SSD) TECHNOLOGY (FUTURE)**

ORGANISATION CHART



BUDGETARY PROCEDURE



Five Year Plans

- Program Level Commitment of Schedule & Funding
- Provides Continuity Over the Annual Budgets
- Permits Adjustments in Annual Plans Based Upon Gap Between Expectations & Performance

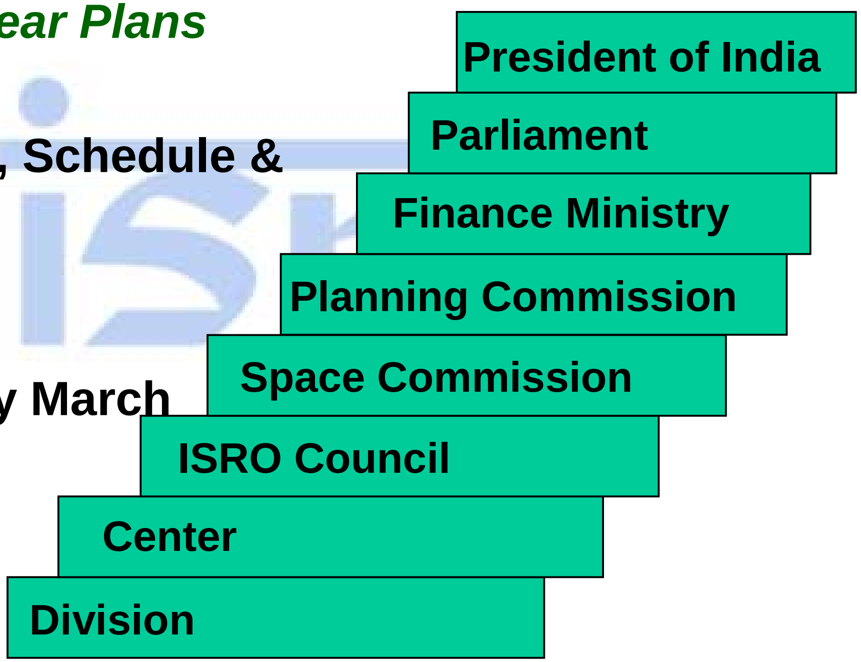
Annual Budget

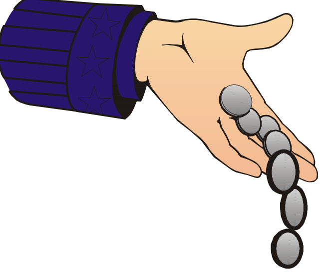
- Parliament Reviews Budget & Performance
- Authorizes Execution of Programs and Spending

10-Year Profiles for Continuity over 5-Year Plans

Budgetary Process

- Grass Root Level definition of Work Plan, Schedule & Funding
- Review, Consolidation & Integration
- Budget Adjustments Moves Downwards
- Process Begins September and closes by March
- Financial Year : April 1 to March 31
- Tenth Plan : 2002-2007



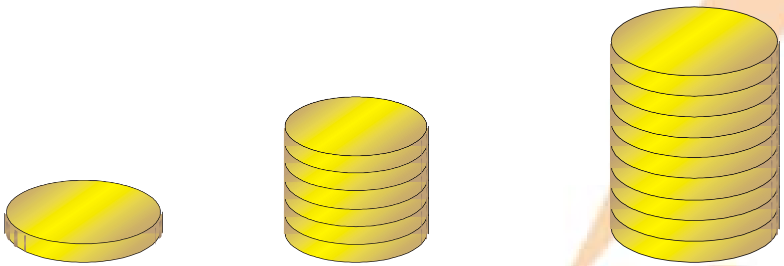


AT WHAT COST?

ISRO SPENT AROUND $ 400 m in 2001-2002

Comparison within India

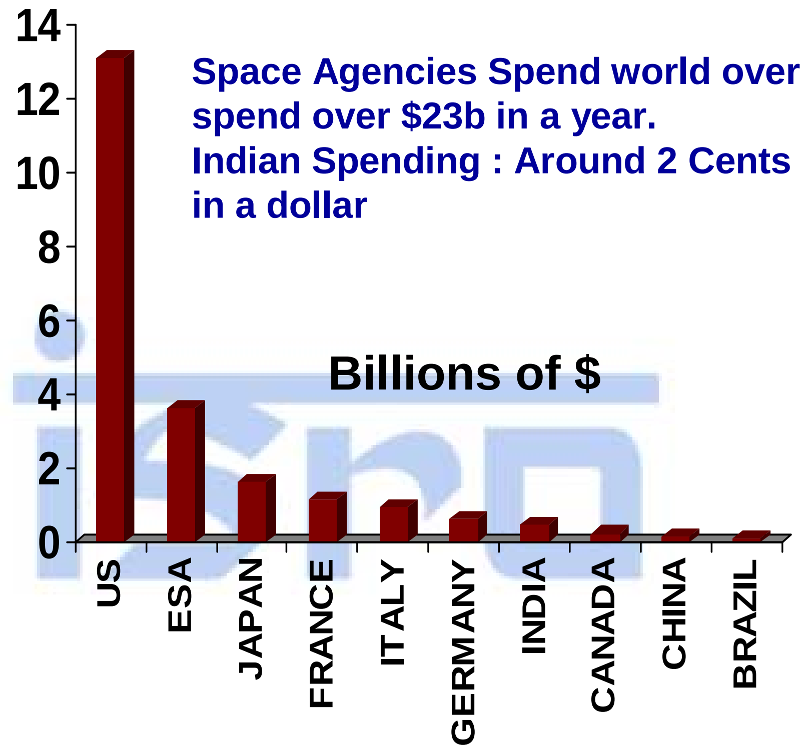
8 cent out of $ 100 GNP



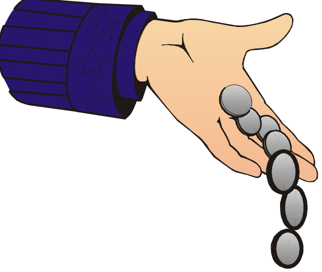
Space **Health Care** **Education**

- A fleet of 5 Geostationary Satellites (INSAT – 2DT; 2E; 3B; 3C; METSAT)
- A fleet of 6 Remote Sensing Satellites (IRS – 1B; 1C; 1D; P3; P4; TES)
- An operational Launcher - PSLV
- A success in the very first flight of GSLV
- End-to-end capability in Remote Sensing arena
- A wide spectrum of applications benefiting the society
- A reasonable success in commercialisation efforts

Comparison with other Space Faring Nations (2001)



Source : World Market Prospects for Public Space Programs by Euroconsult 2002



WHERE DO WE SPEND?

Budget Head	% of Total Expenditure
Rocket Development	39%
Satellite Development	12.7%
Space Applications	7.9%
INSAT Operations	33.2%
Space Science	2.6%
Direction & Administration	4.6%

56.4%

39% on access to space and 56.4% on bringing down benefits of space to earth

- **Remarkable support at all levels – Government, media, law makers & Public**
- **It has not only survived changes in governance but every change has bolstered further national commitment to space**
- **Growing national commitment is reflect in growing budget**

Space Academia Partnership

Objectives

- Utilize the best intellects available within the country
- Help establish centers of excellence
- Nurture a large base of highly skilled manpower to support Space and other national endeavours
- Promote youth participation in frontiers of S & T

Policy

- Generous support to the academic institutions
- Delinking of R&D projects with immediate goals of ISRO
- Duplication of efforts is not necessarily an evil
- Near uniform geographic distribution
- Encouragement of patenting and publications

Space Academia Partnership

Mechanisms

- **Fund R & D Projects**
  - **No. of on going projects :80**
    - **Science 10; Applications 24; Technology 46**
- **No. of academic institutions involved : 40**
- **Manpower : 160**
- **Research Areas Covered : 29**
    - **Science 5; Applications 10; Technology 14**
- **Space Technology Cells**
  - **Premier Institutions such as IITs & IISc**
- **ISRO Chairs (4)**
- **Educational Programmes (3)**
- **Proposals through Announcement of Opportunity**
- **Conference, Symposia & Publications**
- Collaborative Research At National Laboratories / ISRO

Space Projects At Academic Institutions

■ Space Technology Cell

SPACE INDUSTRY POLICY

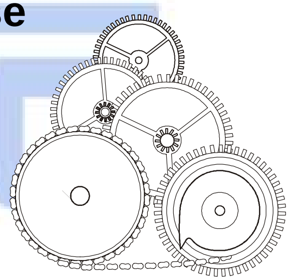
Objectives

- Optimally utilize the capability within the country
- Empower Indian industry with technological wherewithal through Technology Transfer and other support
- Derive cost & time benefits through the strengths of the Indian industry

Our Imperatives

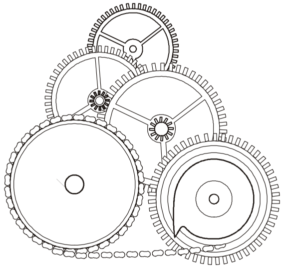
- Enhancements in Needs : 4 to 5 satellites & more than 3 launches / year
- Reduction in manpower
- Maturity of Indian Industry due to ISRO participation and otherwise

Their Imperatives



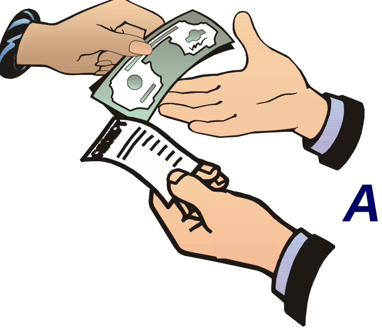
- The urge to enter into new high technological areas
- Expectation of future markets – including international
- Participation benefits them in quality, documentation and confidence
- The prestige associated with ISRO

SPACE INDUSTRY POLICY



Present Policy

- **Realize higher levels of aggregates in system/stage level supply from industry.**
- **Encourage operation of existing facilities by industry either as ISRO owned facility or on transfer basis**
- **Encourage the industry to invest in the future facilities which may be collocated with ISRO facilities for functional efficiency.**
- **Commit the quantity requirements, wherever possible, on a long term basis.**
- **Develop guidelines for the deputation of ISRO experts to industry in consonance with the requirements of TT and quality production.**
- **Stipulate adequate provision to safeguard own IPR and those of the joint developments and security procedures to enforce mutually agreed confidentiality.**
- **Commit Incentives to encourage commercial development of Space System and support services.**



Commercialisation

An Instrument for Socio-Economic Benefit Enhancements

Pre 1992 Scenario

Intense Technology Generation

Enormous Advancement

Fair Share of failures

By 1992

IRS-1A

IRS-1B

INSAT-2A

SLV

ASLV

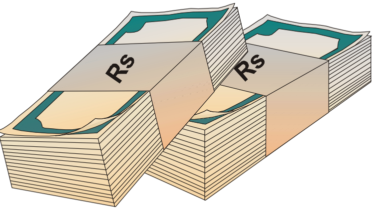
OPERATIONALIZATION OF INDIGENOUS INSAT-2A

&

ASLV LAUNCH SUCCESS

Commercialization of Space : A new dimension to Space Policy

ANTRIX was born



COMMERCIAL ACHIEVEMENTS

High Resolution Imaging

USA, Germany, Japan, Argentina, Thailand, UAE, Myanmar

IRS – P4 : San Diego; Lousianna; Germany; Spain; Korea

Ground Station Support

Lockheed Martin, Hughes Space System, DLR World Space
National Program Office of Taiwan, GE American

In-orbit Test Support in C & W band

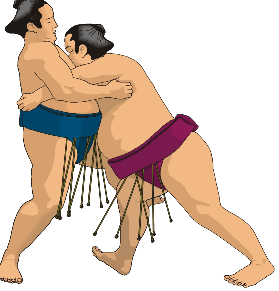
PanAmsat 4 & 7

Partial Lease of INSAT-2E capacity

In spite of failure of INSAT-2D, commitment honoured

Launch Services

KITSAT-3 Korea	TUBSAT Germany	May 26, 1999
PROBA Belgium	BIRD Germany	October 22, 2001



Challenges of Space Commerce

Full commercial potential yet to be realised

Market Protection

Space market not driven by market economy

Foreign policy interests

Market protection under various disguise

Low cost reliable product does not necessarily ensure marketability

National Priorities Vs Commercialization

Only spare capacity to be diverted for Commercialization.

Future Prospects

- **Very soon, national demands are likely to be met releasing more and more resources for commercialization**
- **Partnership with industry to enhance space capability**
- **Attractive pricing & in-orbit delivery**

INTERNATIONAL CO-OPERATION

International Cooperation is implemented as an act of policy for pooling together complementary resources for the collective benefit of the mankind

The Past

- **Establishment & Dedication of Thumba Equatorial Rocket Launching Station (TERLS) to UN**
- **Launching of Aryabhatta & Bhaskara**
- **Manned Space Mission**
- **Many International Payloads on-board Its Sounding Rockets**

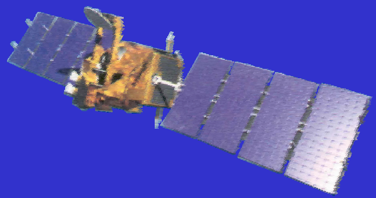
The Policy

- **Mutually beneficial space activities through bilateral programmes**
- **Participate in multi-lateral space frameworks at regional and global level**

The Present

- **Bilateral MOU for Peaceful Uses of Outer Space in Place for 23 Countries**

Megha Tropiques

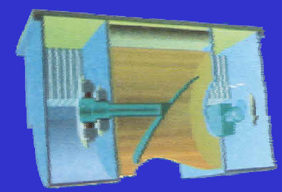


For studying water cycle and energy exchanges in the tropical belt

Low inclination (20º) for frequent simultaneous observations of tropics

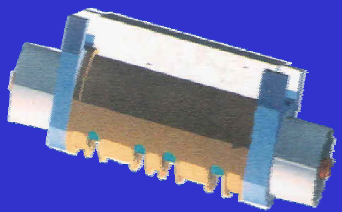
- Water vapour
- Clouds
- Cloud condensed water
- Precipitation
- evaporation

SAPHIR



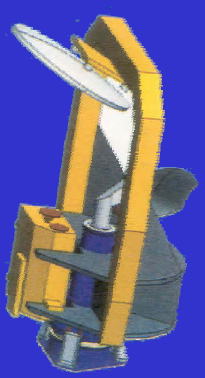
- Water vapour profile
- Six atmospheric layers upto 12 km height
- 10 km Horizontal Resolution

SCARAB



- Outgoing fluxes at TOA
- 40 km Horizontal Resolution

MADRAS



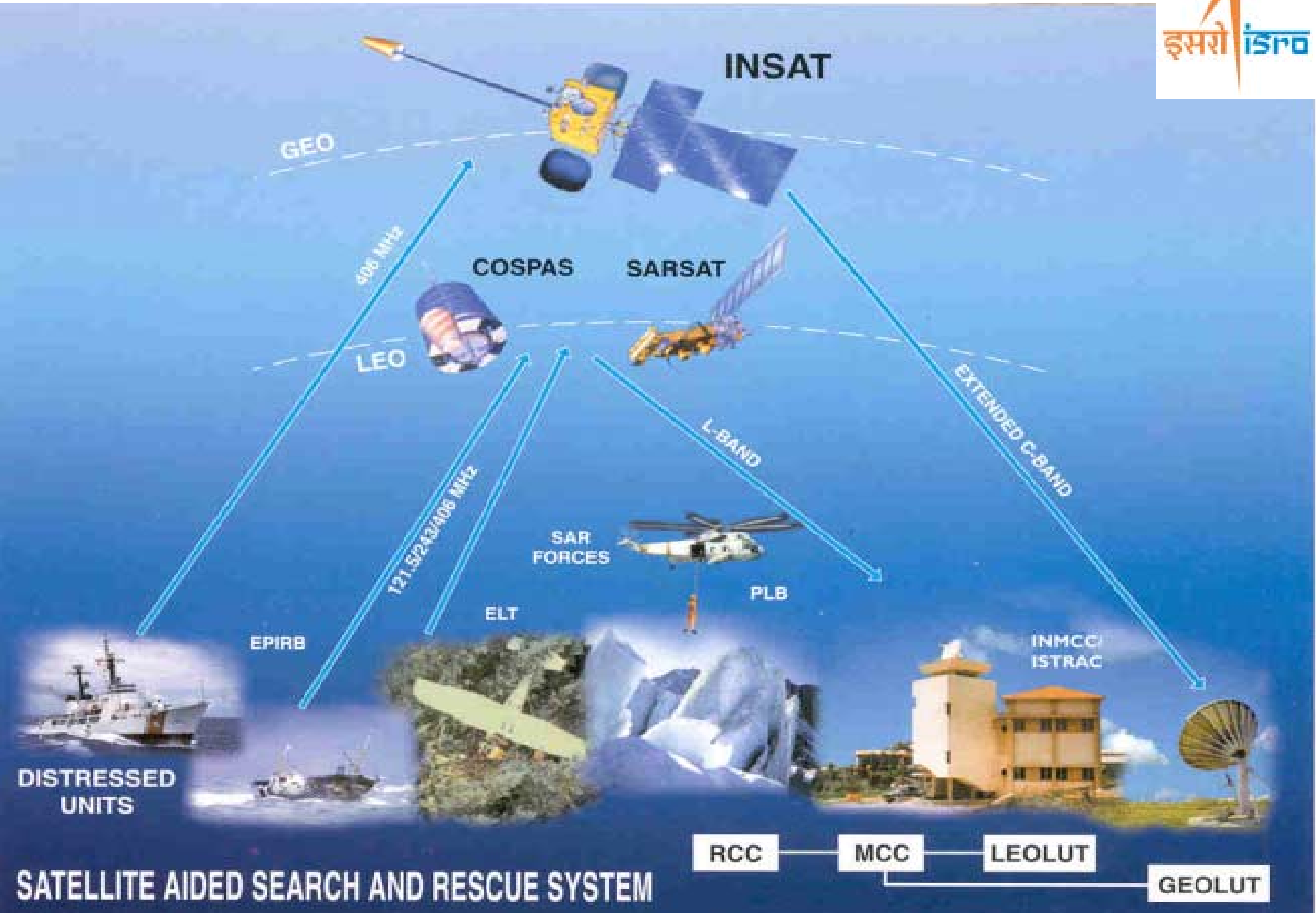
- Precipitation and cloud properties
- 89 &157 GHz : ice particles in cloud tops
- 10, 18 &37 GHz: cloud liquid water and precipitation; sea surface wind speed
- 23 GHz : Integrated water vapour

Likely Participation in Global Precipitation Mission (GPM)

INTERNATIONAL CO-OPERATION

- **Active Participation in UN-COPOUS, CEOS, IAF, COSPAR, IADC, ITU**
- **Center for Space Science Technology Education in Asia-Pacific (CSSTE-AP)**
  - **Set up around IIRS & SAC under UN initiative**
  - **M. Tech. And M. Sc. (Tech) degree in Remote Sensing, GIS, Satellite Communications, Satellite Meteorology, Space Sciences**
- **COSPAR-SARSAT**
  - **Two Local User Terminals (LUT) and Mission Control Center (MCC)**
  - **Real time coverage to Indian Ocean region - Bangladesh, Bhutan, Kenya, Maldives, Nepal, Seychelles, Sumatra, Srilanka, Tanzania, Thailand & Zanzibar**
  - ***Search & Rescue payload on INSAT is the Indian Contribution to complement the low earth orbit system***

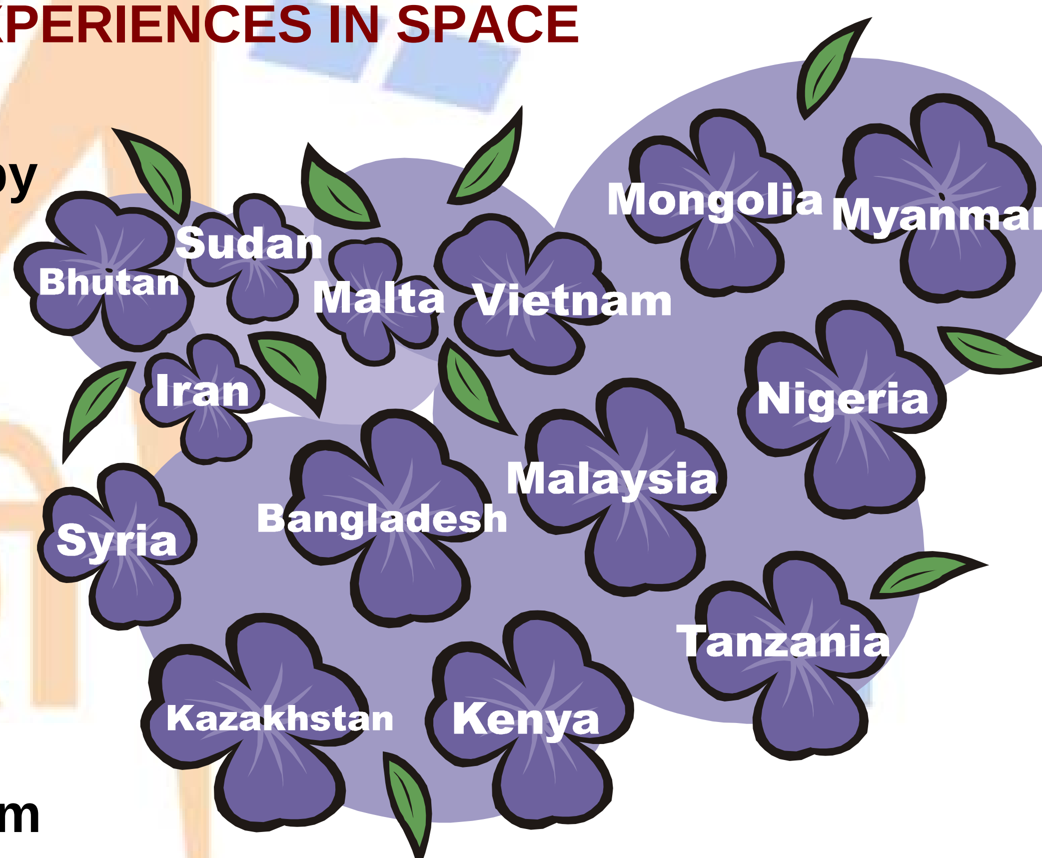
Satellite Aided Search and Rescue System

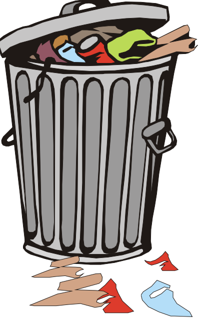


INTERNATIONAL CO-OPERATION

SHARES : SHARING OF EXPERIENCES IN SPACE

- **Indian initiative triggered by the UNISPACE – II (1982)**
- **Training & On-Hand experience in Remote Sensing & Satellite Communications**
- **Extended to participants from developing countries**
- **Around 70 participants from developing countries have benefited**





SPACE DEBRIS

OUR WORDS

- **Space debris deserves serious and urgent attention by one and all**
- **Voluntary adoption of Space Debris Mitigation Guidelines**
- **Sharing of information & technology related to mitigation measures**

OUR DEEDS

- **India PSLV and GSLV designed not to create operational debris**
- **The last stage of GSLV is passivated**
- **Passivation successfully implemented in the last flight of PSLV.**
- **Communication satellites designed with margins for reorbiting to a higher orbit at the end of life. Implemention on a case-to-case basis consistent with national needs**
- **Constructive participation in IADC Space Debris Mitigation Guidelines.**
- ***We host the 21st IADC Meeting in March 2003 at Bangalore, India***

November 2002

	9TH PLAN	10TH PLAN					PART - 11TH PLAN		
MISSIONS	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10
INSAT	3C(P)	3A(P)	3E(P)	4A(P)	4B(P)	4C	4D 4E	4F	4G
TECHNOLOGY/ EXPERIMENTAL	GSAT-1	GSAT-2	GSAT-3	SRE-1	Smallsat GSAT-4	Smallsat SRE-2	GSAT (MKIII)	GSAT ACTS(P)(MKIII)	GSAT (MKIII)
METSAT		METSAT-1		INSAT-3D	METSAT-2			METSAT-3	
IRS	TES	Resourcesat-1	CARTOSAT-1	CARTOSAT-2	RISAT-1	Oceansat-2	Resourcesat-2		RESOURCE-3
SPACE SCIENCE /ENVIRONMENT.		CRABEX / SOX			ASTROSAT	MEGHA-TROPIQUES	Planetary Mission		
PSLV	C3	C5 C4	C6	C7	C8 C9 C10	C12 C11	C14 C13	C15	C16
GSLV – MKI & II	D1	D2	D3	C1	C2	C3	C5 C4	C6	C7
GSLV - MKIII							D1	D2	C1

(P) - PROCURED LAUNCH

MISSION PROFILE 2001-10

RISAT-Radar Imaging Satellite; SRE-Space Capsule Recovery Experiment ; TES-Technology Experiment Satellite ; ACTS-Adv. Communication Tech. Satellite


THANK YOU

International Remote Sensing Law

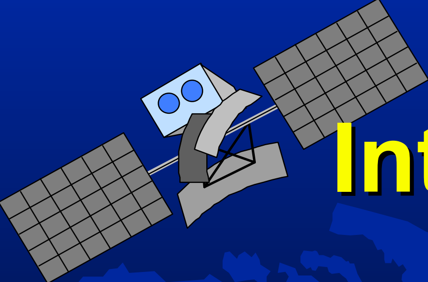
Prof. Joanne Irene Gabrynowicz

National Remote Sensing and Space Law Center

www.spacelaw.olemiss.edu

International Remote Sensing Law

- Arguments, positions and conceptual framework
- U.N. Principles on Remote Sensing
- Customary law?
- Relevant treaty provisions



International Remote Sensing Law
Where Opposites Meet

- Cold War
  - Foreign policy value
  - Government activity
- Post Cold War
  - Economic value
  - Emerging private activity
- Science and technology
- Law and equity
- Space law and Earth law
  - Most important aspect

National REMOTE SENSING and SPACE LAW Center

nternational Remote Sensing Law

- Precursor: 1976 Bogota Declaration
  - Relates to comsats, GEO, and space delimitation issues
  - Not adopted
  - 2001 COPUOS Statement: GEO is space
- Reveals important conceptual framework relevant to remote sensing issues
- Addresses where terrestrial law and space law meet

International Remote Sensing Law and Policy

The Setting

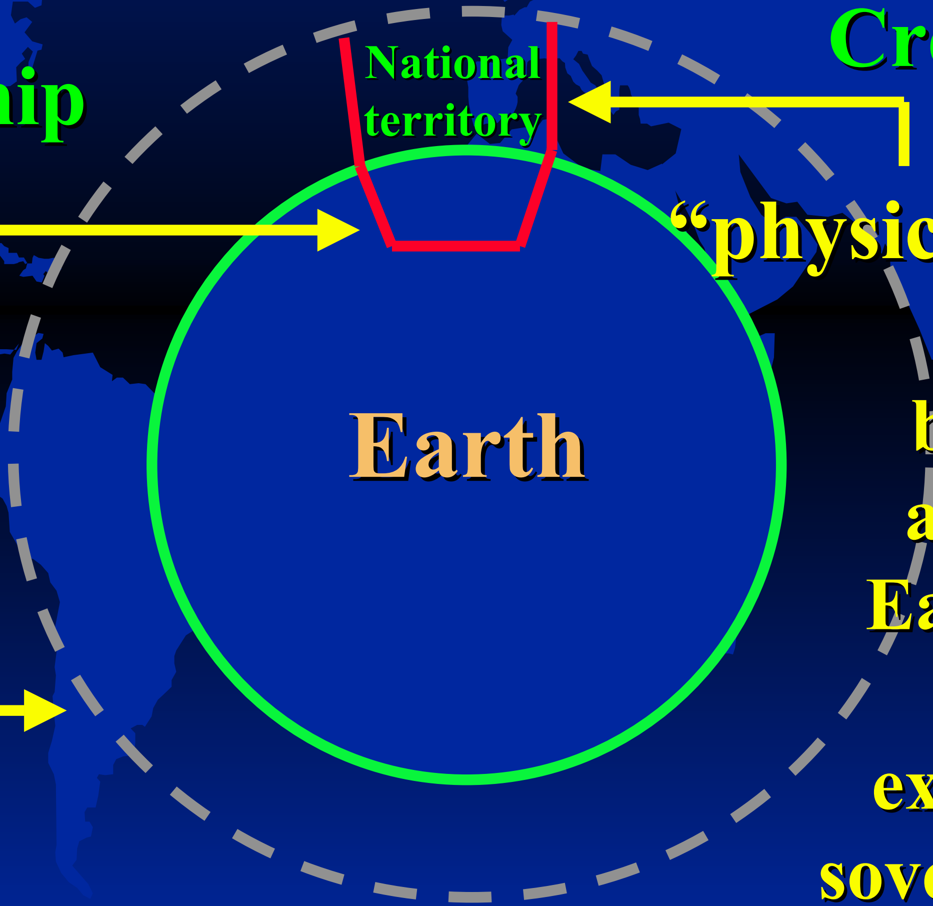
National REMOTE SENSING and SPACE LAW Center

996 - 2002

International Remote Sensing Law and Policy

The Initial Argument

Relationship between GEO



Creates "physical link" and basis for applying Earth law and extending sovereignty

International Remote Sensing Law and Policy

The Counter Argument

Correct relationship is between

"Mass of whole planet"

Earth

"Whole orbit"

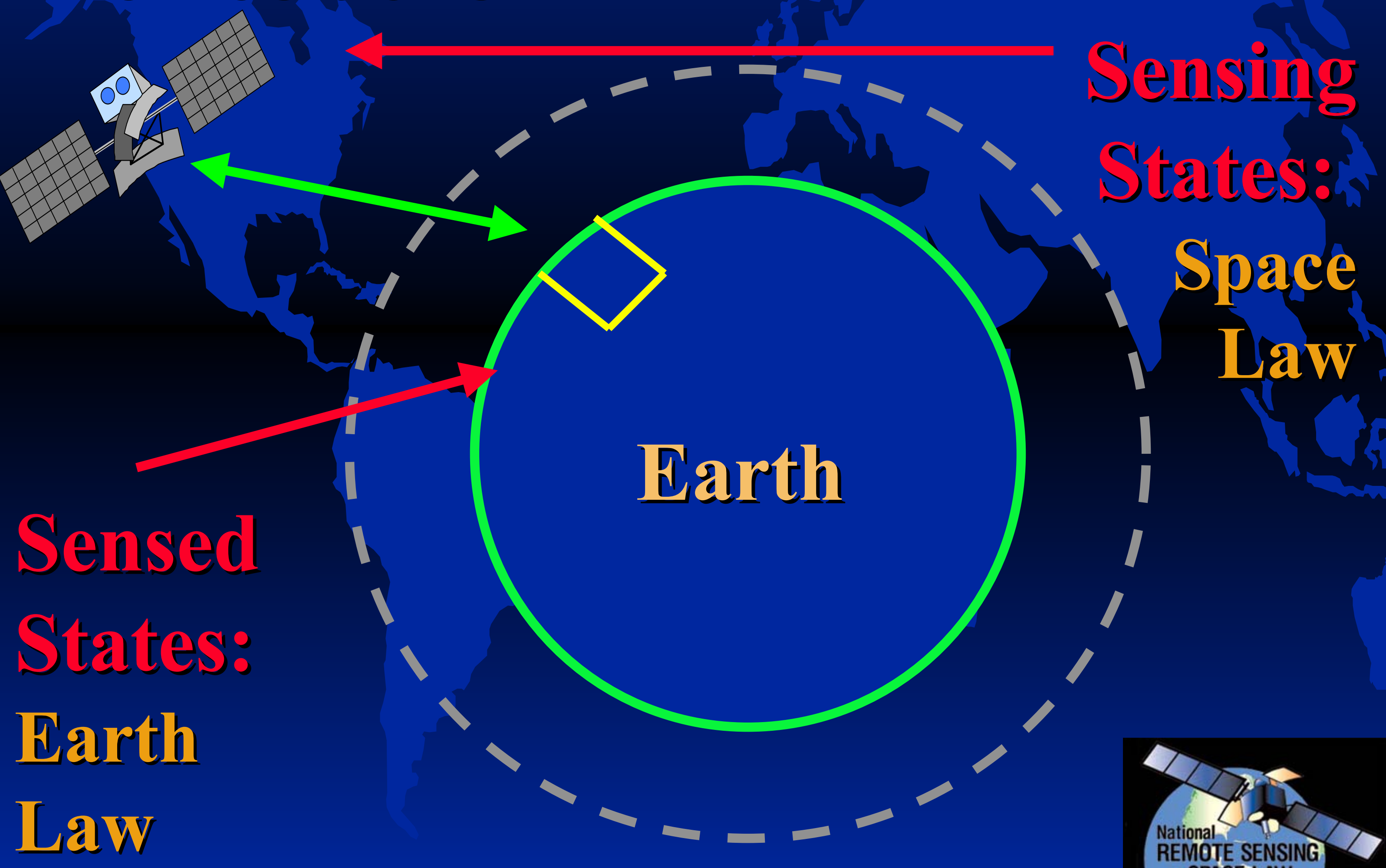
Creates orbits

and basis for applying space law, no sovereignty

National REMOTE SENSING and SPACE LAW Center

International Remote Sensing Law and Policy

The Positions



National REMOTE SENSING and SPACE LAW Center

International Remote Sensing Law and Policy

Concepts Applied to Remote Sensing and LEO

Sensed States:

Earth Law

Nations have sovereignty over territory; permission required to take or distribute images.

International Remote Sensing Law and Policy

Concepts Applied to Remote Sensing and LEO

Sensing States:

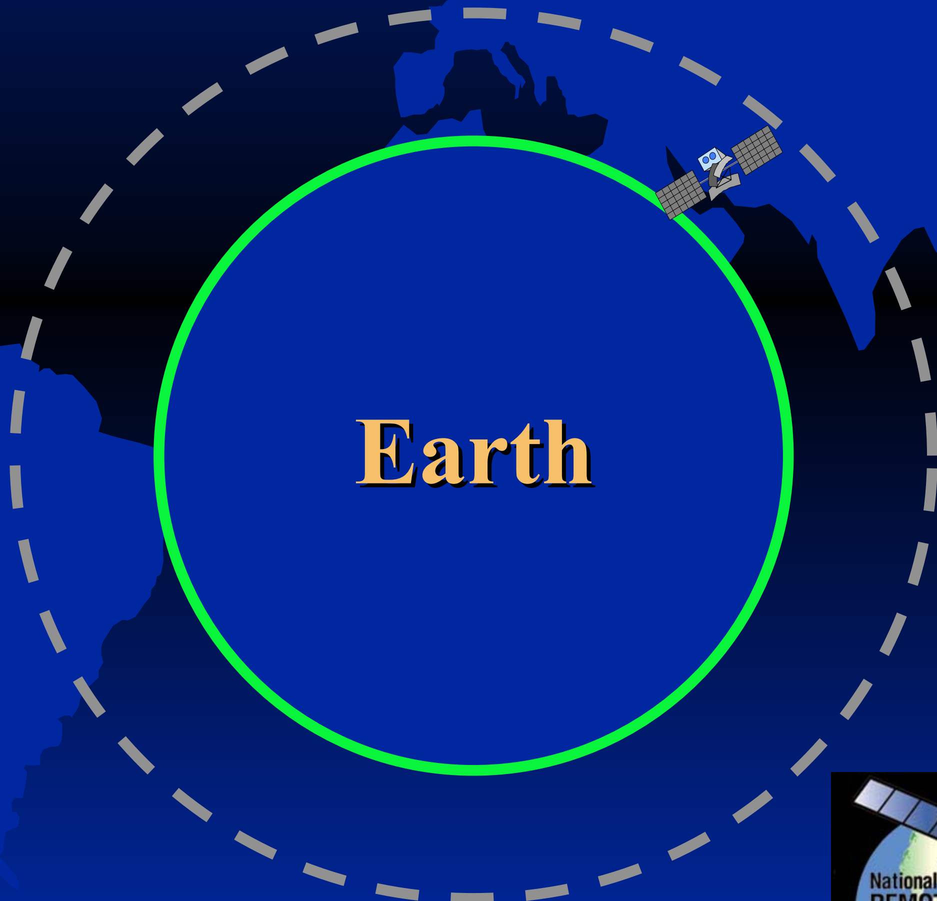
Space Law

Nations have right to "use" space. Remote sensing is a "use." permission unnecessary.

International Remote Sensing Law and Policy

Compromise: Nondiscriminatory access

Sensed States have access to "primary and processed data" from sensing State "on reasonable terms and conditions"and permission not required for overflight or dissemination.



1986 U.N. Remote Sensing Principles

- Addresses access and distribution of data
- Attempts balance between sensed and sensing states
- Based on the space treaties
- Basis for eventual treaty
  - Not currently binding as positivist law
  - Could be customary law
- Best statement of international consensus
  - Persuasive authority

1986 U.N. Remote Sensing Principles

- "Remote sensing means…sensing Earth's surface from space…for purpose of improving natural resources management, land use and protection of environment"
- "Such activities shall not be conducted in a manner detrimental to the legitimate rights and interests of the sensed State." Art. IV.
  - Intended to exclude military systems
  - Prohibits economic espionage

National REMOTE SENSING and SPACE LAW Center

1986 U.N. Remote Sensing Principles

Articles 4 and 12

- Nonexclusive right to use space
- State sovereignty over natural resources
- Sensing state must avoid harm to sensed state
  - "legitimate rights and interests of sensed state"

National REMOTE SENSING and SPACE LAW Center

1986 U.N. Remote Sensing Principles

Articles 4 and 12

- Together, "dissemination statute"
- Primary and processed data
  - Nondiscriminatory access by sensed state on "reasonable cost terms"
- Access to "available" analyzed information
  - If legally unavailable to a state, then unavailable for the *Principles*

1986 U.N. Remote Sensing Principles

Obligation to Disclose

- "Information"
  - To avert "any phenomenon harmful the the Earth's natural environment"
- "Processed data" and "analyzed information"
  - To "promote the protection of mankind from natural disasters"
- Not an obligation to constantly monit

1986 U.N. Remote Sensing Principles

Customary Law?

- Negotiated, developed, implemented and interpreted for more than 25 years
- Incorporated in domestic law and policy
  - Twice by U.S.
  - Canada
  - Japan
- Included in other agreements
  - Radarsat, ERS 1 and 2, etc.

1986 U.N. Remote Sensing Principles

Customary Law?

Nondiscriminatory Access

- Has been most widely accepted and all remote sensing nations affirm the principle, but…..
- Could be changing
  - Many national ground stations ignore it
  - Israel: "black list"
  - U.S.: post 9/11 "denied parties" list
  - India: access based on spatial resolution
  - Canada: Access Control Policy
  - France: access and dissemination control can be activated, at inter-ministerial level, on a case by case

National REMOTE SENSING and SPACE LAW Center

1986 U.N. Remote Sensing Principles

Customary Law?

Nondiscriminatory Access

- Dynamic, important time for this principle
- Need to monitor practice of nations
- Nonetheless, at a minimum, there is a presumption of openness

National REMOTE SENSING and SPACE LAW Center

The Outer Space Treaty and Remote Sensing

- Remote sensing not specifically addressed
- Applicable principles and provisions
- All nations have right to use and explore space
  – Nonexclusive right to use
  – Remote sensing is a “use” with right to acquire data

The Outer Space Treaty and Remote Sensing

- International responsibility of nations for all space activities
  - Legal basis for domestic licensing
- Avoid adverse changes to environment
  - Legal basis for disclosing disaster info gathered by remote sensing
  - Now includes Earth
    - Cosmos 954

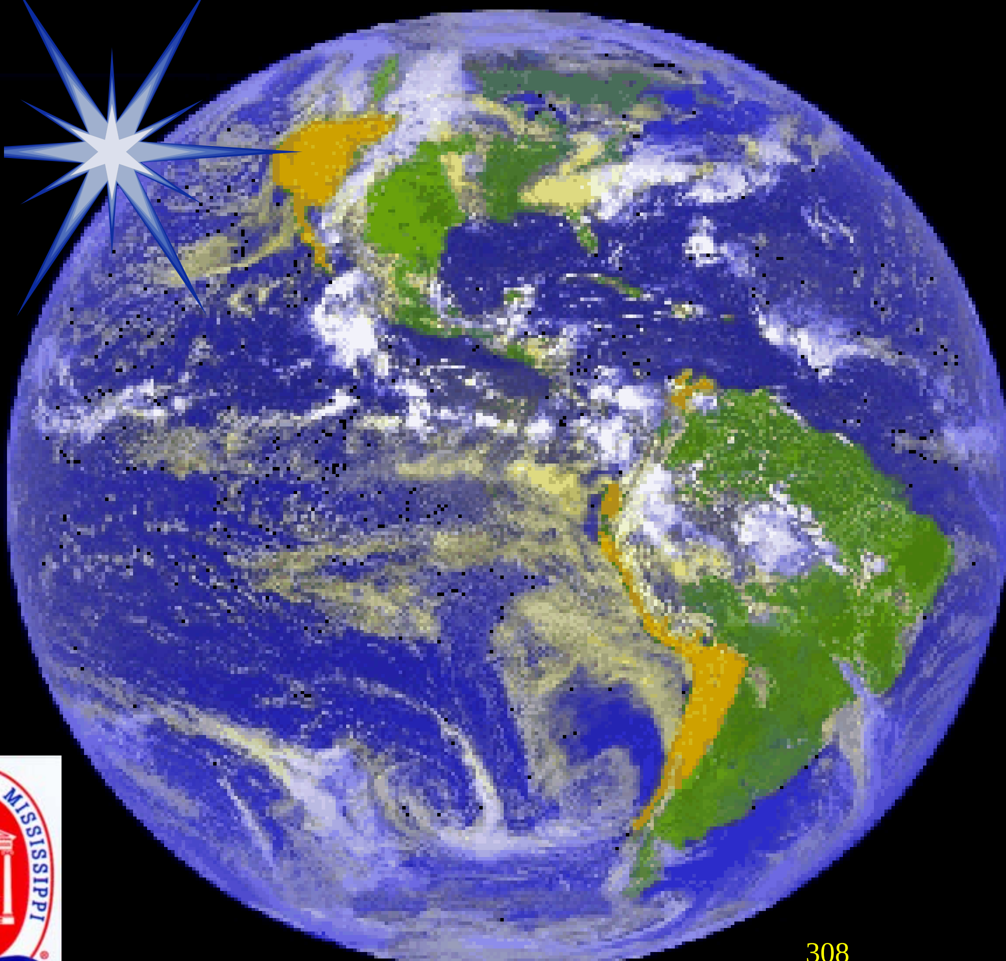
The Liability Convention and Remote Sensing

- Joint and several liability for launching and procuring states
- Negligence and strict liability regimes
- Claims Commission
- First case involved a remote sensing (reconnaissance) satellite
  - Cosmos 954

The Liability Convention and Remote Sensing

- Applies to national and private systems
- Recovery from state, state recovers from private entity
- Contractual allocation of risk for private systems
- Would apply to an intergovernmental consortium

International Remote Sensing Law



Questions?

Comments?

Laws and Policies for Telecommunications

Sa'id Mosteshar

A ENCOURAGING PRIVATE SPACE COMMUNICATIONS

1. GENERAL CONSIDERATIONS

All space communications operators understand the need for regulation of their activity. However, they require a market in which the rules apply equally to all participants and which are not cumbersome or time consuming. Depending on the activity, periods of several months to obtain an operating or service provision licence can be unacceptable. This is particularly so for smaller and less mature markets. Therefore, it is important that States not only establish the appropriate rules, but also ensure their effective, speedy and efficient implementation[1].

Clearly some level of flexibility and market responsiveness is necessary. This is best achieved by a two-tier regulatory regime. Level one establishes the general principles for regulation conforming to the fundamental policies to be implemented. The second tier will comprise licences for individual or classes of activities.

It is often in the interest both of the State and of private operators that competition in the communications market, as in others, be regulated. The State has an interest in ensuring there is a strong operator to provide necessary services at an affordable price to all who need it, irrespective of where they live[2]. The limitation of the number of operators is also important to the State and the operators. It ensures that there is sufficient demand for the services of each operator to attract investment and to create sustainable businesses[3].

2. LEGISLATION

Creation of the conditions for private provision of satellite communication systems and services requires certainty about rules and procedures that will apply to each activity and operator. Participants need to know the scope and limitations on their activities and the opportunities offered in the market.

Domestic legislation will shape the kind of market the State wishes to create. It will address issues such as the types of activities or systems to be permitted and the fundamental factors to be applied in their licensing. The level of foreign participation, the qualifications of licensees and factors relevant to withdrawal of licences will be specified in the legislation.

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1 For example, new Telecommunications Law for Bosnia and Herzegovina stipulates licensing within 2 – 4 months of an application being made.

2 See Section B, Paragraph 3.1.

3 Issuing a Class Licence for two-way satellite services in the UK undermined the businesses of the original six Specialised Satellite Services Operators and slowed market development.

One of the important aspects of the legislation has to be the establishment of the licensing entity, and the definition of its powers and duties.

3. LICENCES

Licences may be granted for the construction and ownership of systems, their operation or the provision of services. In some States a single licence is issued for all of these. Spectrum assignments may be combined with system or service licences, or made separately.

A licence may be required for each discrete kind of activity or system. General licences are frequently issued for communication services that can be conducted without close regulation, specifying the conditions to be present for the application of the licence to an activity or system[4]. Certain activities can be made subject only to notification, with the State reserving the right to restrict their conduct in well-defined circumstances.

The provision of particular types of services or systems often needs to be controlled and regulated and licensed on a case-by-case basis. That is not to say they should be subject to differing licence conditions for identical systems or services; rather, the State may, for example, wish to control the number of satellites with landing rights[5] for the same types of services, to ensure that the market can develop in an orderly and sustainable manner.

As conditions change and the market matures, the licensing authority can revise existing licences to broaden their scope. Clearly, once it has granted a licence for a given period, the authority will be slow to unilaterally limit the scope of the existing licence.

4. REGULATORY AUTHORITY

To encourage private participation in space communications it is not only important to have an independent regulatory authority, but that it is seen as such. If the government retains any interest in the national public telecommunications operator, PTO, it becomes even more critical that the implementation and enforcement of regulation be transferred to an agency independent of the government and of the PTO. This applies equally to the body responsible for spectrum management.

Often the necessary expertise for efficient running of a regulatory agency is concentrated in the PTO or communications ministry. The transfer of such expertise to the regulatory agency is a delicate process. Transparency in regulation of the market and in licensing is needed to reassure private sector participants that preference is not being given to any one operator.

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4 For example, a General Licence can permit the operation of a receive-only earth station, with the condition that it receives transmissions only from authorised satellites.

5 For *Landing Rights*, see Section B, Paragraph 1.1.

Whether one agency deals with both spectrum and operating licences is a matter of preference for the government[6]. If broadcasting and telecommunications are dealt with by separate agencies, it may make sense to have a third agency to handle spectrum management for both activities. Private operators prefer to have one point of contact for their regulatory obligations and to minimise form-filling and application processes. Therefore, they are likely to favour a single agency.

The cost of regulation and enforcement is usually recovered through licence fees. Most regulatory agencies charge initial fees for each licence or assignment, combined with annual charges. Such charges are intended to recover the cost of operating the regulatory agency or agencies. Part of the cost of running the regulatory body is associated with monitoring the activities of operators and enforcing the law, including licence conditions. Obviously, there is a base cost associated with licensing and enforcement activities, with a variable element linked to the number of operators in the market.

5. ROLE OF SIGNATORY

Historically, access to space segment capacity of international satellite organisations such as INTELSAT, INMARSAT and EUTELSAT, was only through the Signatory of these organisations, typically the PTO, which had exclusive access to the space segment capacity. With the advent of direct access, enabling non-signatories or members of these organisations to access capacity directly, the Signatory no longer plays a central role in accessing space segment capacity by non-members.

However, it is worth noting that should there be exclusivity of access to space capacity through one entity only [7], such entity should be non-operating and independent of any operator. There will typically be a requirement that capacity be allocated on a non-discriminatory basis.

B POLICY AND REGULATORY CONSIDERATIONS

The object of regulation is to ensure interoperability, and to avoid harmful interference, to promote economic development, and to safeguard national interests, including social and cultural. Regulation is instituted in the context of and in conformity with international rules and obligations.

1. REGULATION OF SYSTEM

1.1 Space Segment

There are two distinct parts of a satellite communication system susceptible to government regulation. They comprise the satellite network itself, including its tracking, telemetry and control (TT&C) ("*Space Segment*"), and the terrestrial

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6 In the UK two separate agencies, the DTI (with OFTEL advice) issues licences and the Radiocommunications Agency deals with frequency assignments. In the US the FCC deals with both.

7 Such rules may exist in respect of regional satellite systems.

infrastructure directly communicating with the satellite, consisting of dish antennae, receive and transmit equipment[8] ("*Earth Segment*").

A State can only regulate systems and activities within its jurisdiction. Satellites are outside the territory, and often, the jurisdiction of the State[9]. Unless the State is a *Launching State*[10] and the registrant of the satellite, there is generally no jurisdiction over the system or the satellite operating entity.

Where there is such jurisdiction, the regulating government can affect the international conduct of communications, for example by stipulating the services to be provided and, of course, the part of the spectrum to be used[11]. If the only connection with a jurisdiction is the presence of the TT&C in its territory, there will be some scope for regulation, but it will be limited under many of the laws governing such activity. This is principally because the TT&C transmissions are not provided to the public.

The satellite operator generally does not provide telecommunication services, but the means for providing those services. Even so, it is not free of the need to obtain authorisation from different States for its activities. To market its services in each State the satellite operator must be able to have the satellite signals received in the relevant territory. The rights to do so, *Landing Rights*, are regulated under the laws of each State in which the signals are to be used for telecommunication services. In deciding whether to grant Landing Rights to a particular satellite system, the State will consider the need to protect its own national provider and the effect of the new system on the market, both for systems and the services which can be provided over the systems.

Nevertheless, the most effective and common regulation of the *system* is through licensing and authorisation schemes aimed at the *Earth Segment*, discussed below. The opportunity to regulate the *Space Segment* of satellite systems and the impact of regulation are limited.

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8 This includes satellite dishes, other antennae, handsets such as direct to satellite mobile telephones of the kind used by Iridium and others.

9 Jurisdiction and control over the satellite is reserved to the State on whose registry the satellite is carried, *Outer Space Treaty of 1967*, Article VIII; *Registration Convention of 1975*, Articles I & II. Further, under the *Outer Space Treaty of 1967*, Article VI, each Party to the Treaty takes responsibility for and must authorise and supervise the activities of its nationals in outer space. To satisfy this obligation, Parties to the Treaty impose licensing requirements on space activities. This is separate from regulation relating to telecommunications activities. Some States, such as the UK, regulate all space activities under space legislation; others, like Australia, only regulate launch activities under their space legislation, regulating space aspects of other activities, such as telecommunications, under legislation governing those activities.

10 As defined in the *Outer Space Treaty of 1967*, the *1972 Liability Convention* and other space treaties. The majority of satellite systems providing international communication services are US owned and operated. However, there is increasing participation by entities of other States.

11 Regulation of services and spectrum management are subject to the over-riding international rules and regulations of the ITU.

1.2 Landing Rights

Control over Landing Rights provides States with a means to regulate competition, and safeguard their economic and cultural interests. Under the WTO Telecommunications Annex, satellite services can be excluded from the requirement to open the market to foreign operators. Many States that ratified the Annex made reservations in relation to satellites[12].

The Landing Right regime is further implemented through earth station licensing. These licences will specify that earth stations can only be connected with authorised satellites, namely those granted Landing Rights.

1.3 Liability Issues

States bear international responsibility and liability for national space activities[13]. They pass-on these liabilities to private entities conducting space activities, such as operating communication satellites[14]. Although the liability of the State is unlimited, to pass-on such liability to private entities can discourage their participation in satellite communications. Some States will limit the liability of the private entity to encourage investment in the satellite sector[15].

1.4 Earth Segment

Considerations relevant to regulation of the Earth Segment are largely similar to those applicable to terrestrial wireless systems. The main distinction is the connection between the Earth Segment and the Space Segment.

In most States the licensing regime regulates the operation or *running* [16] of telecommunication systems or the provision of telecommunications services. Some regimes require authorisation of construction and ownership of the system. But whatever means are used by a State to restrict or control communications activities, the scope of regulation does not extend beyond the jurisdiction of the State. Therefore, the State will normally only regulate activities that take place or systems that are located within its territory[17].

Regulation is effected through licensing. There are two types of licence, individual and general or class licences. Individual licences are given for larger systems where the State intends to control operation of the system, for example to mandate interconnection

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12 Patrick-André Salin, *Satellite Communications Regulations in the 21st Century*, Martinus Nijhoff, 2000, p 83.

13 For a discussion of the nature of such liability see Sa'id Mosteshar, *International Liability For Damage: Proposed Solutions for the Era of Commercial Space Activity*, in Liber Amicorum for Karl-Heinz Boeckstiegel, ZLW, 2001.

14 *Outer Space Treaty of 1967*, Articles VI & VII; *Liability Convention of 1972*, Article I.

15 The UK probably has the worst liability regime in this respect. The US limits private liability.

16 In the United Kingdom see *Telecommunications Act 1984*, Section 5(1).

17 See Paragraph 1.1 above.

with other networks, stipulate price limits or to limit the number of systems. Class Licences[18] apply to defined types of satellite systems, for example receive-only earth stations or VSATs[19]. The primary purpose of Class Licences is to liberalise the operation of categories or types of system, which do not present any regulatory concerns and the use of which the State wishes to promote.

Class Licences authorise connections between the licensed system and *some* satellites that meet certain conditions[20]. The main conditions are that the satellite meets the technical co-ordination requirements of international satellite organisations and the technical and service limitations specified by the licence. In addition, States will generally reserve the right to withdraw the licence in relation to specified satellites[21]. Withdrawal of a licence would pose both political difficulties and enforcement concerns. Governments are reluctant to take steps that are seen as inconsistent with their declared policy for telecommunications, or which are difficult to enforce. Nevertheless, the power to withdraw is important for ensuring satellite operators continue to meet technical standards and international obligations, as well as their licence conditions.

It is theoretically possible to enforce the regulations of a State by ensuring that an unauthorised system cannot provide service within the jurisdiction of that State. But to do so would require the co-operation of the operator of the satellite communications system, assuming such measure is technically feasible.

1.5 Type Approval

States have a legitimate interest in ensuring that earth stations and other telecommunications equipment meet appropriate technical and electromagnetic emission standards. All States have such type approval procedures, which may include self-certification by manufacturers. Wherever possible it is desirable to extend recognition to international or regional standards and approvals, so as to ease the burden on operators.

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18 See for example the United Kingdom, *Class Licence to Run Telecommunication Systems for the Provision of Satellite Telecommunication Services*, 2 August 1991, *Satellite Services Licence.*

19 Very small aperture terminals, i.e. small satellite dishes.

20 In the United Kingdom see *Satellite Services Licence, Schedule 3, paragraph 2 (ii).*

21 This is to ensure that a satellite that ceases to conform to the qualifying conditions can no longer be connected to the relevant telecommunications system. See the United Kingdom *Satellite Services Licence, Schedule 3, paragraph 2 (ii.cc).*

2. SPECTRUM MANAGEMENT

States have an international obligation[22] and a national interest in ensuring that radio frequencies are efficiently used and that their use does not cause harmful interference between systems. The same considerations apply to frequency assignments for satellite services as to terrestrial systems. However, the fact that satellites are in space and that their transmission footprints often span more than one State presents some additional issues.

2.1 Domestic Satellites

Some satellite systems transmit to only one State and are for domestic use within the State of registration, giving the State jurisdiction over the satellite[23].

In these cases the State has more scope than in the case of international satellite services to determine the frequency policy and assignments[24]. Many governments advocate or have instituted spectrum pricing as a means of achieving spectrum use efficiency. The underlying premise is that by charging an "appropriate" fee for spectrum, entities will be given the incentive to make better use of spectrum in bands where there is strong demand. This approach has been applied to domestic satellite systems, but not yet to international systems[25].

2.2 International Satellites

The orbital and frequency assignments to an international satellite affect not just communications within the assigning State, but in all States in which the satellite provides communication services. The majority of communication satellites are authorised and licensed by the Federal Communications Commission of the United States, *FCC*. However, their services are provided across the world. In effect the exercise of jurisdiction by the FCC limits the licensing authority of the individual States involved; at least in so far as the space segment is concerned. But the licensing State's obligation to co-ordinate with other affected States[26] gives those States an opportunity to influence the spectrum assignment for the international satellite.

The obligation to co-ordinate makes it more difficult for the licensing authority granting authorisation to pursue entirely national interests. Some have argued that auctioning spectrum and orbital slots is contrary to the *Outer Space Treaty*[27], to the extent that it

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22 Under the ITU *Radio Regulations*.

23 For example, *EchoStar VII*, serving the United States has a footprint extending to Continental U.S., Hawaii, Alaska and Puerto Rico.

24 This is subject to the requirements of the ITU and the international spectrum regime.

25 Mexico is an example of a State that has auctioned satellite spectrum for its domestic satellites. It has refused to rule out its application to international systems.

26 *ITU Radio Regulations*.

27 *Outer Space Treaty*, Articles I and II.

takes a space resource for the benefit of the authorising State alone[28]. Furthermore, from a commercial perspective, it is difficult to justify auctioning a right to operate in markets over which the authorising agency has no jurisdiction or control.

3. REGULATION OF SERVICES

Most States, if not all, make distinctions in the way they regulate different communication services. Data is usually less strictly regulated than voice telephony. Pure transport, i.e. *simple resale* of capacity, is also distinguished from value-added or enhanced services. Many of the regulatory considerations in this area are governed by the level of protection given to the incumbent national public telecommunication (or broadcasting) organisation, *PTO*.

3.1 By-pass

The advantages of satellite communications over terrestrial systems include the speed and cost efficiency of constructing a space-based infrastructure. However, the ability of satellites to by-pass the terrestrial network, particularly in lucrative international services, has an impact on the telecommunications market.

The use of a two-way (send and receive) earth station at each end of a telecommunications system permits operators to carry traffic between those points without recourse to the PTO network. The ability to by-pass part of the PTO network in this way is greatly increased if the operator also connects the earth stations to PTO networks at each end.

The State may wish to protect an incumbent PTO's monopoly or market advantage by preventing by-pass. In a competitive market this may still be desirable to ensure sufficient resources for the PTO to provide universal service and continue to be subject to price restrictions.

Therefore, at least at the early stages of re-regulation toward a competitive market, by-pass can be prevented by restriction of two-way systems, or limiting connection to the PTO network, the public switched telecommunication network or *PSTN*[29]. It is also possible to prevent by-pass by regulating ways in which messages can be carried.

3.2 Voice and Data Services

Digital communications has made the distinction between voice and data more theoretical than technically manifest. Nevertheless, even in well-developed economies, voice constitutes the significant part of traffic handled by carriers,

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[28] A full discussion of these issues is beyond the scope of this paper, but see Carl Q Christol, Space Law: Past, Present and Future, 1991, in particular *National Claims for the Using/Sharing of the Orbital/Spectrum Resource*, p 97; and *The Sharing of Access and Resources by States of Varying Capacities*, p 289; Patrick-André Salin, *Satellite Communications Regulations in the 21st Century*, Martinus Nijhoff, 2000, pp 16-22.

[29] Many States, including the UK, opted for both types of control when they first liberalised their telecommunications markets.

particularly the PTOs[30]. Voice also has a particular significance for low income and rural residents. Universal service requirements apply primarily to voice services[31]. Therefore, it can be appropriate to regulate voice services differently from data services.

As already mentioned[32], simple carriage of a data message over a network is distinct from the provision of additional services, adding value to the basic data message. Value-added services range from storage, to the combination of the original message with other data.

The distinction between voice, data and value-added services does not apply uniquely to satellite services. However, it has an impact on the treatment of one-way and two-way services.

3.3 One-way and Two-way Services

A distinct advantage of satellite communications systems over terrestrial systems is the capability to broadcast the same message over the whole of the satellite footprint to multiple earth stations, cheaply and efficiently. Efficiencies that can be achieved through such broadcast services are generally deemed to be economically desirable and are encouraged by many States. These services include up-dating inventories, reporting sales revenues, circulating news and messages to staff and installing new titles in jukeboxes[33].

To take advantage of these benefits, many jurisdictions have introduced class licences for receive-only earth stations. The class licences require that the earth stations conform to relevant technical standards and that they are used for permissible purposes.

Two-way services have a greater potential for replacing terrestrial equivalents[34]. Additional considerations arise if the satellite system is non-domestic. In that event, part of the revenue from the provision of services will go to entities outside the State in which the service is provided, with a loss of both foreign exchange and tax revenue.

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30 In the UK BT provides the vast majority of last mile connections, particularly in the residential market.

31 In the US there has been argument for the application of universal service principles to Internet access. Not surprisingly, this has been largely motivated by commercial interests and is in part a product of the manner of application of universal service requirements in the US.

32 See *Paragraph 3*.

33 Closed user groups and communications for the internal purposes of an entity are subject to little regulation. These activities are diverse and encouraged by governments as they contribute to business efficiency.

34 See *Paragraphs 3.1 and 3.2*.

4. REGULATION OF CONTENT

Naturally, States have an interest in maintaining the national identity, characteristics and values of their citizens. There is also a desire to encourage and support domestic industry. These considerations are more relevant in the broadcasting sector than in carriage of telecommunications traffic, although, the latter is not entirely free of content regulation. Content regulations applicable to telecommunication services range from libel laws to prohibition of obscene or threatening communication. The protection of children is of particular concern in the regulation of Internet services.

The nature and source of broadcast programming has been subjected to varying rules and regulations. Some States set targets for domestically produced programming[35]. Pornography and obscenity, violence and other sensitive programming is generally prohibited.

Regulation of direct-to-home satellite broadcasting requires the determination of the place where the broadcast is made and what activity is regulated. The domestic laws of the State involved will determine these issues. It is necessary to avoid laws that deem the relevant activity as taking place at the satellite. In such event jurisdictional issues will arise, and the activity to be controlled may escape regulation[36].

5. PLANNING LAW

Installation of earth stations falls under the rules governing land development and construction of structures. These planning or zoning laws are enforced by local government authorities, not always consistently. The need for planning permission from the local authorities gives them powers over satellite services and creates variations across a State, not always consistent with national government policy. This variation makes the establishment of a national satellite network cumbersome and slow.

In addition, local planning authorities in some States have become increasingly concerned about radiation hazards[37]. Therefore, it is not surprising that they take a conservative approach to the issue.

To implement national policies and to speed the establishment of networks, general exemptions are given for certain types of installation. Most commonly, receive-only earth stations of a certain size[38] are exempt from planning regulations and requirement.

Some States go further to encourage the market in satellite services, by also stipulating terms for installations on private property[39].

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35 For example, France prohibited satellite broadcast of the Cartoon Channel, on the basis that it did not meet the requirements for domestic origin programming.

36 Sa'id Mosteshar, *Satellite and Cable Television: International Protection*, Oyez, 1984.

37 Typical among these are planning authorities of Swiss Cantons. The potential hazard does not always appear to be supported by the available research

38 These can be up to 120 centimetres in diameter, but more often 90 centimetres.

39 See for example the UK *Telecommunications Act 1984*, Schedule 2.

6. OTHER MARKET REGULATION

6.1 Preference for Domestic Satellites

States with their own domestic satellites have an interest in encouraging the use of them in preference to other systems. They implement this policy through control of Landing Rights for non-domestic satellites and by requiring service providers to use the domestic system where available[40]. This requirement that service providers prefer a domestic satellite is more difficult to enforce. In determining the desirability of preferences, States will weigh the national interest in creating a healthy and well-priced satellite market against the protection of domestic suppliers.

6.2 Foreign Investment

Desirable as foreign investment may be, States are sensitive about control of their means of communications by foreign interests. Therefore, many States place limits on the level of ownership by foreign investors in different means of communications.

7. SUMMARY

In conclusion, although the factors discussed here are not comprehensive, they do represent some of the important considerations in determining policies to attract private participation in space communications. The following is a summary of these elements.

7.1 Policy Considerations

1. Establishment of modern infrastructure at little public cost[41]
2. System Interoperability - Technical Standards
3. Electromagnetic radiation control
4. Spectrum Management and prevention of harmful interference
5. Orderly development of competitive market
6. Safeguarding viability of incumbent PTO
7. Universal service goals
8. Safeguarding national industry
9. Protecting national culture and society
10. Protecting national security

[40] Mexico is an example of a State using both methods of control.

[41] ITU Convention, Article 44, requires States to use the latest available technology.

7.2 Conditions for Encouraging Private Space Communications

1. Certainty of rules
2. Efficient and speedy processing of Licence Applications
3. Market stability
4. Sufficient period to recover investment
5. Interconnection to other networks
6. Effective regulation of errant competitors

United Nations and
International Institute of Air and Space Law

Workshop on

Capacity Building in Space Law

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Laws and Policies for Telecommunications

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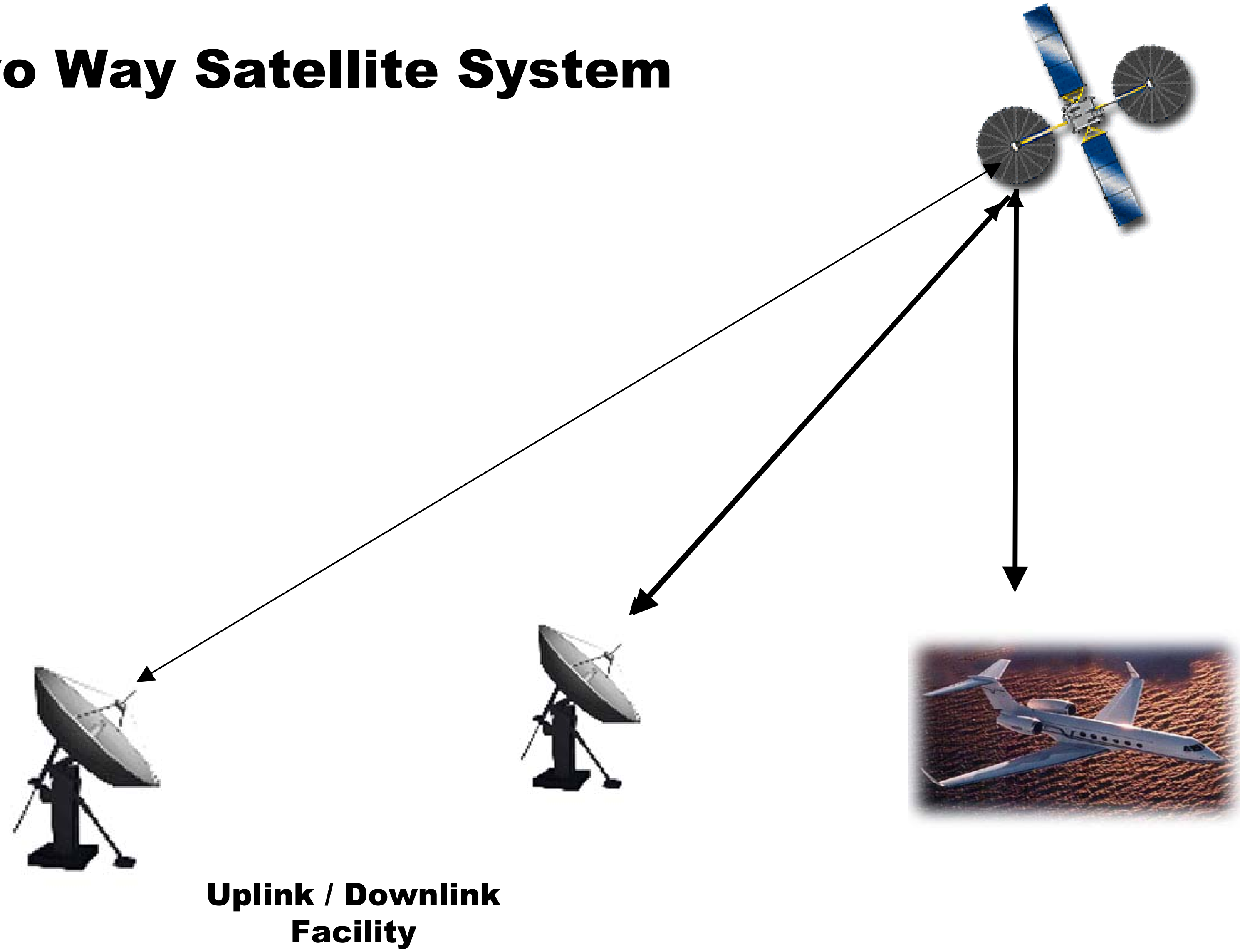
Characteristics of Satellite Communications

1. Location in outer space outside territorial jurisdiction
2. Speed of construction
3. Ability to span large areas and two or more countries
4. Capability to access stations over the whole foot-print
5. Ability to be connected to fixed or mobile stations
6. Can be used to broadcast or provide two-way connections
7. Can be linked to and provide connections to terrestrial networks

Two Way Satellite System



Encouraging Private Space Communications

Government Objectives

1	Construction of modern infrastructure
2	Lower prices for business and residential users
3	Generation of economic activity
4	Increasing efficiency of domestic industry

Encouraging Private Space Communications

Private Sector Needs

1	Certainty of rules
2	Efficient and speedy processing of License Applications
3	Market stability
4	Sufficient period to recover investment
5	Interconnection to other networks
6	Effective regulation of errant competitors

Encouraging Private Space Communications

Conditions for Achieving Objectives

1 System of laws and licensing

Landing Rights
Distinguish Space Segment and Earth Segment

2 Legislation

Specify activities subject to regulation
Establish licensing regime
Regulatory Authority and its powers and duties

3 Licensing regime

Individual and Class Licenses
Terms and conditions for conduct of activity

4 Administration of regime

Regulatory Authority and Spectrum Management
Signatory role

Policy and Regulatory Considerations

Policy aims of Regulation

1	Ensure System Interoperability - Technical Standards
2	Electromagnetic radiation control
3	Spectrum Management and to Prevent harmful interference
4	Secure orderly development of competitive market
5	Safeguard viability of incumbent PTO
6	Achieve universal service goals
7	Safeguard national industry
8	Protect national culture and society
9	Protect national security

Policy and Regulatory Considerations

Licensing Regime

1 Distinguish

Spectrum
System
Service
Content

2 Spectrum
Manage for Efficient Use and Avoidance of Interference

National and International Regulations
Domestic and International Satellites

3 System
Technical compliance, Interconnection and Coverage

Space Segment and TT&C
Earth Segment

Policy and Regulatory Considerations

Licensing Regime

4 **Service**
Determine level, nature of activities and viable entities

- By-pass
- Voice & Data
- One-way and Two-way

5 **Content**
Protect Society, Children, Individuals, Culture and Industry

- Violence & Obscenity
- Racial, Religious and Ethnic Hatred
- Defamation & Privacy
- Domestic quota

Policy and Regulatory Considerations

Other Controls

1 Planning
Create Certainty and Uniformity

Coordination of local rules
General permits or exemptions from local control

2 Preference for National Systems
Ensure viability of system and encourage investment

Landing Rights
Conditions in earth station licenses

3 Foreign Investment Limitation
Safeguard national security, Develop domestic industry

Legislation and License Conditions
Ownership changes

Space Insurance

P. Ruari McDougall

Senior Underwriter – Space

Munich Re

Münchener Rück
Munich Re Group

Insurance and Reinsurance

- Insurance provided by First Insurer to „Customer“ for a premium agreed between the two parties
- Re-insurance by Reinsurer/Underwriter of some or all of the risk incurred by First Insurer, for a premium that is normally agreed between the two parties
- Reinsurers can also further re-insure themselves

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Insurance and Reinsurance II

- Reinsurance allows:
  - passing of some or all of the risk
  - enhancing of capacity and market share
- Facultative vs. Treaty Reinsurance
- Example: Munich Re's approach to Space Insurance

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History of Space Insurance

1965: Early Bird/Comsat Third Party Liability and Pre-Launch

1968: First Intelsat series - three launches plus in orbit commissioning

1975: Full launch and in orbit coverage

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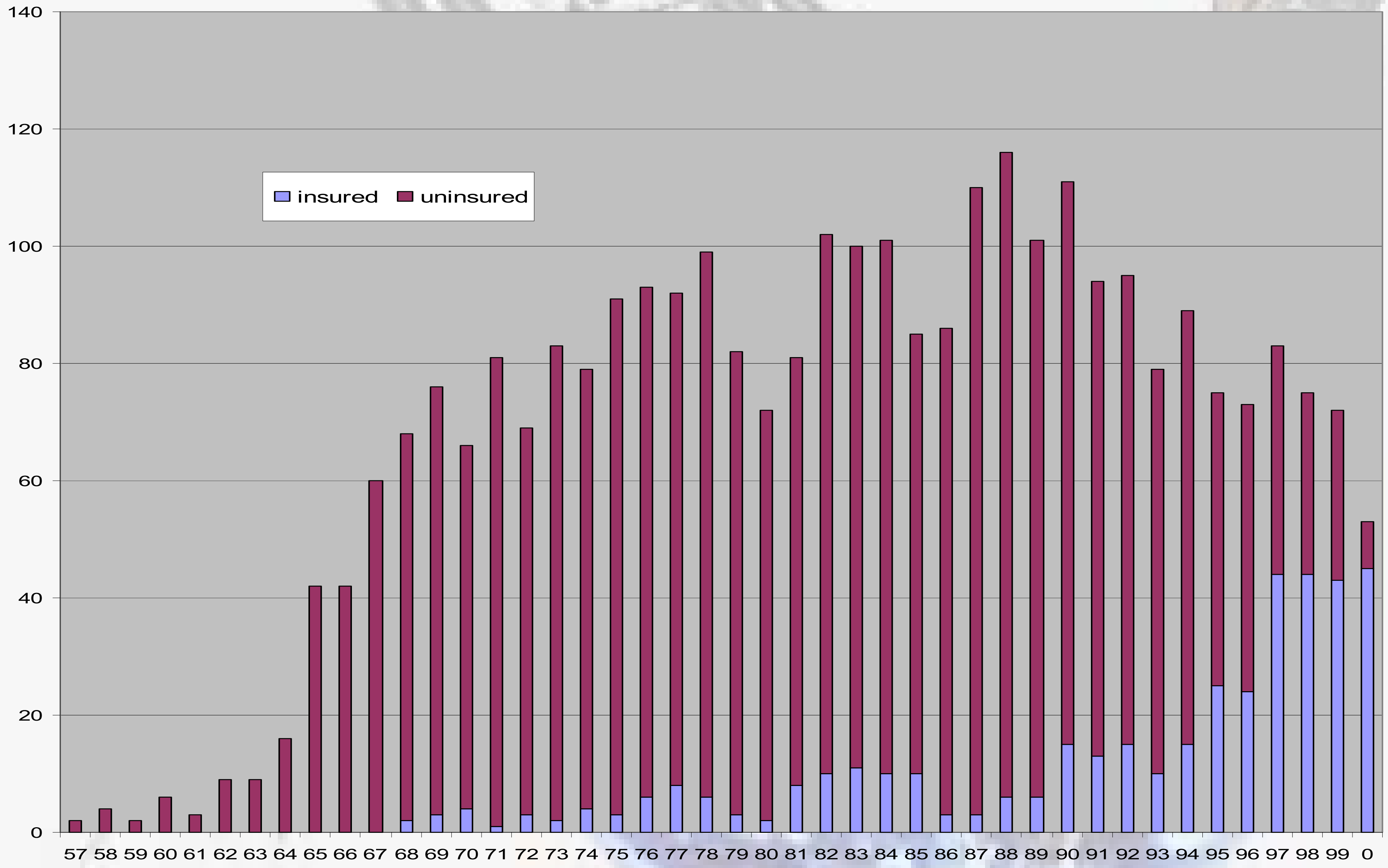
Launch Attempts 1957-2000



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Some Characteristics of Space Insurance

- **All-risks coverage (except exclusions etc.)**
- **Extremely low number of risks (pool)**
- **High/sensitive technology**
- **Rapid technological development**

Some Characteristics of Space Insurance II

- **Substantial sums insured – implications for placement**
- **Fluctuating capacity and market conditions**
- **Distinctive risk of total loss**
- **Difficulties of loss analysis and mitigation**
- **„Material change“ issues and „Utmost Good Faith“**

Space Insurance - Types of Coverage

- Pre-Launch
- Launch
- In-Orbit
- Third Party Liability
- Other (e.g. Incentives & Penalties, Mission Success)

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Pre-Launch Coverage

- **Usually placed in marine / non-marine markets, not in specialist space insurance markets**

- **Generally insured by manufacturer until passage of risk which often occurs at „Intentional Ignition“ or „Lift-off“**

- **In event of terminated ignition, ground risk <u>may</u> be covered under pre-launch cover**

Launch Coverage

- ❖ Placed in specialist space insurance markets
- ❖ All risks incl. launch failures
- ❖ Coverage is normally from „Intentional Ignition“ or „Lift-off“ until spacecraft separation
- ❖ Often in combination with initial in-orbit coverage under single policy e.g. „Launch + 1 year“
- ❖ Constant sum insured
- ❖ Predominant risk of Total Loss

In-Orbit Coverage

- Placed in specialist space insurance market
- All risks incl. loss of communication capacity
- Coverage is normally following spacecraft seperation until end of policy period
- Currently one-year increments - importance of health of spacecraft

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Munich Re Group

In-Orbit Coverage II

- Higher risk of losses during early and late in-orbit life
- Sum insured is „reflective“ of current book value – can be variable over coverage period
- Partial Loss, Total Loss, Constructive Total Loss

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Munich Re Group

Specialist Space Insurance Market

❖ **Typical Customers:**

- Satellite Owners/Operators
- Satellite Manufacturers
- Launcher Manufacturers / Launch Providers
- Other Named Insured's e.g. Governments, Banks, Parent Companies etc.

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Munich Re Group

Specialist Space Insurance Market II

- „Specialist“ Brokers e.g. Marsh Space Projects, ISB/Benfield, Willis Inspace, Aon etc.

- „Specialist“ sections of First Insurers & Reinsurers e.g.

  - Japan: Dowa, Tokio Marine
  - France: AGF, La Réunion Spatiale, SCOR
  - Germany: Munich Re
  - Italy: Generali
  - Switzerland: Swiss Re
  - UK: Lloyds Syndicates
  - USA: ACE, AXA Space, BIS, USAIG

Third Party Liability Coverage

- Generally covers risks arising from Pre-Launch, Launch and In-orbit operations

- Practical „fulfilment“ of the terms of the Liability Convention of 1972

- Specific licencing requirements established at national level by a number of States

- Risk of liability somewhat reduced in Pre-Launch and Launch by cross-waivers of liability

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Third Party Liability Coverage II

- ❖ Commonly procured at first instance by Launch Providers
- ❖ Subsequently by Launch Providers and/or Satellite Owners
- ❖ Usually not placed in specialist space insurance markets, but rather in aviation liability markets
- ❖ Subject to extensive treaty reinsurance
- ❖ Current market capacity of up to approx. $ 500 million, relatively low premium returns (e.g. 0.1 – 0.2 %)

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Other kinds of coverage

- ❖ Some may be placed in specialist space insurance market
- ❖ Launch risk guarantees
- ❖ Incentives & Penalties
- ❖ Mission Success
- ❖ Product Liability
- ❖ Loss of revenue

So, what about the law ?

- No specific space insurance law
- National legal regimes e.g. insurance law, commercial transactions, delict/tort, civil procedure
- Policy wording – individually negotiated, „space-unique“ terms & conditions
- Claims
- Subrogation
- Salvage

Other legal / policy considerations

❖ **Export controls:**

  - International e.g. Missile Technology Control Regime (MTCR), Wassennaar Arrangement

  - National regimes e.g. ITAR

❖ **Salvage – transfers of title / interests**

❖ **Implications of market capacity limitations**

❖ **National governments as “Named Insured”**

Thank you for your attention.

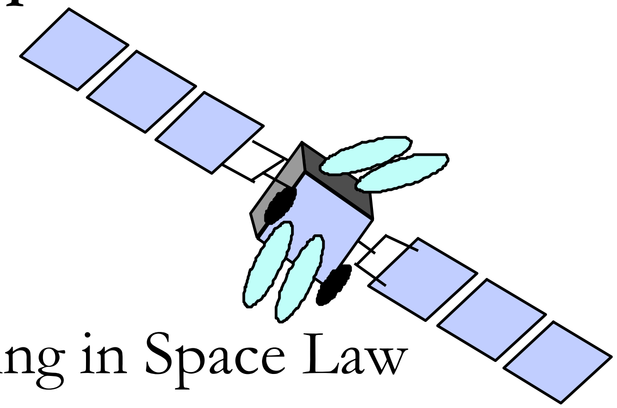
P. Ruari McDougall

Senior Underwriter – Space

Munich Re

Münchener Rück
Munich Re Group

United Nations/
International Institute of Air and Space Law



Workshop on Capacity Building in Space Law
Wednesday, November 20, 2002
The Hague, Netherlands

Laws and Policies to Promote Private Space Industry

Peter D. Nesgos
Milbank, Tweed, Hadley & McCloy, New York

Milbank

Introduction

The successful promotion of commercial space activities is directly linked to the certainty of laws and policies applicable to the implementation and operation of private satellite systems. Where these laws and policies are unclear, the sponsors and financiers of satellite projects face the prospect of delay, lack of adequate financing and undue operational risks and burdens. These serve to threaten the success of the ventures being promoted.

There are numerous legal and policy issues that currently challenge the private space industry because of the uncertainties they present, including:

1. International telecommunications regulations
2. Domestic licenses and concessions
3. Grant and perfection of security interests
4. Public support of infrastructure projects
5. Domestic tax rules
6. Export control of technology
7. Insurance coverage principles

1. International Telecommunications Regulations

Background

- International Telecommunication Union (ITU)
  - An international organization within the United Nations System where 189 governments and the private sector coordinate global telecom networks and services in accordance with its Radio Regulations and Regional Frequency Plans

- World Trade Organization (WTO) Agreement on Basic Telecommunications Services
  - Commits 84 participating countries to open their telecommunications services markets, including access to the public transport networks of incumbent suppliers under non-discriminatory terms and at cost-oriented rates

Issues

- ITU framework is politicized and complicated; deviates from open-market principles
  - Satellite radio-frequency coordinations are often akin to bilateral trade negotiations, requiring significant participation and support of government agencies

- The ITU Radio Regulations are intricate and difficult to interpret and administer

- Many WTO participating countries have not fully opened their markets and have yet to adopt standardized, open interfaces for interconnection to their public switched networks

2. Domestic Licenses and Concessions - 1

Background

- As part of WTO Country Commitments, many nations have agreed to adopt fair and transparent licensing procedures for the right to use spectrum for public or private services, as well as providing for certain flexibility in spectrum allocations to accommodate a variety of technologies

- A significant number of nations, however, still lack transparent, non-discriminatory licensing regimes and in certain cases apply strict foreign ownership limitations or restrictions on the transfer of licenses to potential purchasers

- Enforcement of radio-frequency usage / spectrum channelization compliance is also lacking in certain regions and countries, resulting in potential instances of harmful interference with wireless services

Issues

- For global operators, domestic licensing is often a costly and time-consuming endeavor

- Certain countries have or are in the process of establishing spectrum-usage tariffs – such additional regulatory costs could significantly impact the operations of global satellite communications services providers

Domestic Licenses and Concessions - 2

Background

- the domestic regulatory infrastructure of many countries is often lacking in clarity as regards the requirements for the issuance, continuation, assignment and termination of permits, licenses, authorizations or concessions to build, launch and operate satellites

- regulatory regimes that are developmental or discretionary serve to deter private sector financing

Issues

- financial institutions expect to be able to confirm the authorization of the satellite operator to manufacture, launch and operate its system under domestic law. This includes the clear grant of authority to operate the satellite for a definite term, ideally extending to the life of the system. Also desirable is the ability to assign such licenses either as security or in whole, subject to predictable and ascertainable conditions

- frequently the satellite operation authorizations constitute the most valuable asset of the project, albeit an intangible one

- onerous financial terms imposed by the licensing agency, including spectrum auctions and possibly revenue sharing, can result in an unsustainable economic burden on satellite projects, particularly those involving entrepreneurial ventures or new applications without a proven market base

3. Grant and Perfection of Security Interests

Background

- the International Institute for the Unification of Private Law (Unidroit) has developed international uniform rules to address the recognition of foreign security interests in mobile equipment across international frontiers. The Unidroit Convention on International Interests in Mobile Equipment was adopted in November, 2001 in Cape Town

- recognizing that the special legal problem of addressing competing claims in different jurisdictions where earth-bound mobile goods could be located is different for space-based equipment, a preliminary draft Protocol to the Convention on Matters Specific to Space Assets has been prepared by the Space Working Group, established by Unidroit

- the Space Protocol was presented to the Unidroit Governing Council in September 2001, reviewed by the Unidroit Steering and Revisions Committee in February 2002 and made available for transmission to governments with a view to convening a Unidroit Committee of governmental experts

Issues

- the lack of willingness of many financial institutions and satellite operators to take a long-term view of the efforts of the Space Working Group has delayed progress

3. Grant and Perfection of Security Interests – cont'd

- a fundamental issue to be addressed is the scope of the Space Protocol
  - as regards property that is intended to be launched and placed in space but that is on the ground
  - as to the means and criteria of identifying space assets
  - as to the scope of "associated rights" (meaning licenses to use or operate space assets, to the extent assignable under the laws concerned, rights to payment or other performance due to a debtor with respect to space assets and contractual rights held by the debtor that are secured by or associated with the space assets)
  - as to the remedies of repossessing space assets (including placement into escrow of access and command codes)

- continuing absence of clear rules under existing domestic laws precludes or delays the conclusion of asset-based satellite financing and forces the inclusion of added collateral or other forms of credit enhancement such as guarantees, letters of credit and cash collateral accounts

4. Public Support of Infrastructure Projects

<u>Background</u>

- ❖ governmental support of space infrastructure projects has traditionally come from public funding of research and development, science and military activities
- ❖ many commercial applications are spin-offs of government activities including launch transportation, mobile communications, remote sensing and broadband applications
- ❖ the demarcation of public (government) support versus private (commercial) backing often is a reflection of the strategic importance of an application or project and the receptivity of the financial marketplace (whether institutional or private)
- ❖ at times of economic downturn or financial conservatism, private space industry must look to government-supported initiatives and programs to sustain it
- ❖ export credit (U.S. Ex-Im, Coface, ECGD, JBIC) and multilateral agencies (Multilateral Investment Guarantees Agency, Overseas Private Investment Corp., European Investment Bank) are being resorted to with increasing frequency when more traditional financing is scarce
- ❖ all operate under guidelines and policies of the OECD (Organization for Economic Cooperation and Development) and the World Trade Organization

4. Public Support of Infrastructure Projects – cont'd

Issues

- while these agencies have provided critical support for satellite infrastructure projects requiring financing for satellite manufacture and launch services, procedures and approvals can be lengthy and politicized
- recent examples: – Shin Satellite – iPSTAR
  – Satelites Mexicanos – Satmex
- PPPs (Public Private Partnerships) and (U.K.) PFIs (Private Finance Initiatives) continue to draw attention, particularly for large infrastructure projects with public service features
- PPP is a general term for a variety of relationships between the public and private sectors where the government could act as concession grantor, facilitator, shareholder, guarantor, promoter or joint venturer
- there is inherent complexity in the structure, including such factors as extent of competition, accounting treatment, project risk allocation, pricing and payment structures, usage risk, termination rights and bankability
- most prominent recent example: Galileo (concession-based PPP model)

5. Domestic Tax Rules

Background

- domestic fiscal policies, laws and regulations may serve to stimulate or deter economic activities

- in the United States, the investment tax credit spurred significant leveraged lease financing of equipment, including satellites and transponders, in the early 1980's before it was repealed in 1986. The same can be said regarding the "foreign sales corporation" structure, which stimulated the sale and lease of U.S. manufactured equipment for use outside the country, before this benefit also was curtailed

- private space industry could be better promoted through domestic tax law engineering

Issues

- promulgation, interpretation and application of domestic tax laws must be carefully considered to promote sustainable commercial space activities

5. Domestic Tax Rules – cont'd

- in the United States, proposed Treasury regulations were issued in January 2001 and, if finalized in their current form, could materially affect the U.S. taxation of the income of non-U.S. satellite operators, even with no United States-based business activity. Under the proposed regulations, if 50% or more of the voting power or value of the shares of such operators is owned by U.S. persons or if such operators are deemed to be engaged in a trade or business in the U.S. to any extent and certain other conditions are met, all of the income from its space activities could be treated as income from U.S. sources and be subject to significant U.S. income taxes

- the ability of the U.S. Internal Revenue Service to successfully collect such taxes from a non-U.S. corporation with limited U.S. activities and assets based merely on ownership of its shares by U.S. persons is uncertain. The proposed regulations are not currently effective and it is unclear whether or when they will be issued in final form. The proposed regulations, including aspects of the proposed regulations discussed above, have been strongly criticized by industry participants and tax professionals. It is therefore possible that any final regulations will differ from the proposed regulations

6. Export Control of Technology

Background

- Certain communications facilities and technology, such as commercial satellites, earth station equipment or detailed satellite health status/anomaly information, are subject to various domestic export control regimes

- Technology export control approval processes, which are generally subject to national security and political considerations, often lack transparency, are time-consuming and may result in partial or conditioned approvals

Issues

- In recent years, U.S. satellite manufacturers have encountered difficulties in timely obtaining export licenses for commercial satellites, components thereof or related technology

- The lack of predictability and transparency associated with certain technology export control regimes can be an impediment in the procurement of satellites or related earth station equipment, launch services, and in certain cases, insurance coverage for and financing of commercial satellites

7. Insurance Coverage Principles

Background

- ❖ satellite launch and in-orbit insurance policies continue to be manuscript versus standard forms, despite many common conditions
- ❖ key terms include loss definitions and formulations, insuring agreements and claims procedures
- ❖ a combination of negative loss experience involving complicated claims, adverse performance in the satellite manufacturing and adverse experience in the insurance sectors overall and lack of precision in policy drafting has resulted in an increase in disputes

Issues

- ❖ proper endorsement as additional insureds/loss payees
- ❖ interpretation of total, constructive total and partial loss and "occurrence"
- ❖ waiver of right of subrogation

7. Insurance Coverage Principles – cont’d

- enforceability of “cut-through” arrangements

- salvage rights and security interests

- the emerging trend of increased disputes resulting from ambiguities in policy terms coupled with a tendency towards restricting terms and conditions based on adverse loss experience has created uncertainty as to coverage amounts and terms

- satellite insurance is an integral part of satellite financing. The inability to arrive at common understandings as to the scope of coverage adversely affects private space industry

Conclusion

- The promotion of private space industry requires the careful consideration and improvement of a diverse array of basic policies and laws addressing regulation, commercial principles, finance, taxation and insurance, among many others

United Nations/International Institute of Air and Space Law
Workshop on Capacity Building in Space Law
Wednesday, November 20, 2002
The Hague, Netherlands
Ministry of Foreign Affairs (Van Kleffanszaal)

Laws and Policies to Promote Private Space Industry

Peter D. Nesgos
Milbank, Tweed, Hadley & McCloy LLP

ABSTRACT

The successful promotion of commercial space activities is directly linked to the certainty of laws and policies applicable to the implementation and operation of private satellite systems. Where these laws and policies are unclear, the sponsors and financiers of satellite projects face the prospect of delay, lack of adequate financing and undue operational risks and burdens, which serve to threaten the success of the ventures being promoted.

This paper will consider a diverse selection of legal issues that currently challenge private space industry because of the uncertainties they present. These issues include: international telecommunication regulations that do not promote the expeditious coordination and registration of radio frequencies and orbital positions; domestic laws that fail to provide a clear system for the licensing of satellites and the transfer of licenses and concessions; the absence of clear rules governing the granting and perfecting of security interests in orbiting satellites; the absence of sustainable regimes for the public support of large space infrastructure projects; concerns regarding the effects of domestic tax laws on global satellite enterprises; lack of certainty in regulations applicable to the exportation of high technology information and hardware; and coverage ambiguities in the insurance of satellites.

The foregoing issues will be illustrated by various recent practical examples. Where appropriate, specific recommendations will be proposed to enhance clarity and promote certainty.

Milbank

Peter D. Nesgos
Partner
Milbank, Tweed, Hadley & McCloy LLP

Peter D. Nesgos is a partner with the law firm of Milbank, Tweed, Hadley & McCloy LLP in New York and has over fifteen years of experience working with the aerospace and communications industries and the financial and insurance communities in structuring commercial space and satellite projects.

He has represented banks, leasing companies, space manufacturers and satellite operators in numerous financings involving secured and unsecured credit facilities, project and vendor financing, tax-motivated leases, off-balance sheet loans, private placements and public offerings.

A graduate of McGill University's Institute of Air and Space Law (from which he holds Masters and Doctoral degrees in space law), he was a Visiting Scholar at Columbia University, School of Law. He is an Adjunct Professor of Law at the Institute of Air and Space Law, McGill University and a Lecturer at the International Space University in Strasbourg, France.

He has chaired and spoken at various space and communications conferences and is also the author of the chapter titled "Satellites and Transponders" in the text on Equipment Leasing published by Matthew Bender & Company.

Capacity Building in Space Law
The Hague, November 20, 2002

Intellectual Property Law and Space Activities

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Structure of presentation

- Legal principles of intellectual property rights
  - Notions and roles of intellectual property rights
- Relevance of intellectual property law to space activities
- International conventions
- Possible issues

What is Intellectual Property (IP)?

- Intangible property (asset) = creation
  - <u>New ideas</u> … patents, topographies of integrated circuits, trade secrets
  - <u>Distinctive names</u> … trademarks, trade names, geographical indications
  - <u>Original expressions</u> … copyright and related rights
  - <u>Appearance</u> … industrial designs
- Often traded in its own right = licensing

Each IP title has different conditions and type of protection according to its role.

- Patents (Development of technology)
  - Conditions of patentability (novelty, inventive step, industrial applicability, sufficient disclosure)
  - Disclosure of invention to the public
  - Exclusive rights for limited period
- Copyright (Protect literary and artistic works)
  - Protection of expressions
  - Originality
  - No registration

Relevance of IP to Space Activities

- Privatization and commercialization
  - States and private sector
  - conscious of "property"
- Globalization
  - international cooperation
  - conscious of simple, uniform and reliable legal framework
- New business opportunities
  - Space tourism

- Paris Convention for the Protection of Industrial Property (1883)
- Berne Convention for the Protection of Literary and Artistic Works (1886)
  - National treatment
  - Independence of protection = Territoriality

- Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) (1994)
- Patent Cooperation Treaty (PCT) (1970)

- 1967 Outer Space Treaty
  – No IPR provision
  – Non-appropriation of space
    <---> Appropriation of space object
  – A registry State retains the jurisdiction and control over a registered space object and over any personnel thereof.
- 1975 Registration Convention
  – No IPR provision
  – A launching State shall register the space object.

IP Law and Space Law

IP		Space law
Territorial legal framework	⟺	Nationality (registered state) jurisdiction

- Whether a territorial based IP law applicable to nationality based space objects?
- 35 U.S.C. §105
  - Any invention made, used or sold in outer space on a space object or its component under the jurisdiction or control of the US
  - Exceptions: foreign registry, int. agreement

Paris Convention Article 5*ter*

- Temporal or accidental presence of patented devices used in the body or accessories of vessels or in the construction or operation of aircraft or land vehicles on a territory in which a patent was granted.

  --> Shall NOT be considered as infringements of the rights of a patentee.

Space articles in transit and flight elements?

Intergovernmental Agreement 1998 (IGA), Article 21

- An activity occurring in or on a Space Station flight element shall be deemed to have occurred only in the territory of the Partner State of that element's registry.
- Any European Partner State may deem the activity to have occurred within its territory for ESA-registered elements.
- IPR protected in more than one European Partner State
  - Not enforceable in more than one State for the same act of infringement.
  - Shall recognize a valid license in any other States

Protection of Databases

- WIPO Copyright Treaty (WCT) (1996)
  – Computer programs
  – Compilation of data
  – Right of communication to the public, applicable to outer space transmission

- Protection of non-original databases
  Being discussed by WIPO/SCCR

WIPO Arbitration and Mediation Center

- Resolution of commercial disputes involving IPRs through arbitration or mediation
  – Cost and time
  – One single procedure
  – Expertise
- ICANN-accredited domain name dispute resolution service provider
  – Abusive registration and use of domain names *identical* or *confusingly similar* to trademark or service mark
  – Received over 5,000 cases since Dec. 1999

Conclusion

- IP is an essential part of any technological development, including space activities.

- Nationality-based space law challenges existing IP legal framework.
  - Still many questions to be clarified.
    - Efforts to further harmonize national/regional patent law.
    - International norm or contractual agreements.

URLs

- WIPO

  http://www.wipo.int
  [activities, meetings, Treaties, IP in general and specific topics, national and regional IP laws, links]

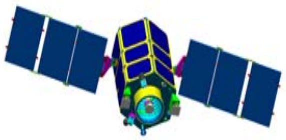
- WIPO Arbitration and Mediation Center

  http://www.arbiter.wipo.int

Space Policy and Institutions in the Republic of Korea

20 November 2002

Eun-Chul CHOI
Ministry of Science & Technology
Republic of Korea



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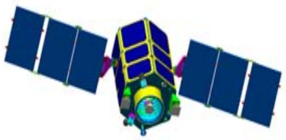
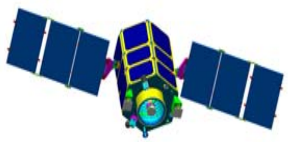


Ⅰ. National Space Programme(2000~2015)

□ National Goals

O Increase utilization of Space Technology in economic development
- Communication / weather, ocean, environment / new material and medicine development, etc.

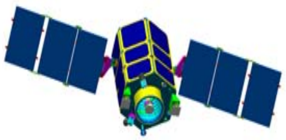
O Launch a small satellite using Korean-made space launcher until 2005
- Develop a space launcher for small LEO satellite
- Construct Space Center for the launching of Space Vehicle



National Space Programme(2000~2015)

O The Major Goals in space development until 2015

- **Develop Science, Remote-sensing and Telecommunication satellites**
- **Develop Space Launchers capable of 1.5ton class LEO satellite**



☐ Overview

O Budget : US$ 4.3 B until 2015

O Satellite Programme : 20 Satellites Development

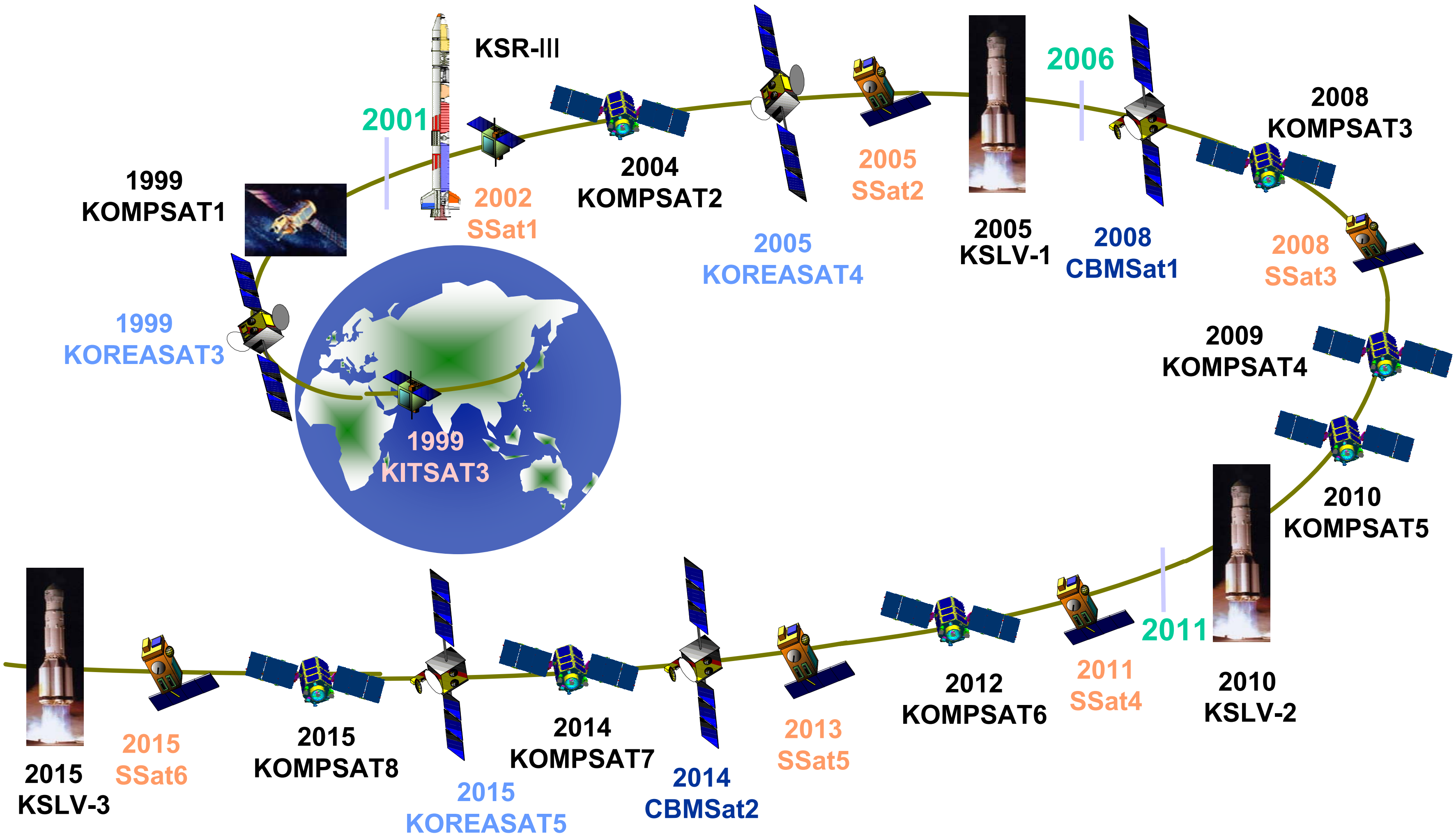
- Multi-Purpose Satellites(8) : Remote sensing
- Science Satellites(7) : Science Experiment, Technology Test
- Geo-Stationary Satellites(5) : Communication, broadcasting and meteorological satellites

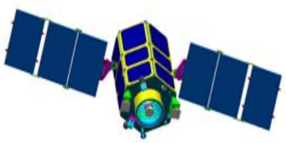
O Space Launch Vehicle development Plan

- 100kg payload by 2005 ➡ 1ton by 2010 ➡ 1.5ton by 2015

O Construct Space Center for launching small satellite by 2005

National Space Programme(2000~2015)





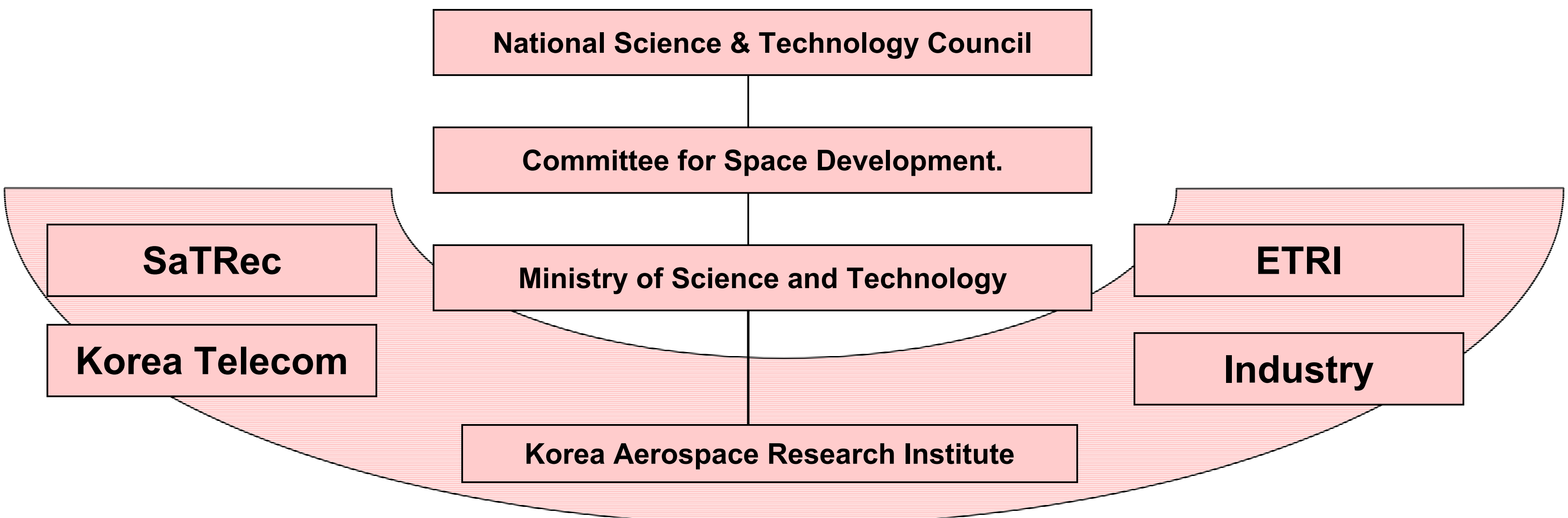
Ⅱ. Space related government Organizations and Institutions

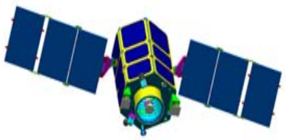
□ Legal Framework for Space Technology Development

O legal base

- Science & Technology Framework Law (enacted in January 2001)

O Structure for Space Development





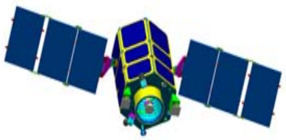
□ Government Bodies

O NSTC(National Science & Technology Council)

- Established in 1999
- Chaired by the President
- Supreme body for inter-ministerial coordination of S&T policies and R&D investment

O MOST(Ministry of Science & Technology)

- Established in 1967
- Serves as the secretariat for the NSTC
- Responsible to coordinate S&T policy among the ministries
- Review and coordinate national S&T policies and R&D programs, and set the priority for the allocation of S&T budgets
- Responsible for Space Development



O MOCIE(Ministry of Commerce, Industry & Energy)

- Established in 1948
- Trade policy related to export and imports , energy & resources , Industrial technology policy etc.
- Industry policy for promotion of the aircraft industry

O MIC (Ministry of Information & Communication)

- Facilitating Informatization, Promotion of IT industry
- Responsible for telecommunication satellite and services

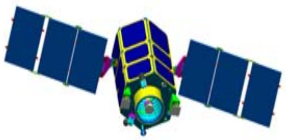
☐ Research Institutions

O Korea Aerospace Research Institute (KARI)

- Established in 1989, Government-funded research institute
- Key space development center in Korea
- Overall R&D institute on satellite, space launcher, space application & aircraft

O KAIST Satellite Technology Research Center (KAIST SaTRec)

- Established in 1989
- A university based research center for science satellite development
- Promote education and training of satellite engineers through research programmes in satellite engineering, space science and remote sensing



□ Research Institutions & Private Companies

O ETRI (Electronics and Telecommunications Research Institute)

- Established in 1976, a government-funded research Institute
- Research on Broadcasting, Telecommunication, Computer & software, Information Technology

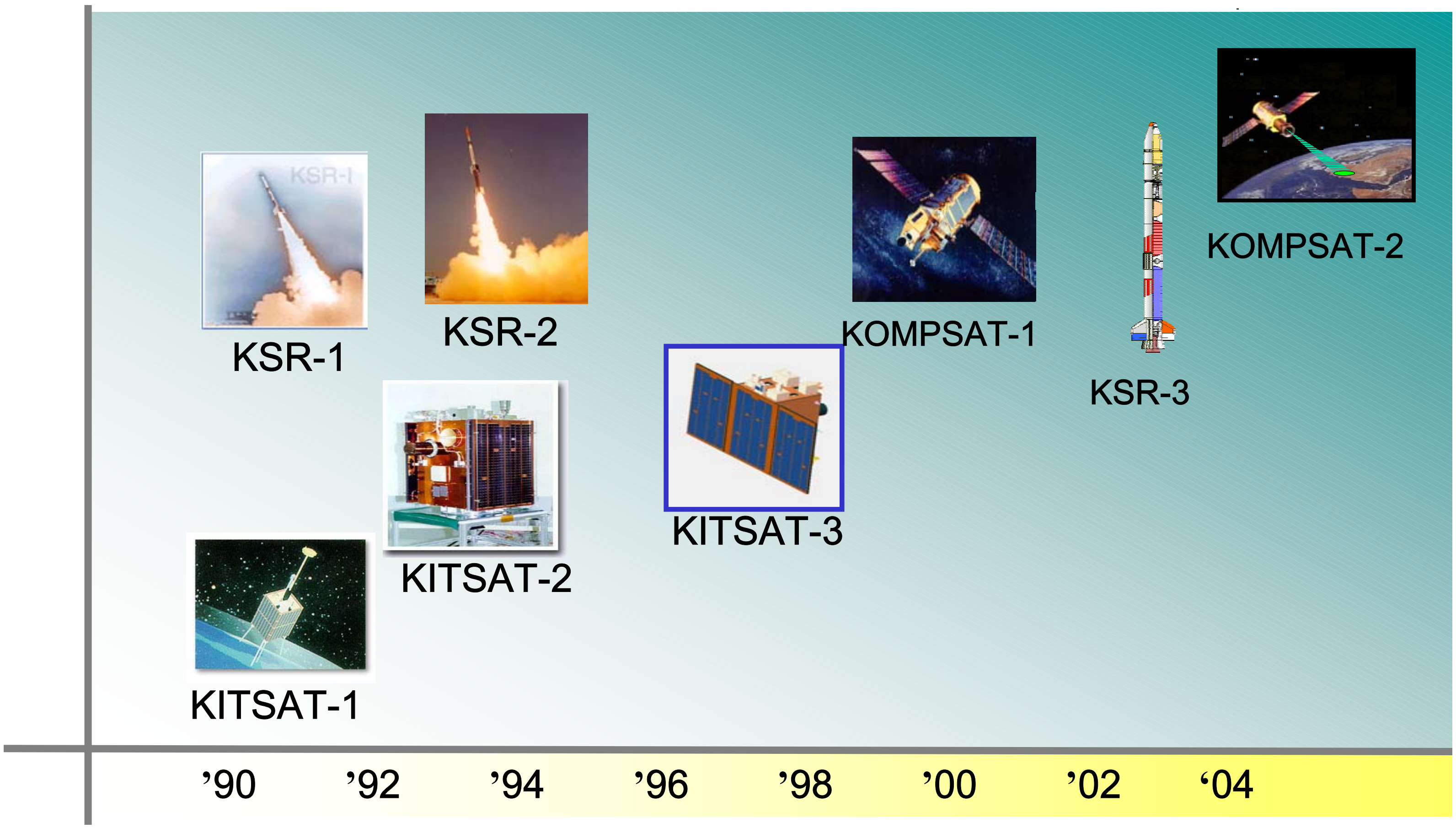
O KAI (Korea Aerospace Industries, Ltd.)

- Established in 1999, through the merge of the aerospace business of the three companies(Daewoo heavy Ind., Samsung aerospace, and Hyundai Space and Aircraft)
- The key aircraft manufacturer in Korea

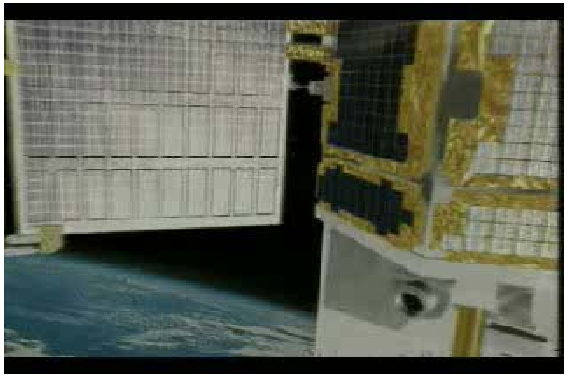
O Other Companies

- KOREAN AIR
- Hyundai MOBIS, HANWHA

III. Major Space Programmes



□ KOMPSAT-1 (Korea Multi-Purpose Satellite-1)



O General

– Periods : Nov. 1994-Jan. 2000

– Budget : US$ 187 M

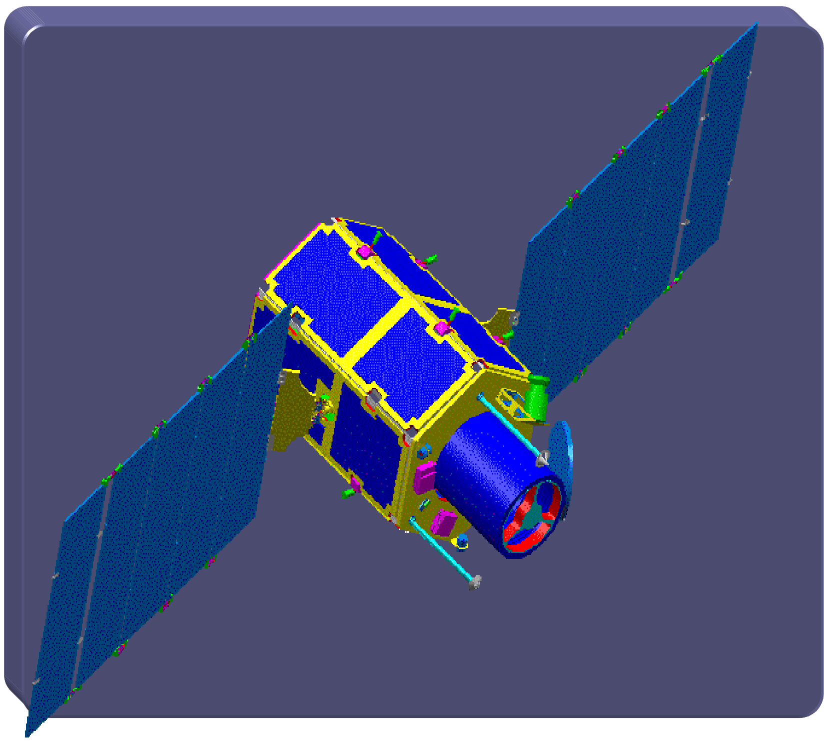
O Payloads

– Earth Observation (Res. 6.6m)
– Ocean Monitoring (OSMI)
– High Energy Particle Sensor (IMS) & Ionospheric Measurement Sensors (IMS)

O Specification

– Size : 1.35m (D) X 2.5m (H)
– Weight : 470 kg

□ KOMPSAT-2 (Korea Multi-Purpose Satellite-2)



O General

- Period : Dec. 1999 ~ May 2004
- Budget : US$ 190M

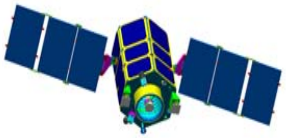
O Payloads : High Resolution Camera

- Resolution : 1m panchromatic,
  4m color
- Co-development with ELOP

O Specification

- Size : 1.85m (D) X 2.6m (H)
- Weight : 800kg
- Altitude : 400~800km

O Development Organization : KARI



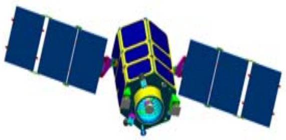
□ KITSAT-1, 2, 3 Uri-Byul

O Mission

- 1 : Earth Observation (Res. 400m), Scientific Experiments
- 2 : Earth Observation (Res. 200m), Scientific Experiments
- 3 : Earth Observation (Res. 13.5m), Scientific Experiments

O Details

No.	Wt.	Orbit	Launch	Life Span
1	50kg	1,300km	Aug.1992	3yr
2	50kg	820km	Sep. 1993	3yr
3	110kg	720km	May 1999	3yr



□ Science Satellite - 1

O Goal : Development of science satellite
O Period : 1998 ~ 2002
O Budget : 11.7 B won (9 M US$)
O Key specification : Weight 100kg, Altitude 700 ~800km
O Responsible Organization : KARI(KAIST Satrec)

□ Science Satellite - 2

O Period : 2002 ~ 2005
O Budget : 13.7 B Won (11.4 M US$)
O Weight : 100kg, Altitude 700~800km

□ Communication, Broadcasting and Meteorology Satellite 1

O Feasibility study on this Project is being carried out
O Period : 2002~2008
O Budget : 288 B Won(240 M US$)

☐ KOREASAT-1, 2, 3

O Mission : Telecommunication

O Orbit : Geo-Stationary (35,786 km)

O Transponders (36MHz / No.)

- 1, 2 : 3 (Broadcasting), 12 (Comm.)
- 3 : 6 (Broadcasting), 27 (Comm.)

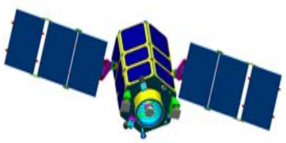
O Details

No.	Wt.	Launch	Life Span
1	1,464 kg	Aug. 1995	4.5yr
2	1.464 kg	Jan. 1996	10yr
3	2,800 kg	Sep. 1999	15yr

□ Space Launch Vehicle Programme

Launch of KSR II

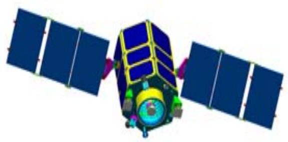
- **KSR I : Single Stage Solid Propellant Sounding Rocket (1993)**
- **KSR II : Two Stage Solid Propellant Sounding Rocket (1997)**
- **KSR III : Liquid Propellant Sounding Rocket (2002)**
- **KSLV I : Space Launch Vehicle to launch small (100 kg) LEO satellite (2005)**



□ Korea Sounding Rocket -III

- O Goal : Develop Liquid Propellant Sounding Rocket
- O Period : 1997 ~ 2002
- O Budget : 82.4 B won (68.7 M US$)
- O Key Specification : Weight 5.6ton, Length 13.4m
- O Responsible Organization : KARI

※ 1 and 2 stage solid propellant sounding rocket was developed in 1993 and 1997 respectively



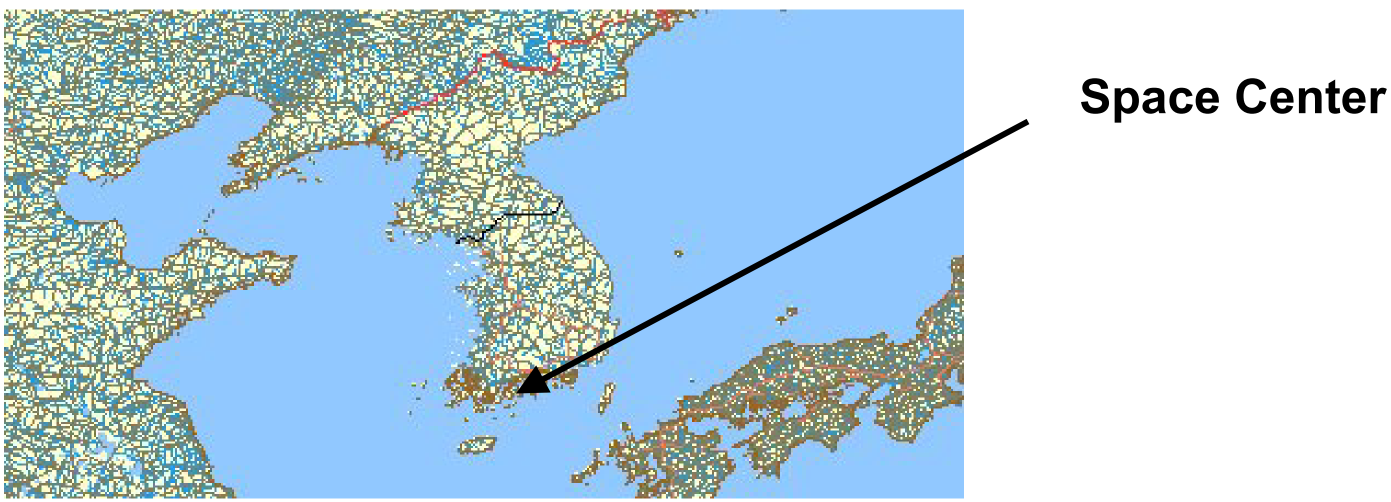
□ Small Satellite Launch Vehicle(KSLV-Ⅰ)

- O Goal : Development of Launch Vehicle for small satellite
- O Period : 2002 ~ 2005
- O Budget : 360 B won (300 M US$)
- O Responsible Organization : KARI

□ Space Center

O Space Center is Under Construction

- Location : GO-HUNG, Southern part of Korea
- 1st stage construction of Space Center will be completed in 2005 for launch of KSLV-1



□ Space Center Construction

O Goal : Construction of Space Center for Launching the small satellite until 2005

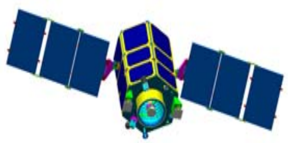
O Period : 2000 ~ 2005

O Budget : 150 B won (125 M US$)

O Key facilities : launch facility, communication and tracking system, etc.

O Responsible Organization : KARI

※ Location : Gohung-Gun, Southern part of Korea



□ Present situation

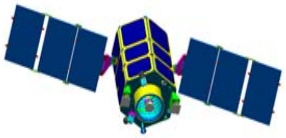
O Korea is a member of UN Treaties on the space development

- Treaty on the exploration and Use of outer space(1967), Agreement on Astronauts Rescue(1968), Convention on Liability for Damage(1972), Convention on Registration(1976)

O National measurements to implement the UN Treaties are not prepared yet

□ Enacting the National Space Law

O Korea is under feasibility study to enact the national space law consistent with the UN Treaties.



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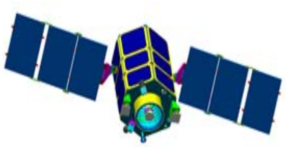

Space Policy and Institutions in Malaysia

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This paper will give an overview of space policy and institutions in Malaysia. However, before I go any further, it is best to explain the present status of Malaysia with regards to the United Nations Treaties and Principles on Outer Space. Despite studies and tremendous work and consultations done on the Outer Space treaties and conventions, Malaysia is only a signatory country to the Outer Space Treaty and the Rescue Agreement, while ratifications have only been done on the Nuclear Test Ban Treaty, the INTELSAT Agreement, the International Mobile Satellite Convention and the International Telecommunication Union (ITU) Convention. This means that Malaysia is not a party to any of the UN Outer Space Treaties and Principles, as yet.

At this stage, it is obvious that Malaysia can be considered as new in space activities, since the first satellite successfully launched into orbit was in 1997, with the second satellite in the same year. Three years later, our micro-satellite, TiungSAT, was launched in the year 2000. At present, Malaysia owns MEASAT-1 and MEASAT-2, which operate using payloads for telecommunication services; this is taken care of by several private companies, namely, ASTRO, BINARIANG and MAXIS. The latest satellite launched, TiungSAT-1, carries a scientific research payload. The TiungSAT-1 programme took Malaysia on a voyage of learning, showing that it is not impossible for anybody to acquire skills in satellite design and construction with an adequate degree of confidence. We also discovered that to fully exploit space-derived tools in the future, we would have to come up with our own space infrastructure in order to solve our problems ourselves and not to depend on others (Mazlan Othman, 2001).

These lessons are invaluable when charting a path for a sustainable space programme for the country, one that focuses on human resource development, R & D promotion, technology advancement, industrial extension, policy making and the ultimate use of space for acquiring and transmitting information. With the National Space Agency of Malaysia newly born on 1st July 2002, the mandate to coordinate, administer and monitor all space activities in Malaysia was handed to the Agency.

In becoming party to the United Nations treaties on outer space, Malaysia should first acquire full understanding of the contents of the treaties, their objectives, and their legal implications for a High-Contracting Party and a Non-Contracting Party. We also have to study the advantages and disadvantages, if any, of being a High-Contracting Party to those treaties. This is to be attained through a methodical and thorough study of the treaties, and holding discussions with other High and Non-Contracting Parties regarding many matters involved. The country also has to conduct a meticulous comparative study on existing domestic laws applicable, so that the application of the United Nations treaties on outer space will not come into conflict with present rules and regulations.

This subject matter is quite complex and it involves many competing issues, since ratification of the treaties would not only have an impact on space activities in the country, but also on other matters as well. Different policies and their applications will have to be considered, and many ministries and parties will have to take part accordingly. Thus, becoming a party to the treaties is a highly delicate matter and needs intense study and active participation by all parties concerned.

At this moment, there is no law yet enacted regarding space activities in Malaysia, since we see that there is no actual immediate need to have specific comprehensive legislation on this matter. For example, there is no law regulating the launching of any space objects belonging to Malaysia, nevertheless, we already have three objects orbiting in outer space. All of the launchings of those objects have been done by way of bilateral arrangements between parties involved. However, we do have several existing laws that govern to a certain extent, namely:

1. Communications and Multimedia Act 1998;[1]
2. Malaysian Communications and Multimedia Commission Act 1998;
3. Communications and Multimedia (Licensing) Regulations 1999;
4. Telecommunication Services (Successor Company) Act 1985;
5. Civil Aviation Act 1969 and Carriage By Air Act 1974;
6. Energy Commission Act 2001;
7. Geological Survey Act 1974;
8. Insurance Act 1996;
9. Patent Act 1983 (Amd. 1995);
10. Trade Marks Act 1976 (Amd. 1996).

Furthermore, the 9th Schedule of Malaysian Federal Constitution states that 'Space Matter' is under the Federal Government jurisdiction, thus, it is up to the Federal Government to enact any laws pertaining to it. Article 76 of the Federal Constitution also lays down that: "…for the purpose of implementation of any international Agreement, the Federal Government has the right to make laws…" supporting this situation. This explains that laws on matters relating to space activities are to be enacted at the federal level.

What is considered as a 'Space Matter' or 'Space Activities' as mentioned above? We may divide space matters or space activities into four categories, namely: Inventions, Launching, Education and Applications.

Invention is best described as any kind of innovation based on space-related activities supported by the Patent Act and the Trade Marks Act. This kind of innovation may result from scientific research, a creative invention or acquired knowledge.

Launching has been a successful procedure for Malaysia, since three of our satellites reached orbit; several others are waiting in line. Launching procedures can be seen as space activities involving Malaysia only indirectly, since all three satellites were launched by foreign companies: MEASAT-1 and 2 were launched by Arianespace, a French registered company and TiungSAT-1 by the Government of the Russian Federation. Liability regarding this matter was governed by the Letter of Undertaking by the private owner of the space objects, with the incorporation of a clause requiring the private owner to indemnify the government for any claims or insurance coverage in cases of damage occurring from the launching or operating of the space objects.

Education is also among the priorities of Malaysian space policy, with the aim of promoting studies in space science and laws relating to it. At the moment, courses in space science and technology and space law are taught in several local universities in Malaysia. Many public awareness programmes have been initiated in order to make Malaysia a well-versed nation on space matters. We can also name the micro-satellite of Malaysia, TiungSAT-1, which was intended for scientific research, as working towards the government's education policy.

[1] Please refer to: http://www.cmc.gov.my/mcmc/the_law/legislation.asp at: http://www.cmc.gov.my/mcmc/.

Educating the nation in space law and policy first needs enthusiasm and interest. This is to ensure that a layman knows what space law is all about, aside from developing the field to a higher level, aimed at university education or special interests. In parallel to developing specialists, mass education starting from primary education is very important to give young people some knowledge about space and stars. Initiating exhibitions, promotions and competitions can also achieve this purpose. At a higher level, workshops and seminars can be set in a concerted effort to introduce the public to space law and policy, as well as ensuring adequate access to reference materials nationwide. On a more advanced level, it is imperative that education in law and regulations be established.

In my personal humble opinion, it is high time to have suitable curricula in schools and universities that include education in space law and the policies behind it, in addition to space science and technology. We hope that by educating the whole nation in the importance of this field of law, we can build up a space-faring nation for future development.

There are three major applications of space activities in Malaysia: telecommunications; broadcasting; and remote sensing. Both MEASAT-1 and MEASAT-2 are under the operation of BINARIANG, a company licensed to operate telecommunications services under the supervision of the Communication Commission. Whereas in the field of broadcasting, ASTRO was given a licence to operate under the supervision of the Ministry of Information. Both activities regarding telecommunications and broadcasting were licensed for frequencies granted by the Communication and Multimedia Commission, and the end-users of these applications include the public, military, navigation, aviation, and so on.

The Malaysian Centre for Remote Sensing or 'MACRES', coordinates another equally important application, remote sensing. The use of remote sensing data is very important to obtain information about the environment, mapping, land mining and weather forecasting, to name a few areas. This centre was given the role to act by the Ministry of Science, Technology and Environment, while the end-users for this application include many government agencies, for example the Meteorological Department, the Department of Environment, the Fisheries Department and the Forestry Department.

It is obvious that space activities in Malaysia deal with a number of cross-sectoral issues, and all of these applications already have laws or policies regulating them. A country that is in a preparatory stage of developing new laws needs specialists in that area who are well versed in space law and related issues. In order to have these specialists, many individuals have to be given the opportunity to be involved directly with the development of international space law in the United Nations, especially within the Office for Outer Space Affairs, the International Institute of Space Law as well as in other notable space-faring countries. Participation in workshops and seminars as well as meetings is of great importance. Assistance is needed from eminent space jurists and technical experts, as well as information on new issues progressing in the United Nations.

Policies of the Malaysian Government also need to be in line with the existing space law policies applicable to every State Party to the Treaties. Likewise, institutions must prepare to develop papers informing the government of the importance of these treaties, especially to cover the space activities of the nation. Information and introductions to foreign laws that have already come into force in various countries would also be very useful in view of the fact that by studying foreign practices, Malaysian domestic laws can be further improved.

The National Space Agency, which is under the Ministry of Science, Technology and Environment, aims to coordinate Malaysia's requirements in aerospace and satellite technology. It has also been entrusted with the tasks of identifying necessary infrastructure, formulating a national space policy, and planning space and satellite programmes. The tasks handled by the Agency not only include supervision of space activities in Malaysia, but also providing a platform for discussion on legal provisions in order to develop laws and policies, presently still lacking, to regulate those activities. The procedure, however, is very complicated, starting with research, consultation and drafting carried out by the Agency.[2]

The Agency is needed to coordinate channelling of research and industrial development, while regulation by means of legal instruments is vital to ensure harmonization with international regimes and also proper conduct of activities in the country. Administrative directives through policy, planning and management are crucial. Monitoring, on the other hand, is also an important function of the Agency to guarantee that implementation is in accordance with the law. In implementing a space programme, it is important to recognize the opportunities the programme provides for international cooperation, including not only globalisation of our market, but also all activities that have been or are being carried out are executed with international partners (Mazlan Othman, 2001).

The status of Malaysia as a Non-Contracting Party to any of the United Nations space treaties and conventions is at present being comprehensively discussed between ministries and parties involved. It is well recognised that the United Nations treaties and principles on outer space are instruments that govern the behaviour of States to make certain that the phrase '… peaceful uses of Outer Space…' is well applied. As these constitute the international space legal regime, I strongly believe that Malaysia needs to give urgent and serious consideration to this matter and accede to these treaties in order to be seen as a responsible actor and participant in the space world. This, however, is my personal opinion and does not portray the opinion of the Government. In considering the membership of the treaties, our legal and administrative infrastructures have to be in place to review the full operation of those treaties. We also need to put domestic legal and administrative regimes in place in order to regulate our space industry, which will grow in the future.

We can be only assured that our space endeavours are beneficial and sustainable if we have an appropriate system of governance in place. Such a system should include institutional or organisational capacity, legal instruments, administrative tools and the required human resource capability.

Thank you.

[2] The draft then has to be sent to the Attorney General's Chamber for approval. After the approval from the AG's Chamber, it has to be discussed in the House of Representatives, which consists of persons elected by the people, including Ministers. The draft has to pass this stage in order to be read and further discussed and to be called as a 'Bill'. At the Bill stage, the long title will be read for the first time, the general principles will be argued and vote of simple majority is needed to pass this stage. In the next phase, an approval from the Supreme Power of Malaysia is needed for the Bill to be gazetted and published as a Law.

Indian Space Law and Policy: A Private Sector Perspective

Mehmood Pracha
Organization for Promotion of Legal Awareness, India

HISTORICAL BACKGROUND OF SPACE SCIENCES IN INDIA

Ancient Indians' interest in astronomy was an extension of their religious and social preoccupations in the subject itself. Astronomy, astrology and mathematics have all been subjects running parallel to each other. Astronomy grew into systematic observation and speculation and moved forward into scientific inquiry and interpretation, finally emerging as a sophisticated discipline. The chief source of astronomy-related information is the Vedic texts, Jain literature and the Siddhantas (principles) as well as endeavours in Kerala. In India, the study of space as a science was pursued in the form of astronomy and astrology as early as the Vedic times, i.e., 3,000-1,000 BC. The first written reference on astronomy is found in Rig Veda 2,000 BC. Vedic Aryans worshiped the Sun, stars, planets and comets. During that time, astronomy and astrology were both interwoven with each other. Since ancient times, Indians have had knowledge about planets (called the Grahas) and have involved them with the determination of human fortunes; however, at the same time the study of Grahas or the planets was carried out with great scientific finesse and detailed mathematical calculations.

Aryabhatta, the great ancient Indian scientist said to have been born in 476 AD, when still a young boy went to the University of Nalanda, in the present day state of Bihar, to study astrology. He made significant contributions to the field of astronomy, propounding the heliocentric theory of gravitation and devising methods for calculating the areas of triangles, the volume of spheres, and square and cube roots. He also had the idea that the Sun was the source of moonlight and eclipses. Aryabhatta's astronomical calculations, expounded in his "Aryabhatta-sidhantta", were quite reliable for fixing the Hindu Calendar (Panchanga). Astronomers in ancient India were able to arrive at near perfect measurements of astronomical movements and predict eclipses.

Aryabhatta was the first to propound the theory that the Earth is round. Another Indian astronomer called Brhamagupta estimated in the 7^{th} century that the Earth's circumference was 5,000 "yojana", considering that one yojana is 7.2 km, his estimate of 36,000 km comes quite close to the actual circumference known today. Ancient Indians also knew about gravitational force. This scientific expertise continued in later years as well. In the 18^{th} century, five Jantar Mantar astronomical observatories were established by Sawai Jai Singh of Jaipur and are situated in New Delhi, Varanasi, Jaipur, Mathura and Ujjain. The Jaipur observatory has the largest sundial in the world with a 90-foot-high projecting arm. These were used for studying movements of the Sun, Moon, etc. Other instruments built plot the course of heavenly bodies and the paths of stars, and predict eclipses. Thus, space as a science has been studied in India from ancient times and throughout its history; in fact the study of space and heavenly bodies has been part and parcel of Indian cultural and religious heritage.

MODERN SPACE ACTIVITIES

Right from the time of its independence on 15 August 1947, our country, under the able leadership of its first Prime Minister Pundit Jawaharlal Lal Nehru, who is considered as the father of modern industrialized India, realized the importance of science and technology for its overall development, considering its vast area and huge population. Soon after the launch of Sputnik by the former USSR in the year 1957, India realized the huge potential of space science and technology for its overall development. India thus adopted in 1958 a scientific policy resolution, which stated in general that the country's objective was "to secure, for the people of the country, all the benefits that can accrue from the acquisition and application of scientific knowledge". This statement demonstrated an awareness of the tremendous potential of space technology for national development, especially in the field of communications and resource management. In addition, with a view to achieving maximum self-reliance in the practical harnessing of space, a strategy for the Indian Space Programme was formulated by the late Dr. Vikram Sarabhai (also known as the father of the Indian Space Programme) in the early 1960s; according to him, the practical aspects of the space programme were most important. To quote Dr. Sarabhai: **"There are some who question the relevance of space activities in a developing nation. To us, there is no ambiguity of purpose. We do not have the fantasy of competing with the economically advanced nations in the explorations of the moon or planets or manned space flights. But we are convinced that if we are to play a meaningful role nationally and in the comity of nations, we must be second to none in the application of advanced technologies to problems of man and society, which we find in our country."** .

Thus the Indian space programme started in the 1960s with the establishment of the Thumba Equatorial Launching Station near Thiruvanathapuram for the investigation of the ionosphere using sounding rockets. Afterwards, the Indian Space Research Organization (ISRO) was established in 1969 under the Department of Atomic Energy. In 1972, the Space Commission and the Department of Space (DOS) were set up and ISRO was also brought under the Department of Space. Since then, India has reached an enviable position in the design, development and operation of space systems, as well as the use of systems for vital services like telecommunication, television, broadcasting, meteorology, disaster warning, natural resources survey and management activities. The Indian space programme has over the period become largely self-reliant with a capability to design and build its own satellites for providing space services and to launch them using indigenously designed and developed launch vehicles. Recently, India has acquired the capability to place satellites into geo-synchronous transfer orbits. *This has placed India into a select group of six nations in the world to have such a capability.* Today, India has made huge progress in this field and its capabilities represent a wide spectrum of expertise which ranges from conceptual design, to building and operating a wide variety of space systems that are comparable to the best in the world. India is thus recognized as a leader in space applications that have a wide impact on society. India's total self-reliance in the area of vital applications of space activities in the fields of communications, broadcasting, meteorology and natural resource information – which are of direct importance for national development – has secured India a unique place in the international community.

CHALLENGES FACING INDIA

India, the world's largest democracy, is a country of great diversity not only in its terrain but also with its people. Although India houses one sixth of the world's population, it is only slightly larger than one-third the size of the United States of America (U.S.A.).

The following are some of the vital statistics of India to show its enormous diversity and the resultant challenges it faces:

- India has 28 states and 7 Union territories.

- Total area: 3,287,590 sq. km. Land: 2,973,190 sq. km. Water: 314,400 sq. km.

- Land boundaries: more than 14,000 km, with Bangladesh, Bhutan, Myanmar, China, Nepal and Pakistan.

- Coast line: approximately 7,000 km.

- Terrain: upland plains (Deccan Plateau) in the south, flat to rolling plains along the Ganges River, deserts in the west, and the Himalaya mountains in the north.

- Elevation extremes: lowest point – Indian Ocean: 0 meters; highest point – Kanchanjunga: 8,598 meters.

- Natural resources: coal (fourth largest reserves in the world), iron ore, manganese, mica, bauxite, titanium ore, chromium, natural gas, diamonds, petroleum, limestone.

- Natural hazards: drought, flash floods, as well as widespread and destructive flooding from monsoonal rains, severe thunderstorms, and earthquakes.

- Environmental issues: deforestation, soil erosion, overgrazing, desertification, air pollution from industrial effluents and vehicle emissions, water pollution from pesticides, tap water not potable throughout the country, huge and growing population overstraining natural resources.

- Languages: English, Hindi and 14 other official languages.

- Literacy: a little more than half the population is literate.

- Economy: India's economy encompasses traditional village farming, modern agriculture, handicrafts, a wide range of modern industries and a multitude of support services; major exporter of software services and software workers.

- Gross Domestic Product (GDP) composition by sector: agricultural – 25%; industry – 26 %; services – 49%.

- Labour force: more than 400 million, with 60% in agriculture, 23% in services and 17% in industry.

- Electricity production source: more than 80% from fossil fuel, approx.14% from hydropower

- Communications: telephone – main line more than 30 million, mobile more than 3 million.

- Radios: more than 120 million. Television: more than 63 million. Internet users: more than 5 million.

- Transport: railway more than 60,000 km (more than 13,000 km electrified). Highways: more than 3 million km, waterways more than 16,000 km. Airports: 355.

SPACE ACTIVITIES: THE ONLY HOPE

India, like all other developing and poor countries of the world, is faced with the challenge of sustainable development within its limited resources. The reasons why maximum utilization of space activities is the only hope in the situation that India faces are not too difficult to guess. Two of them of them are:

1) (a) Tremendous pressure of population on the resources available;

(b) Environment degradation has increasingly worsened the situation.

Since the resources available are limited, the solution therefore lies with utilization of the available resources in a manner that can yield maximum benefit with as little wastage of resources as possible.

The Earth Observation (EO) satellites provide the vantage point and coverage necessary to study our planet as an integrated, interactive physical and biological system. The key areas where EO data are of use are global environment change monitoring, management of renewable and non-renewable resources, resource mapping, geo-positioning applications and also strategic applications of national security. In India these activities have been put to effective use in areas such as forestry, wasteland mapping, agricultural crop acreage and yield estimation, drought monitoring and assessment, flood monitoring and damage assessment, land use and land cover mapping, water resources management, groundwater targeting, marine resources survey, urban planning, mineral targeting and environmental impact assessment. Integration of thematic information on various natural resources – land use/cover, types of wastelands, forest cover/types, surface water resources, drainage patterns, potential ground water zones, geomorphology (landforms), geology (rock types, structural detail, mineral occurrence, soil types), etc. – derived from satellite remote sensing data, with other ancillary information, meteorological and socio-economic data, has helped to arrive at locale-specific prescriptions for development in a number of districts in the country. Maximum utilization of these techniques holds the only key to maximum utilization of limited resources in India.

2) India has already made remarkable progress in the field of space science and as such it is relatively easy to extend the area and volume of these activities.

3) Financial gains, which can be generated by commercialization of these already existing capabilities, particularly for other developing countries that do not have these capabilities of their own, can be a source of additional national income without requiring any special investments.

INVOLVEMENT OF THE PRIVATE SECTOR: AN ABSOLUTE MUST FOR ENHANCING SPACE BENEFITS

The Indian Space Programme, characterized by a vision to use space technology for national development, has been successful to a large extent in harnessing space technology to improve the quality of life at the grass-roots level and in playing a major role in the national development process.

Although everyone recognizes the vast potential of space technology to improve the quality of life of all humanity, still, due to a worldwide recession, even the most advanced countries like the United States of America have been forced to cut down budget allocations for space activities and are encouraging the private sector to invest in these activities to the maximum. Developing countries like India are far harder pressed to allocate funds for these activities. **Therefore the need for privatization of space activities deserves the maximum attention in countries like India, which need these activities even more than their richer counterparts for their national sustainable development.**

Accordingly, the Department of Space, Government of India, in its Annual Report 2001-2002 published its citizen charter.

THE CITIZEN'S CHARTER OF DEPARTMENT OF SPACE

The Department of Space (DOS) has the **primary objective** of promoting development and application of space science and technology to assist in all-round development of the nation. With this end in view, DOS has developed the following programmes:

(a) Launch vehicle programme – having indigenous capability for launching spacecraft.

(b) INSAT programme for telecommunications, broadcasting, meteorology, development education, etc.

(c) Remote sensing programme for application of satellite imagery for various developmental purposes, etc.

(d) Research and development in space sciences and technology and applications for national development.

The Department is committed to:

(i) Provide national space infrastructure for the telecommunication needs of the country.

(ii) Provide satellite services required for weather forecasting and monitoring.

(iii) Provide satellite imagery required for the developmental and security needs of the country.

(iv) Provide satellite imagery and specific products and services required for application of space science and technology for developmental purposes to the Central Government, State Governments, Quasi-Governmental Organisations, NGOs and the private sector.

(v) Promote research and development in space sciences and technology.

While implementing the above objectives, DOS will:

(a) Provide required transponders and facilities out of its own capacity and also hire additional capacity if needed.

(b) Register Indian satellite system for public and private sectors.

(c) Provide its products and services in a prompt, efficient and corruption-free manner to all the users/clients.

BENEFITS OF PRIVATISATION FOR INDIA

Despite arguments from some quarters in India that it is detrimental to national interests, the last decade has seen India reap rich dividends of the fruits of privatization and globalization. To cite just one example, India today is a force to be reckoned with in the field of computer software and computer literate manpower. Bill Gates of Microsoft recognized India's potential in his recent visit to the country, announcing an investment of 400 million US dollars, in addition to 100 million dollars for the charitable purpose of eradicating AIDS. The potential of India in the field of space technology is no less than in computer software and the technology has even greater potential to assist India's all-round development and progress. One recent example of the fruits of the marriage of privatization and space technology has been the discovery of the largest reserves of natural gas in southern India by the Reliance Group of Companies, a leading industrial house of India.

This need for privatization has not only been reflected in the Citizen's Charter of the Department of Space, but DOS has also laid emphasis on cooperative ventures with Indian industries in order to achieve self-reliance. There has been close association with more than 500 small, medium and large-scale companies with relation to procurement and contracts, transfers of know-how or provision of technical consultancy. Today, the Indian space industry is capable of handling complex manufacturing jobs and advanced technologies. Already more than 245 technologies have been licensed to industries for commercialization and more than 190 technical consultancies have been provided in various areas of space technology.

DOS has also formulated an industry participation policy to set the modalities, among other things, for identification of industries, utilization of human resources and facilities available within the DOS and incentives for industries to promote space technology. The policy is expected to aid in the growth of space industry in the country while allowing DOS to focus on advanced research and development activities. Indications have been given to the industry that by the tenth five-year plan, i.e. 2002-07, ISRO plans to transfer all activities up to the stage of 'final assembly' before launch to the private sector. ISRO and the Confederation of Indian Industries (CII) jointly organized "Space Industry Meet 2002" in June 2002 in Bangalore, in which 230 industries from all over India participated. A Joint Working Group of ISRO and CII is also in the process of being created.

Intellectual Property Rights

- The DOS patent portfolio includes more than 120 filed patents and copyrights, of which 59 patents and 5 copyrights have been granted.

Technology Transfer

- So far, 245 technologies have been transferred to industries for commercialization and 185 technical consultancies have been provided in different disciplines of space technology. A few additional technologies are at an advanced stage of licensing.

Export Promotion

- Antrix Corporation Limited is a wholly owned Government company under DOS that markets space products and services from ISRO and DOS itself. It has been making rapid strides in the export market. Antrix has been awarded the "Trophy for Top Exporter" under the category of "Exporters of Engineering Consultancy, Technical Know-how and Other Engineering Services" for four consecutive years. The Antrix activities consist of international marketing for remote sensing data from the Indian Remote Sensing (IRS) satellites. The marketing tie-up with Space Imaging U.S.A. and its global network of ground stations capable of accessing IRS data is expanding. Stations located in Oklahoma and Alaska (U.S.A.), Japan, United Arab Emirates, Republic of Korea, Ecuador, and Thailand are receiving data while many more are in the pipeline for receiving and processing IRS data. It also provides reception software to ground stations in Myanmar and Canada. A Memorandum of Understanding (MOU) has been signed with a Malaysian company for increased collaboration, including possible use of ISRO's launch services.

Thus, it is amply clear that India is amongst a selected few nations which have highly advanced space technology. India is undertaking numerous and complex space activities; its ambit of activity increases by the day. The present need is therefore for increased participation of the private sector in all types of space activities.

Thus, the involvement of private sector in space activities creates important responsibilities for the country that permits private space activities.

INTERNATIONAL RESPONSIBILITY OF INDIA FOR ITS PRIVATE SPACE ACTIVITIES

Article VI of the Outer Space Treaty of 1967 provides that States are internationally responsible for national activities in outer space, including activities pursued by non-governmental entities.

Article VII and Article VIII of the same 1967 Treaty, which find their elaboration in the Liability Convention of 1972 and Registration Convention of 1975, respectively, make it incumbent on all the States to regulate private sector activities for which they can be held accountable, responsible and liable as a State.

In view of the above, a State is internationally responsible for private space activities, if these space activities can be brought within the ambit of national activities in outer space.

So, the typical situation is that on the one hand all countries are strongly promoting and encouraging the participation of the private sector in their national space activities and, on the other hand, they are legally bound by international space law obligations to regulate, supervise and control private space activities in their respective countries. This situation can only be tackled by enactment of highly specialized national space legislation to control, regulate and register these highly complex and technical space activities of the private sector. **This legislation will not only meet the international space law obligations of the States but can also go a long way in attracting more participation by the private sector in view of the safeguards, incentives and transparency in procedures provided for in this legislation.**

Recognizing this, many technically advanced nations have developed detailed and specialized national space laws for various complex aspects of space activities carried out by the private sector in their respective countries, including a core licensing system for private space activities. These countries include the United States of America, Sweden, the United Kingdom of Great Britain and Northern Ireland, the Russian Federation, South Africa and Australia.

India today stands in league with and matches (to a large extent) these countries in technical advancement, but it lags far behind when it comes to having a proper specialized space legislation to substantively deal with the regulation of private space activities by means of a licensing system.

Although India does not have a specialized National Space Law, it does have "NORMS, GUIDELINES AND PROCEDURES FOR IMPLEMENTATION OF THE POLICY FRAMEWORK FOR SATELLITE COMMUNICATIONS IN INDIA" which were pronounced in the year 1999 by the Government, after being approved by the Indian Cabinet.

These broadly consists of:

1. NORMS, GUIDELINES AND PROCEDURES CONCERNING ALLOWING INDIAN PARTIES TO PROVIDE SERVICES INCLUDING UPLINKING OF TV SIGNALS WITH INDIAN SATELLITES.

2. NORMS, GUIDELINES AND PROCEDURES REGARDING USE OF INSAT CAPACITY BY NON-GOVERNMENTAL PARTIES.

3. NORMS, GUIDELINES AND PROCEDURES REGARDING ESTABLISHMENT AND OPERATION OF INDIAN SATELLITE SYSTEMS.

4. NORMS, GUIDELINES AND PROCEDURES REGARDING USE OF FOREIGN SATELLITES.

SPACE ACTIVITIES IN THE PIPELINE AFTER PRONOUNCEMENT OF NORMS, GUIDELINES AND PROCEDURES

With the pronouncement of the above norms, guidelines and procedures by the Government for satellite communication, broadcasting and direct-to-home TV channels, the market for telecommunication satellite and related services now holds vast potential.

Under this policy, private sector service providers are encouraged to own and operate a communication satellite. Antrix is exploring the possibilities of the manufacture and supply of telecommunication satellites, facilitating augmentation transponder capacity under the INSAT system for commercial use and necessary clearances for service providers, offering consultancy services for procuring, launching, operating and maintenance of communication satellites. Technical consultancy is being provided to a few Indian companies for satellite projects aimed at owning and launching a satellite into an Indian orbital slot. A Memorandum of Understanding (MOU) has also been signed with Videsh Sanchar Nigam Limited (VSNL) (a government owned company for international telephony) for collaboration to build communication satellite transponder capacity for use in all satellite-based services, as well as marketing to service providers. This MOU will enable Antrix and VSNL to converge on the requirements of a satellite that would ideally serve the multi-service requirements of VSNL and its customers and is expected to lead to a coordinated augmentation of the satellite capacity as early as possible.

SKELETAL PROVISIONS IN NORMS, GUIDELINES AND PROCEDURES GROSSLY INSUFFICIENT FOR EXPECTED ACTIVITIES

The provisions, as pronounced by the Government in the above guidelines, are very skeletal in nature and, in fact, can be at best termed as a "stop gap arrangement", which is anything but adequate to cater to the already multi-dimensional and ever growing private sector activities of India. **These can neither act as an effective control over the private sector's space activities as required by international space law, nor can they act as a form of guarantee to inspire confidence in the prospective private sector clients.** As already discussed above, it is in the national interest of India that maximum opportunity is provided to the private sector to invest in as many space activities as can be permitted, keeping in view defense and internal security requirements. It is also noteworthy to mention that, according to press reports, our Prime Minister has welcomed foreign investment to develop nuclear weapon programmes in India. In view of this indication, the sky could be the limit for the private sector's participation in Indian space activities.

ENACTMENT OF NATIONAL SPACE LAWS FOR INDIA SHOULD BE TOP PRIORITY

Interestingly, despite all the indications and policy of the Government to expedite the participation of the private sector in space activities, the response has been lukewarm. CII and the Federation of Indian Chambers of Commerce and Industry (FICCI) are the two top organizations of Indian industry. The fact that none of them has a special department or desk to deal with the subject of space industry goes a long way to suggest that a lot more needs to be done to attract and ensure much-needed participation by the private sector in Indian space activities. The fact remains that the private sector still finds India's space policy and activities too hazy for investment. Therefore, to give India's policy of involving the private sector in space activities the necessary boost, the following issues have to be addressed as early as possible:

(a) The international space law obligations of India;

(b) Inspiring confidence in the private sector by way of highly specialized legislation;

(c) Covering of all foreseeable aspects of space activities;

(d) Safeguarding the private sector's interest by way of statutory guarantees;

(e) Transparency in the licensing process;

(f) Special incentives by way of tax benefits and other mechanisms to attract investment, in line with the incentives given for development to poorer areas.

I. FUTURE COURSE OF ACTION

Although there is a national space law in the pipeline in India, there is also a need for this process to be expedited. In my opinion, in the peculiar situation that India finds itself today, there is an urgent need and requirement for specialized national space law.

In particular, the following specialized laws need to be enacted in India, which should also be indicative of special policy for encouragement of national space activities especially for attracting the effective participation of the much needed private sector and also to channel and rein in the numerous specialized space activities taking place in India:

1. The National Aeronautics and Space Act

This may be the basic legislation for all space-related activities in India. Through this, the Indian Parliament may declare the policy of India that activity in space be used for peaceful purposes only and for the benefit of all mankind. It should also spell out the purpose and policy of India for its enactment:

(a) Necessity for sufficient provisions for aeronautical and space activities for the welfare and security of India

(b) Creation of a civilian agency like ISRO in charge of all aeronautical and space activities, barring those peculiar to defense and security areas;

(c) Statement that the general welfare of India requires the civilian agency mentioned above to encourage to the maximum extent possible the fullest commercial use of space;

(d) These aeronautical and space activities are to be conducted with the objectives of expansion of knowledge of the Earth, the solar system and outer space;

(e) Enhancing the usefulness and overall efficiency of aeronautical and space vehicles, including making them capable of carrying goods and living organisms through space;

(f) Potential of space activities to be utilized to the maximum extent to control and minimize environmental degradation;

(g) Encourage specialized studies in this field and try to keep India in league with the most advanced nations in the field of space science and technology and other related fields;

(h) Cooperate with other nations for peaceful applications of space activities.

2. Legislation, rules and regulations to encourage the development of commercial space industry in India and other related purposes

This shall include the development of commercial satellite systems for the world as a whole in collaboration with other countries.

3. Legislation, rules and regulations for regular collection of land remote sensing data from space

This includes utilization of data in studying impacts of development on the global environment, managing the Earth's resources and planning other related activities.

4. Legislation, rules and regulations for patents in space, advertising industry, trade

Also regarding incentives for investing in space-related activities, space tourism industry.

5. Legislation, rules and regulation to encourage development and integrated use by public and private sectors of remote sensing and other geospatial information and for other purposes

6. Legislation, rules and regulations for development of the commercial space transportation industry, re-usable launch vehicles and re-entry missions and for other related purposes

Thus, it is apparent that although India has been in the forefront of technological advancement in the field of space activities, its progress has been relatively slow in the development of national space laws. But I am sure that India will soon also be a leader in the field of space legislation; the situation today might make this look as mere wishful thinking, but my statement is based on a solid reasoning.

The reason for my firm belief is the elevation of Dr. A.P.J Abdul Kalam as the President of India, who is also the supreme legislating authority of the country. Dr. Kalam was a key figure for 20 years in the ISRO and has been instrumental in the progress India has made in "leaps and bounds" in the field of space technology. Knowing his dedication to his work, the world can very well expect progress in the field of space legislation in "leaps and bounds" with him heading India's legislating authority.

In Dr. Kalam's own words: "Dream, dream and dream and convert these dreams into thoughts and later into actions." Also "think big", "We are a nation of a billion people and we must think like a nation of billion people, only then can we become big".

I think there can be no better guiding principle than this, to chart the future course of action for "The Indian Space Law and Policy".

INDIAN SPACE LAW AND POLICY

A PRIVATE SECTOR PERSPECTIVE

MODERN SPACE ACTIVITIES

- Dr. Vikram Sarabhai- Importance to Practical Aspects.
- Started in Early Sixties with Launch of Sounding Rocket.
- 1969 ISRO Established.
- 1972 Space Commission and DOS established.
- Today- Highly Advanced- Telecommunication, Television, Broadcasting, Meteorology, Disaster Warning, Natural Resources Survey and Management Activities.
- India in a Select Group of Six Nations in the World in this field

CHALLENGES FACING INDIA

- Diversity both in Terrain and People.
- Typical Developing Country Huge and Growing Population.
- Resources Limited -Economic Disparity between Rich and Poor- Huge Middle Class
- Economy Agriculture Based.
- Challenges of Environmental Degradation.

INVOLVEMENT OF PRIVATE SECTOR IS AN ABSOUTE MUST FOR ENHANCING SPACE BENEFITS

- Space technology -improvement at grassroots.
- India - financial shortage.
- Worldwide recession- cut in budget proposals.
- Maximum need for privatization -in countries like India- for advancement of space technology.
- Indian Space Policy -Citizen's Charter of DOS - emphasis on privatization

BENEFITS OF PRIVATIZATION FOR INDIA

- Benefits of privatization in- last decade.
- A big force in Computer software and manpower.
- Bill Gates invests $ 400 million.
- Reliance discovers largest Natural gas reserves.
- DOS- 500 industries -manufacturing works.
- Antrix corpn.Ltd.- top exporter-technical knowhow.
- Policy-private participation.

INTERNATIONAL RESPONSIBILITY FOR PRIVATE SECTOR ACTIVITIES

- Responsibility -International Space Treaties.
- National Space Laws -for private space activities.
- Safeguards and Incentives.
- Norms, Guidelines and Procedures -1999.

SPACE ACTIVITIES IN PIPELINE AFTER PRONOUNCEMENT OF NORMS, GUIDELINES AND PROCEDURES

- Private Sector Service Providers- encouraged to own and operate satellites.
- Possibilities -Indian companies-owning and launching satellites.

SKELETAL PROVISIONS IN NORMS,GUIDELINES AND PROCEDURES GROSSLY INSUFFICIENT FOR EXPECTED ACTIVITIES.

- Neither effective control nor inspire confidence- for private sector.
- Policy and need for privatization very much there.

ENACTMENT OF NATIONAL SPACE LAWS FOR INDIA TOP PRIORITY

- Important to Regulate planned Private Sector Activities.
- Encouragement to participate.

FUTURE COURSE OF ACTION

- Enactment of specialized National Space Laws.
- National Aeronautics and Space Act.
- Commercial Activities.
- Collection of Land Remote Sensing Data.
- Patents.
- Commercial Transportation Industry.

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AIR AND SPACE LAW

Overview of educational programmes in space law

Dr. Frans von der Dunk

Co-Director,

International Institute of Air and Space Law

Overview of educational programmes in space law

UN/IIASL Space Law Workshop

INTERNATIONAL INSTITUTE OF AIR AND SPACE LAW

Contents

1. What is 'space law' - what are we dealing with - why are we dealing with it?

2. Levels & standardised formats

3. Special formats

4. Scholarships

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What is ‘space law’? (1)

- Exclusively dedicated to outer space & space activities
  - International law
    - Five UN treaties; TBT?
    - Few non-UN treaties of ≈ general nature
    - UNGA Resolutions (& customary law)
    - Treaties establishing IGO’s
    - Special case: IGA on ISS
    - N.B.: no international ‘case law’…
  - National law
    - 9.5 states (under narrow definition)

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What is 'space law'? (2)

- Every legal regime relevant to at least one type of space activity
  - Telecommunications law ➔ satcom
  - Economic & trade law ➔ satcom; launching (?)
  - Intellectual property rights law (IPR) ➔ EO; space station
  - European Community law ➔ satcom; EO (?); satnav
  - MTCR & Wassenaar ➔ launching; satcom
  - Air law & ICAO: satnav…?
  - Law of the sea: launching from the high seas...
  - Financing & securities-related law ➔ indirectly

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What is 'space law'? (3)

- Interesting mix...
  - Of spatialist & functionalist regimes
  - Of general & specific regimes
  - Of international & national (& even EU) law
  - Of public & private law regimes
- …applicable to a very special environment viz. type of activities:
- **Space as the fourth environment for human activities (mankind)**

N.B.: ‘space activities’

- What are ‘space activities’?
  - Activities ‘in’ outer space
  - Activities ‘directed towards outer space’
- ‘Remote-control’ vs. ‘close-control’
- What is ‘outer space’?
  - Area above/beyond air space
    - *Where does it start?*
  - “Wherever space law applies” (i.e. “issue irrelevant”)

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Why teach space law?

- Increasing down-to-earth relevance
  - *Space as fourth environment for mankind*
- Fundamentals of law & law-making
  - Room for legal creativity & imaginativeness
- Interaction various legal regimes
  - 'Conflict of laws'
- For career purposes
  - Ref. increasing relevance!

Levels and standardised formats

- *Basic & introductory segments*
- *Graduate courses*
- *Post-graduate courses*
- *Ph.D./J.D. programmes*
- *P.M. 1: Capacity-building events*
- *P.M. 2: Practically-oriented (training) courses*

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Basic & introductory segments

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- In context of broader courses
  - E.g. law of international spaces, of IGO's, even general public international law
  - Many universities & other institutions
- Focus on 'classical' space law
  - UN treaties & Resolutions
  - Or just elements of space law: satcom for telecom
- Too narrow for real benefits...

Graduate courses

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- Sometimes combined
  - E.g. with air law; telecom law; law of the sea
  - Or with policy and/or economics
  - Low, but increasing number of universities
- Focus still on core space law, but:
  - Often enriched with 2nd focus, e.g. on telecoms, or on remote sensing

N.B.: Law in interdisciplinary courses
  - E.g. ISU Summer School

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Post-graduate courses

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- LL.M., DESS & others
  - McGill, Paris XI, Mississippi, Leiden IIASL
- Still combined with other subjects...
  - Air law; telecom law; remote sensing law
- …but covering ≈ all of space law
  - Treaties, Resolutions & IGO's
  - National law & interacting regimes
  - Often: bonus elements (projects; internships)

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The Leiden example

- Five major courses
  - Public air law; Private air law; Space law: treaties & lawmaking; Space law: applications, institutions & national law; European aerospace law
- Supportive courses
  - Law on IGO's; EU law; competition law
- Internship
- LL.M. thesis

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Ph.D./J.D. programmes

- Academically oriented (← → LL.M.)
  - Cologne; McGill; Leiden IIASL; others
- Individualised format
  - Need for a promotor
  - Need for a subject
  - Need for sufficient time...
  - Need for stamina & interest in academic career...

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Special formats

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- *Moot courts*
- *Summer courses*
- *Projects*
- *Website & Internet-related tools*
- *Internships*

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Moot courts

- Format
  - ➢ Takes up to a year (not full-time)
  - ➢ Supervised yet much own (team) effort
  - ➢ Focused on ‘practical’ skills & use of knowledge of the law
  - ➢ Written & oral efforts
- Manfred Lachs Space Law MC
  - ➢ Annually; organised by IISL
  - ➢ Currently 3 regions → preliminary rounds

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Summer courses

- Format
  - Relatively short (few weeks) & intensive
  - Usually at least in part hands-on/practically oriented
  - International group of participants
  - Varied teachers/instructors
- ECSL Summer Course
- ISU Summer Course

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Projects

- Format
  - Exx.: int'l negotiations; drafting of law/treaty; arbitration
  - By definition hands-on & practically oriented
  - Building on team spirit & co-operative effort
  - Leading to some sort of visible end-result
- Ex. Leiden LL.M.
  - National space policy & law
  - The Case of the Norwegian National Space Law

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Website & Internet-related tools

- Databases & search engines
- Exchange of opinions & knowledge
- Distance/blended learning
  - Use of Internet
    - Documents; analyses; lectures
    - Possibility for interactive learning...
  - Allowing studying at home - for larger part…
  - …but personal/direct contact remains crucial

Internships

- Ultimate in hands-on experience
- Individualised formats
  - As to length
  - As to tasks performed
  - As to remuneration (or not)
  - As to host
    - Leiden experience: governments; IGO's; companies; law firms - as long as with substantial space (or air) law component
- Best jumping board for career...

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Scholarships - a few tips (1)

- Start long in advance
- Search broadly:
  - Internet
  - Websites hosting organisations
  - Governmental agencies
  - Embassies & consulates
    - Look for bilateral (exchange a.o.) agreements
  - IGO's: UN, UNESCO, specialised IGO's
    - Look for educational programmes & support

Scholarships - a few tips (2)

- Not all eggs in one basket!
- Include some self-funding!!
- Try to get preliminary approval by programme/course & other support
- Calculate tuition fees + reasonable living expenses
- Get present/future employer interested

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Scholarships - governmental action

- Analyse need for expertise...
- Look for possible nat’l & int’l funding/sponsoring/scholarship options…
- Develop own funding capacities…
- *…and at least make inventories widely available...*

Overview of educational programmes in space law

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Educational Programme at the University of Miami School of Law

Sylvia Ospina, J.D. LLM

The University of Miami, founded in 1925, is the largest private university in Florida, with nearly 14,000 students in several Colleges, Schools or faculties. There are 100 undergraduate programs, 85 Master's and 55 doctoral programs or areas of study. The University of Miami itself has students from more than 140 different countries as well as from nearly every State in the US.

The University of Miami School of Law was established in 1928. At present it has approximately 1170 J.D. students. More than 50% of the J.D. students are women, and approximately 30% are members of minority groups. Students at the University of Miami School of Law come from nearly every State in the nation, and from a significant number of countries. The students have a wide variety of backgrounds in many fields—engineering, biology, literature, political science, sociology, medicine, etc.

In the United States, students entering law school must have completed a bachelors' degree prior to studying for the Juris Doctor (JD) degree, which requires an additional three years of study. The Law School also has three joint-degree programs, enabling students to obtain a JD as well as a Master's in business administration, public health, and marine affairs.

The School of Law has a strong focus on international and comparative law. Of particular importance is that 50% of the faculty has significant experience in teaching or writing in international and comparative areas. With a large percentage of its students fluent in Spanish as well as in English, the School of Law is perhaps the only law school in the U.S. that regularly offers courses and seminars on international and comparative subjects taught in Spanish.

The School also excels in taxation and business law, and has a nationally recognized litigation skills program. Another strength of faculty scholarship lies in its analysis of how law relates to contemporary social problems; much of the research the faculty does has a strong interdisciplinary bent.

In addition, the University of Miami School of Law offers seven LL.M. programs, which attract more than 130 students a year, from every region of the world. Three of the LL.M. programs, in taxation, estate planning, real property development, focus on domestic law, though some attention is given to international and comparative law. Four programs, in comparative law, inter-American law, international law, and ocean and coastal law, focus on international and comparative law. The LLM in Comparative Law regularly draws 40 to 50 foreign lawyers from around the world who come to Miami to study U.S. and international law for a year.

All J.D. students take the same basic required courses in their first year. Second and third year students have a rich variety of courses from which to choose – some 130 courses or seminars. They may decide to concentrate in particular areas of study, although there are no formal concentrations. More than 40 of the upper-level courses deal with international and foreign legal issues and law, ranging from Admiralty, Aviation, European Community Law, International Human Rights, International Business Transactions, International Environmental Law, The Law of The Sea, Latin American law, and since 2001, Space law.

Seminar on the regulation of space activities

The seminar on the regulation of space activities is a complement to several other seminars offered at the University of Miami School of Law, such as admiralty, aviation, maritime / Law of the Sea, and international environmental law. These areas involve legal issues related to global commons and the commercial use thereof, and thus, national law and international treaties are examined. Further, these fields address issues similar to those in space law: definition /delimitation of air space, of territorial waters; responsibility and liability for damages; registration (of aircraft, ships, spacecraft), environmental issues (terrestrial and space debris).

The seminar on the regulation of space activities encompasses more than merely "space law". The seminar is divided into three aspects (technical, economic, and legal), at three levels (international, regional, and national). Thus, space activities are examined taking into account the UN treaties and principles, but also legal documents of other UN agencies, such as the International Telecommunication Union's Constitution and Convention and Radio Regulations, and the WTO Agreement on Telecommunications. Regional and national laws and policies that affect the development and deployment of particular sectors are also discussed, also taking into account their technical, economic, and legal aspects.

US national policies and legislation that have had global impact, particularly in regard to satellite communications, are examined. The first such legislation is the 1962 Communications Satellite Act, which led to the establishment by treaty of INTELSAT, and eventually, of INMARSAT and EUTELSAT. The US law (the ORBIT Act of 2000) that led to the privatization of these international intergovernmental service providers is also addressed. Other space activities, such as the commercialization of launches under the US Commercial Space Launch Act, and agreements related to the International Space Station are also referred to.

Teaching method or approach:

There are probably as many approaches to teaching space law as there are space lawyers, and the emphasis they will give to a particular aspect of space activities will depend on their own specialty or inclination. Since satellite telecommunications are my specialty, I tend to discuss this subject at greater length than other space activities with which I am less familiar. Also, as I have worked with several entities (private corporations as well as international organizations) involved in either the regulation of satellite communications or providing services, I can illustrate particular points, and provide examples based on my professional experience.

The students are expected to have some background and interest in international law. Since this is a seminar, the students are required to write a paper on a topic of their choice related to space law, and to make a short verbal presentation of their paper. One purpose of this exercise is for students to learn to do research involving international organizations (UN, ITU, WTO, INTELSAT, ESA, ECSL, CITEL, CEPT, etc.) It is also a good exercise for them to formulate their thoughts and positions, and state them in a coherent fashion.

Class discussion is encouraged, as a means of ensuring that the students are reading and understanding certain basic materials, such as the space-related treaties, and that they are familiar with "current events" as reported in Space News and other periodicals. In addition, the students are encouraged to become familiar with the Proceedings of the IISL Colloquia and other journals. (My personal preference is to have them read current periodicals, which talk about real day-to-day situations, and relate these events to space treaties or principles, national / regional law or policies.)

One great advantage that most students have today, which I did not have as a law student, is access to the INTERNET, to so many websites across the world! The drawback to the plethora of information available is keep up with the students, to stay one step ahead of them!

On a more personal level, a big challenge (and desire) is to have more students enrol in my seminar. However, I face formidable competition: nearly 130 other courses from which to choose! Thus, how to spread “the word” that this seminar is worth attending, that it will make a difference in their choice of professional goals? One way is by talking with other faculty members, talking to student organizations (e.g., the student ILA), and having the students talk to other students.

Ideally this seminar should be an inter-disciplinary endeavor, co-taught with professors from other faculties, and available to students in other departments, such as engineering, business administration, and communications / media. Further, if it were a two-semester course, the technical, economic and legal aspects of space activities could be addressed more fully, to the benefit of all involved.

Presentation on the Educational Programme of the European Centre for Space Law (ECSL)

Sergio Marchisio
European Centre for Space Law
Professor at the University of Rome "La Sapienza"

1. Introductory remarks

The topic of my presentation, included in session 3 concerning the educational programmes in space law, will be the European Centre for Space Law (ECSL) and its activities. If our common understanding is that in each country the successful operation of space law, policies and institutions relies on the presence of suitable professionals, therefore, educational opportunities and institutions that address the subject of space law and policy are a vital element[1]. Within this context, I will deal with the contribution of the ECSL's activities to that end, following the outline prepared by the chairman Gabriel Lafferranderie, who has been unable to attend the workshop.

The title of our session concerns "educational programmes" in space law, which is of course a broader concept than "university studies or courses on space law". Indeed, one of the main aims of this workshop is to consider the development of university level studies/programmes in space law with a view to promoting national expertise and capability in the field. This is why I would like to make it clear at the outset that the European Centre for Space Law (hereinafter "the Centre"), which formally commenced its operations on 12 May 1989, is not a law faculty or an institute of law or political science studies, nor an establishment in which students can follow courses and obtain qualifications [2]. Notwithstanding, it is an important institution working in the sector of space law educational programmes at the European level.

2. The story of ECSL within the framework of ESA

If we go back to the story of ECSL, we can easily understand why the Centre is not and could not be a faculty or an educational establishment in a proper sense. Its original scope went further than that; its objective was to bring together the people involved in space law, strengthen what already existed and provide assistance in implementing initiatives of the European Space Agency (ESA) created by the Convention signed in Paris in March 1975.

The ESA Convention is of course a product of history, it's a child of its time, and its clauses and articles are a response to the historically specific questions posed by those who drafted it. ESA took over from the European Space Research Organization (ESRO), established in 1962, and the European Launcher Development Organization (ELDO)[3]. Its main aim was to play a federative role in Europe in the area of space research and technologyand their applications. In this regard, it suffices to mention Article II of the ESA Convention, concerning the purpose of the Agency: it stresses on cooperation among

[1] See generally Tania Masson-Zwaan and P.H. Tuinder, Space Law Training and Education, Outlook on Space Law over the Next 30 Years, p. 285.
[2] The Centre's main unit is located at the European Space Agency (ESA) Headquarters, 8-10 rue Mario Nikis, 75738 Paris 15, France.
[3] See Krige, An Historian Looks at the ESA Convention, in Proceedings Florence, 1993, pp. 13-18.

European States in space research and technology and their space applications by implementing a long-term European space policy[4].

That ESA should also help coordinate national efforts in the field of space law was a natural extension of this work. Once created, ESA had become an actor within the international space community and particularly within COPUOS and its Legal Sub-Committee[5]. The structure of the ESA Council's subsidiary bodies included a body responsible for following up international activities, now the International Relations Committee (IRC), which had been mandated to prepare Member States' positions concerning matters addressed by international organizations, and hence by COPUOS.

With the time, the contribution of ESA to the development of space law had become evident. I can only mention a few points:

ESA and the organizations that had come before, such as ESRO, had negotiated international agreements that covered issues of international liability for damage, the registration of space objects and the status of astronauts (this was the case for the Intergovernmental Agreement on conduct of the Spacelab programme and various agreements and MOUs on programmes carried out in cooperation with NASA);

ESA, urged along by its legal adviser, Dr Kaltenecker, later Dr Bourely, had pressed for adoption in December 1977 of a Council Resolution on international liability for damage caused by space objects. Prior to that, he had also requested that ESA adopt Declarations of acceptance of UN space treaties wherever possible (Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space; Convention on International Liability for Damage Caused by Space Objects; Convention on Registration of Objects Launched into Outer Space; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies), adding the principles concerning direct television broadcasting or remote sensing of the Earth from space.

So space law was from the beginning part of ESA's legal culture and ESA contributed to the framing and application of that branch of law[6].

3. The need for an ECSL

By the end of the eighties, the creation of a European Centre for Space Law, in an ESA framework, had clearly become essential. It was evident that the Agency would have

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[4] The purpose of the Agency shall be to provide for and to promote, for exclusively peaceful purposes, cooperation among European States in space research and technology and their space applications, with a view to their being used for scientific purposes and for operational space applications systems,

a) by elaborating and implementing a long-term European space policy, by recommending space objectives to the Member States, and by concerting the policies of the Member States with respect to other national and international organisations and institutions;

b) by elaborating and implementing activities and programmes in the space field;

c) by coordinating the European space programme and national programmes, and by integrating the latter progressively and as completely as possible into the European space programme, in particular as regards the development of applications satellites;

d) by elaborating and implementing the industrial policy appropriate to its programme and by recommending a coherent industrial policy to the Member States.

[5] See Gabriel Lafferranderie and P.H. Tuinder, The Role of ESA in the Evolution of Space Law, 1994, Vol. 22, p.97.

[6] See Lafferranderie, The European Space Agency (ESA) and International Space Law, Proceedings Perugia, 1999, pp. 19 ss.

gained directly from such a step, since it was conducting space programmes, which raised issues of space law for the Agency itself, both as user and decision-maker.

A new impetus came from the negotiations on the international space station. The range of legal issues broadened and, above all, it became apparent that the solutions would entail States making direct legal commitments (not just on traditional issues like liability for damage, cross-waiver of liability, the status of persons aboard, intellectual property, access to and exchange of data, settlement of disputes, but also on new fields like criminal jurisdiction).

It was well perceived, on one side, the importance of the "jurisdiction and control" principle, which was, not without some difficulty, included as a guiding principle in Article 5 of the 1988 Intergovernmental Agreement on the space station (IGA), and, on the other side, the importance of the influence of the ownership and registration concept.

This new phase involved thinking about and drawing up legal guidelines and showed the need for machinery, both at the Agency and in the Member States that would bring together the various parties, as well as the lawyers, scientists and policy-makers.

Out of these requirements came the idea of setting up ECSL, of putting in place a flexible instrument, open to the various communities, law faculties, political science research institutes, scientists, company lawyers, practitioners, academic community and students[7].

The idea was firstly proposed to delegations in 1988 and then to an assembly convened in October of the same year to discuss it and adopt a Charter[8].

We all known the few people without whose support the project would never have come about: Professor Lüst, at the time ESA's Director General, Mr Van Reeth, Director of ESA's Administration, delegations, not forgetting those who first thought up the project, Professor Böckstiegel, Doctor Lafferranderie, Professor Lyall, Professor Zanghì, Doctor Bourély, Mrs Masson-Zwaan and others.

4. The objectives of ECSL

The objectives of ECSL, or challenges should I say, are of course set out in the Charter, as amended by the General Assembly held on 15 June 2001. Let us refer to its preamble and to Article 2.

The preamble sets forth some important ideas and principles. I should mention three of them.

First of all, the growing complexity of the sources of space law, both international and national, both of hard and soft law, and, as a consequence, the difficulties of an access to documentation; secondly, the multidisciplinary character of space law, which includes both the rules related to access to and use of outer space and the means for organising and executing space-related activities on Earth, rules of private and public character; further, the steady enlargement of the space users community, as developer users, operators, and its needs.

[7] M. Bourély, A European Space Agency Initiative. Creation of the European Centre for Space Law Research, Annals of Air and Space Law, McGill, 1989, vol. XIV, p. 219.
[8] Gabriel Lafferranderie, Launch of the European Centre for Space Law, Journal of Space Law, Vol. 17 no. 2, p. 170.

A sum of valid reasons for setting up a European Centre for Space Law, in order to improve the state of space-law research and knowledge in Europe, for the benefit of academics, students, practitioners, and also to improve the image of ESA.

The thread running through the whole project, and which was perhaps the reason for its success, was a resolve to avoid an unduly formal and over-centralized structure, and to go instead for a flexible one, making it possible to contribute to and benefit from exchanges and coordination.

This would serve the needs of space law teaching and application. The result of exchanging ideas, thoughts and documentation should be progress for all - lawyers and non-lawyers alike -, progress in terms of professional development and the formulation of legal policies.

In its turn, Article 2, concerning the main purposes of the Centre, introduces the idea of ECSL as a complementary tool in Europe in the field of space-law research; as promoter of knowledge of and interest in the law relating to space activities through the promotion of research activities, including the dissemination of information and the organisation of workshops.

Then, the same Article gives to ECSL the role of identifying themes related to space law in which university research and training at degree, doctoral and post-doctoral level be encouraged, and areas of space-related activity in which regulation seems appropriate, and to discuss and propose principles and draft norms which may then be promoted at national or European level. In this regard, I can mention the very recent and well-received study on the question of the space debris legal regime presented by ECSL in April 2002 at the last session of the COPUOS Legal Sub-Committee in Vienna.

5. The ECSL National Points of Contact and other institutional issues

Finally, ECSL has been identified from the beginning as an instrument for promoting the establishment and development of national centres for space law research, giving them technical and other advice and constitute in this manner a European network. This is the main way for encouraging the direct exchanges between the members and their organisations, especially through the establishment of "National Points of Contact (NPOCs)" in the ESA and ESA co-operating States. The NPOCs, who act as links between end-users and the ECSL administrative unit located in Paris, are, at the moment, present in nine ESA Member States: Austria, Belgium, Finland, France, Italy, the Netherlands, Spain, Switzerland and the United Kingdom. There is also contact with Portugal, while Sweden used to have a NPOC.
NPOCs are free to organize their work as they see fit, while adhering to the Charter and keeping the Centre's secretariat informed of their activities; support can be requested from the Centre for individual events (colloquia, semi-finals of the Moot Court Competition, etc.).

This part of my presentation was needed to emphasize Europe's specific approach to the topic of the ECSL educational programmes: *a*) the presence of an intergovernmental research organization (ESA); and *b*) a legal culture constituted as a promising basis on which to build further.

The link between ESA and ECSL is evident if you look at the membership rules. Membership of the Centre is open to natural and legal persons from ESA Member States, Associate States, and other European States having concluded a co-operation Agreement with ESA and who are interested in the development of space law and who accept the Charter. For instance, members may be: European institutes and other academic bodies, individual academics, and members of European national administrations and space organizations; ESA itself and its staff, other European international institutions, or persons there from; persons from European private-sector organizations and European law firms; and private individuals from ESA Member States, European co-operating States and Associate Members.

ECSL does not have legal personality; it is not an ESA establishment or sub-agency. Where its operation does call for a legal base, it relies on ESA's legal personality. As far as the structure is concerned, Article 5 says that the organs of the Centre are the two-yearly General Assembly, whose main purpose is to establish guidelines, the Board and the Secretariat.

The support from ESA, its "neutrality" but "support", is thus essential and contributes to ECSL's cohesive force. Therefore, for its financing, the Centre receives a contribution from ESA, but also membership fees and voluntary contributions from certain agencies.
Other services to which ECSL has access should also be taken into account, such as the printing of documents (proceedings of colloquia, ECSL newsletter).

6. The ECSL educational programme

I would like now to present more in detail the ECSL educational programme, the services offered to the academic community, beginning with the participation in the Moot Court and the summer course on Space Law and Policy.

Moot Court : European preliminaries and semi-finals.

The most important programme realized by ECSL is of course the organization of the European round of the Manfred Lachs Moot Court Competition, which participants always recall with great enthusiasm. In this regard, a distinction is to be made between the activities of the Centre and those of the NPOCs, though they often overlap.

One general observation that derives from this ECSL experience is that European participation may appear insufficient in terms of numbers, mainly for a problem of language; not all European students have sufficient proficiency in English, whereas their legal knowledge is excellent. Another requirement is finding dedicated, able coaches and time.
ECSL organizes the semi-finals in Europe, either at ESA Headquarters or in a European law faculty; it covers the costs and also the expenses of the team taking part in the finals. A colloquium on a specific topic will usually be held at the same time as the semi-finals. In 2002 these activities have been organized in Spain, at Jaen University; in 2003 they will take place at the Macerata University, in Italy.

Summer Course on Space Law and Policy

Another important event is the Space Law and Policy summer course, organized every year jointly by a European law faculty and the Centre. This is an intensive two-week course, attracting students from some 15 universities in about 10 ESA Member States. The host country normally changes every year. The activity having begun in 1991, 11 universities have so far hosted the course (Messina, Italy; Toulouse, France; Aberdeen, Scotland; Cologne, Germany; Geneva, Switzerland; Brest, France; Rovaniemi, Finland; Granada, Spain; Nice, France; Leiden, the Netherlands; and La Rochelle, France). The venue next year will be Louvain La Neuve, in Belgium.

The main aim of the Summer Course is to contribute to the development and the diffusion of legal, political and economic matters about space activities. Academics, technicians, governmental consulting and students coming from the ESA Member States attend summer courses.

The courses are given by lawyers and professionals: they have included personalities from the UN Space organs, like the Office for Outer Space Affairs, the COPUOS and its Sub-Committees, professors from universities in member or non-member countries, legal experts from international organizations, space agencies or ministries, practicing lawyers, scientists, and engineers.

Lectures are characterised by three main aspects:

1. they provide general knowledge, looking at space law basic principles and texts;

2. special fields and actual practice are examined, in depth, such as commercialisation and privatisation of space activities, basic principles governing space competition, remote sensing and its applications, telecommunication legal regime, the role of international organizations as actors of space law, and so on;

3. students then prepare for mock pleadings (of the Moot Court type) or mock negotiations for an intergovernmental agreement. This is an exercise, which, though not easy, is very popular, as it gives students the impression of being responsible for handling an actual case for the first time. During the last Course in La Rochelle, particular attention has been devoted to the Galileo Project, the European project for satellite navigation.

ECSL publishes special compilations of documentation for the summer course's participants and the Summer Course's Proceedings, which constitute a useful instrument for teaching activities in space law.

ECSL usually covers the accommodation and travel expenses of the teaching staff, the students' travel expenses (they are given university accommodation) and the cost of printing course material. The faculty will contribute accommodation, catering, lecture halls, library access, and computer facilities. Students make a small contribution to expenses. In the early days, we were able to register the course under the Erasmus/Socrates scheme, but that has unfortunately not been possible for some time now.

7. Activities directed towards practitioners

The Practitioners' Forum

Since 1992, one of the most important events of the ECSL activities has been the organisation of the yearly Practitioners' Forum. The Forum is a yearly gathering of practicing lawyers and professionals, to which students can have access.

The meeting is intended to fulfil the need for practitioners to have an opportunity to meet expert lawyers practicing in the field of space activities, who can provide them with an update of their knowledge and information in this area. It is a one-day session, which takes

place at the ESA headquarters in Paris, during which specialists present the last development in special fields of space law and related matters, like telecommunications, EC law, contracts and procurement law, liability, insurance, each presentation being followed by a question/discussion session. This forum is very informal and none of the papers are published, therefore allowing participants complete freedom of speech and of exchange of views.
The next Practitioners' Forum will focus on "The Galileo Project", analysing the aspects related to the joint undertaking set forth by the EU Council regulatory framework in 2002 and impacts on the economic, financial and insurance sectors.

ECSL Regional Workshops in developing countries

Starting from 2001 ECSL initiated a new activity of regional workshops on space law, in furtherance of the numerous UNCOPUOS recommendations calling for the organization of capacity building activities in developing countries.

This new ECL activity began with a first workshop organized at the request of the Royal Moroccan Centre for Remote Sensing in Rabat and attended by more than 80 professionals and practitioners from several African countries. This was a clear demonstration of the growing interest in space in developing countries[9]. The first day was devoted to some basic principles of space law; the second dealt with concrete questions associated in particular with remote sensing and telecommunications and a presentation of the Charter on the management of major disasters. It is important to underline the particularly interactive and animated discussions and the open and sincere exchange of views.

The second workshop, which has dealt with "Remote Sensing for Sustainable Development: Legal Aspects", has taken place in Tunis on September 2002, co-organized by ECSL and the Regional Centre for Remote Sensing of Northern African States (CRTEAN), that is an intergovernmental organization based in Tunis and grouping several Northern African countries. It aims at promoting the development of remote sensing activities of Member States and at encouraging the implementation of regional projects on remote sensing applications. As for training activities, CRTEAN is engaged in coordinating related initiatives at all levels. In co-operation with competent national institutions, it is in charge of the establishment of high-level training programmes for citizens of Member States. The Centre also organises national and regional seminars, conferences and other scientific initiatives in the field of remote sensing.

I would like to mention a particular aspect of that initiative. As a part of the ECSL workshop, a drafting group, composed of Northern African countries and European countries, has drafted a document in form of a declaration to be submitted for the participants' approval at the end of the workshop. The Declaration has defined the needs and the expectations of the Northern African countries on the issue of remote sensing and could be used as a starting point, among other documents and studies, for future discussions on the matter. In this sense, the new methodology adopted by ECSL has been largely fruitful.

8. Other ECSL activities

Among the other ECSL activities, I may recall:

the organization of workshops and legal colloquia, attended by prominent specialists of space law, like the Colloquium at Charles University of Prague in 1997 on Legal Aspects of Cooperation between the ESA and Central and Eastern European Countries and the

[9] Specially in remote sensing activities: see Gabriel Lafferranderie, ECSL Activities in the Area of Protection of Satellite Produced Remote Sensing Data, Journal of Space Law, Vol. 20 no.1, 1992, p. 83

Colloquium at University of Perugia in 1999 on International Organisations and Space Law: Their Role and Contribution;

the publication of the ECSL Newsletter, which covers various space law topics and contains information about the activities of the Centre;

ESALEX, ECSL's database that includes the databases of its NPOCs and the libraries of the Leiden and Cologne University. It is at present being readapted and it will shortly be updated and made more user-friendly.

9. Europe and space law teaching

It is encouraging to see that after a reciprocal learning phase, there is now more and more teaching of space law at a high level in European faculties, like the outstanding pioneering work of the Institute of Air and Space Law in Cologne and the International Institute of Air and Space Law in Leiden. A *DESS* is now offered at the Law Faculty of Sceaux in France and a similar qualification at London's Queen Mary College. There is also the teaching of different professors at European Universities like Brest, Jaen, Rovaniemi, and others, without whose dedication ECSL would not be where it is today.

I would like to take the occasion, being professor at the University of Rome La Sapienza, of saying a few words about the educational activities of my University in that field. Like a common feature, I can say that in Italian universities, space law is more often considered a special part of other legal disciplines than an autonomous course of study. Space law is often taught within the courses of international law, like in the well-known University of Padoua, or of air and navigation law, as in Trieste, Bologna, Naples and Genova Universities.

Rome La Sapienza has a long-standing tradition of academic studies and research activities in space matters that date back to the beginning of the sixties. In fact, the establishment in 1993 of the San Marco Project Research Centre (CRPSM), organized as a Departmental Centre of the University, represents the continuation of the San Marco Project that, instituted in 1962, marked the beginning and the earliest substantial development of Italian space activities. The San Marco Project as well as, subsequently, the CRPSM, has always endeavoured to elaborate and actively pursue joint co-operation programmes with NASA and several Italian/international organizations, the European Space Agency (ESA), Italian Air Force, National Research Council, and Italian Space Agency (ASI), not to mention various universities.

The CRPSM is currently engaged in: research projects conducted autonomously; scientific and technological research programmes in collaboration with domestic and international organizations; development and optimisation studies of BSC technological resources; support operations for scientific and technological programmes carried out at its Telemetry, Tracking, & Command, and Remote Sensing Stations. As for teaching and training activities, the CRPSM is currently engaged in academic activities in the field of space research and training activities under an agreement with the Ministry for Foreign Affairs and the Italian Space Agency.

The University of Rome La Sapienza has developed two Master Degree Programmes on space issues: the Satellites and Orbiting Platforms Master, and the Remote Sensing Master.

Both are more engineering oriented, but thanks to a co-operation agreement with the Department of public law of the same University they include a modular course on space law and policy.

Traditionally the University of Rome “La Sapienza” also offers a course on Airspace Law, for the first level studies (Laurea). The Course take place yearly, on a semi-annual basis, within the Public Law Department, at the Faculty of political science and diplomacy, open also to the Law Faculty’s students. Despite its official denomination, the Course is mainly devoted to international and national (comparative) space law. It includes two parts, on general issues and specific issues. Finally, the Course focuses on national legislations in space law and national space agencies, especially as far as the Italian legislation and the Italian Space Agency are concerned.

10. The results of 12 years of activities

So said, let me conclude coming back to the ECSL. Nine active NPOCs, conferences, workshops on developing countries, colloquia, the summer courses attended by over 450 students, some of whom have taken up posts with national space agencies or the private sector (insurance, service providers). This, it has to be acknowledged, does not really go far enough, since it is not yet possible, in the USA, Europe or elsewhere, to build a career on space law alone. It is however another string to the bow of international law. International law, comparative law, private law, commercial and insurance law, patent law, and so on - this is the growing field. The flow of knowledge from one to the other must be encouraged, and teaching staff, students and the public made aware of it.

In the European region, an organisation like ESA clearly has a role to play in informing and building bridges across disciplines, but this is very much its own role.

All of this provides space law students with everything they need for their studies. The requirements, I stress, are sound knowledge of international law, dedicated teachers, broad legal documentation; contacts with the private sector, such as practising lawyers. ECSL is one example, which undoubtedly meets the needs of the European context.

Workshop on Capacity Building in Space Law

18-21 November 2002

The Hague – Netherlands

Session 3 Educational Programmes in Space Law

The Educational Programme of the European Centre for Space Law (ECSL)

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The European Centre for Space Law (ECSL) and its activities

- The Centre formally commenced its operations on May 12 1989.

- It is not a law faculty or an institute of law or political science studies, nor an establishment in which students can follow courses and obtain qualifications.

- It is an institution working in the sector of space law educational programmes and providing assistance in implementing initiatives of the European Space Agency (ESA, Convention signed in Paris in March 1975)

ESA Role in Space Law

- ESA main aim was to play a federative role in Europe in the area of space research and technology and their applications.

- ESA should also help coordinate national efforts in the field of space law as a natural extension of this work.

- ESA had become an observer and actor within the international space community and particularly within COPUOS and its Legal Subcommittee.

- The contribution of ESA to the development of space law had become evident.

The need for an ECSL

By the end of the eighties, the creation of a European Centre for Space Law, in an ESA framework, had become essential.

- A new impetus came from the negotiations on the international space station.

- Out of these requirements came the idea of setting up ECSL, as a flexible instrument, open to the various communities, law faculties, political science research institutes, scientists, company lawyers, practitioners, academic community and students.

- The proposal was submitted to an assembly convened in October 1988 to adopt a Charter.

Charter of ECSL, as amended on 15 June 2001

- Principles embodied in the *preamble*:

- growing complexity of the sources of space law, both international and national;
- multidisciplinary character of space law;
- steady enlargement of the space users;
- role of ESA to facilitate the exchange of scientific and technical information.

ECSL Charter

Article 2:

- ECSL as promoter of knowledge of and interest in the law relating to space activities (i.e., study on space debris 2002, COPUOS LSC).

The ECSL National Points of Contact (NPOCs).

- ECSL as an instrument for promoting the establishment and development of national centres for space law research and giving them technical and other advice.
- Present in nine ESA Member States.

ECSL institutional features

- Membership open to natural and legal persons from ESA Member States, Associate States and States having concluded cooperation agreements with ESA
- ECSL relies on ESA's legal personality
- Organs: two-yearly General Assembly, Board and Secretariat
- Financing: contribution from ESA, membership fees, voluntary contributions
- Located at ESA Headquarters in Paris

The ECSL educational programme

- **<u>Activities directed towards students</u>**

- A) The Manfred Lachs Moot Court Competition: organization of the European semi-finals, either at ESA headquarters or in an European Law Faculty, with a colloquium on a specific topic;
- ECSL covers the costs of the team taking part in the final round at the yearly World Space Congress

The ECSL educational programme

- **Activities directed towards students**
- B) The Summer Course on Space Law and Policy (from 1991)
- Attended by academics, technicians, government consulting and students from ESA Member States
- Lectures provide general knowledge and examine special fields
- Students prepare for mock pleading

The ECSL educational programme

- Activities directed towards practitioners.

- A) The Practitioner's Forum (since 1992)
- A yearly gathering of practicing lawyers and professionals to provide them with an update of their knowledge and information
- One-day session on latest developments in special fields of space law
- Informal character of the Forum open to discussion and exchange of views

The ECSL educational programme

- Activities directed towards practitioners.
- B)Capacity building: ECSL Regional Workshops in developing countries
- 1. Workshop on Space Law and Remote Sensing, Rabat, Royal Moroccan Centre for Remote Sensing, attended by 80 professionals and practitioners from several African countries
- 2. Workshop on Remote Sensing for Sustainable Development: Legal Aspects, Tunis, Regional Centre for Remote Sensing of Northern African States

Other ECSL activities

- Organization of workshops and legal colloquia (i.e., Prague, 1997; Perugia, 1999)
- ECSL Newsletter
- ESALEX, the ECSL's database. It includes the databases of NPOCs and the libraries of the Leiden and Cologne Universities.

ECSL, Europe and Space Law Teaching

- There is now more and more teaching of space law in European faculties (IASL in Cologne; IIASL in Leiden; *DESS* at the Law Faculty of Sceaux and at London's Queen Mary College; teaching at various European Universities like Brest, Jaen, Rovaniemi, etc.)
- Space Law teaching and research activities at the University of Rome "La Sapienza"
- The 1993 San Marco Project Research Center (CRPSM): joint cooperation Programmes with NASA, ESA, Italian Air Force, National Research Council, and Italian Space Agency.

<u>Conclusions</u> : The results of ECSL 12 years of activities

- International law, comparative law, private law, commercial and insurance law, patent law: the flow of knowledge from one to the other must be encouraged.
- The requirements: sound knowledge of international law; dedicated teachers; broad legal documentation; contacts with the private sector.
- ECSL is one example, which meets the needs of the European context.

Space Law Database

S. Negoda

Ukraine

Introduction

The age of the information society, which for some years confidently progressed in countries with advanced economies and by whose parameters less developed countries aspired to live, has received an essential jump in many respects due to the introduction of space technologies in human society.

Information systems create previously non-existent precedents in communication between people, they give huge advantages to various branches of activity to the people. A lot of spheres of modern economic activities have developed, and are leaders, due to such phenomena as fast data transmission, global telecommunications systems, and the Internet. Thanks to the Internet, human knowledge is accessible in various corners of our planet. Also thanks to information technologies, such inconvenient phenomena, as duplicated scientific research, are starting to be erased more and more. The concept of "a global village" literally becomes more of a reality year-by-year.

Moreover, some hitherto traditional fields of activity, such as international trade, are born on a qualitatively and essentially new level by information technologies. Speed of data transmission and also global availability of informational databases have dramatically changed this important area by significantly compressing the time involved in the conclusion of deals. Thus, skilled traders today often spend just 2-3 weeks on the negotiation and conclusion of contracts on the sale of goods. And it is important to note that it is more common now than ever that parties involved do not meet either before the deal or during it. They simply use the Internet and traditional means of a guarantee on the financial safety, provided with norms of international law and bank tools.

The scientific world has been quite anxious to use the advantages provided by information technologies. It is time for the development of appropriate models, to make the scientific information accessible worldwide. We have to think on how to develop tools allowing scientists and practitioners to process the given information, and thereby, effectively cooperate and exchange opinions, considerably accelerating not only the process of learning new information and materials, but also the development and faster implementation of the practice of new scientific concepts and techniques.

This presentation is devoted to generating existing knowledge in the sphere of informational development of the science of space law and to bring your attention to the general structure of the database called "Space Law Database". We do hope that with the help of this database, scientists and practitioners can in the foreseeable future, increase the level of scientific research and develop effective models of legal regulation of international and national space activities.

Review of the status of informational development of space law

First, we would like to clarify what we understand as the term "informational development". In the context of the given report, informational development of space law (international space law and national space legislation, also corresponding scientific research) means the creation of an effective system that could give researchers accessible, objective and exhaustive information (textual, i.e. texts of statutory acts, analytical, scientific, etc.). It also means promoting the distribution and popularization of this information, in every possible way.

We shall look at the development of the spread of knowledge and the informational development concerning space law. Perhaps the basic and most effective sources of generating creative processes and the spread of knowledge about space law are the annual sessions of the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) and the annual Colloquiums held by the International Institute of Space law (IISL). Institutes of air and space law at McGill University, Leiden University and University of Cologne have, in the due course, made significant contributions in this sphere.

In the 1990s, important sources of information related to space law have arisen due to the enthusiasm of COPUOS and IISL. We can mention in this regard the annual "Highlights in Space" and "IISL Bibliography". In spite of the fact that the specified sources were created on the basis of traditional media such as books and brochures, their importance appeared significant as the specified structures covered a wide audience that was interested in questions on space law. Therefore, the information issued within the framework of these structures quickly reached scientists and practitioners.

For a while, those sources of information were extremely progressive and effective and are still, in the majority, quite effective. However, developments of the new national "space" norm are growing exponentially. The scientific materials and growth of the number of people who are to some extent interested in questions on space law add to the complicated distribution of the information and its full availability. From our point of view, it is necessary to use those advantages that are offered to us with the informational era.

This was understood in the Office for Outer Space Affairs (OOSA), where already from the middle of the 1990s, people began to use the Internet actively to spread knowledge. So, OOSA created and developed an Internet based library, which includes exhaustive information on space law-making activities of the United Nations. Besides, in years the given library has actively replenished the texts of the national statutory acts used for legal regulation of national space activities.

Space law related databases and Internet

In the beginning of the 1990s, when view of the Internet and its philosophy was essentially different, there were some databases including information concerning space law. However, we can characterize the given stage as rudimentary, and with the development in the middle of 1990s of the modern Internet, those databases have ceased to exist.

Also, it is necessary to note that the active creation of informational work fully or partly performed with the use of Internet was done by Cologne Institute of Air and Space Law, and the International Center for Space Law (Kiev, Ukraine). For two years materials were gathered and published in a multi-volume collection called "Space Legislation of the Countries of the World". One should also mention work on creation of information space law-related databases performed by the state bodies of the various countries: The National Space Development Agency of Japan (NASDA),The British National Space Centre (BNSC), The United States of America National Aeronautics and Space Administration (NASA), and the National Space Agency of the Ukraine (NSAU).

However, all the work mentioned above has a number of deficiencies:

1) It is not coordinated, or at least not adjusted, from a common ideological centre; in this connection the general informational picture of a modern space law looks non-systematic;
2) Frequently specified bases are incomplete;

3) Quite often the database of collected materials mirrors individual interests of the founding organization too much, and in this connection it is impossible to fully understand even law-making and regulatory picture of the activities of the founding organization. The picture may be fully understood by internal staff but not always by researchers who visit the database on the Internet.

Apart from the specified resources, it is necessary to note the highly professional work of the Archimedes Institute, and also websites supported by Professor Armel Kerrest.

And still, the specified resources are essentially separated within the space of such an enormous informational corpus as the Internet. Besides, at the formation of the databases, it is difficult to see the common philosophical outline, which most likely can be explained by the limitation of opportunities of authors in gathering materials.

IISL has attempted to solve the problem of dissociation of Internet-based resources. IISL had collected on its web site 148 references to space-related and space law-related Internet resources (November 2001).

The experience of IISL web site development gives us the following curious information - from February 6 until November 5, 2002, the site was visited by 933 persons (using Web terminology, Individual Clients). Considering some parameters (quantity of IISL members, quantity of probable visitors from the organizations directly engaged in space law-related matters and returning visitors (approximately 350 persons), etc.), it is possible to assume that from the specified number of visitors approximately 200-300 persons are neither professionals in the sphere of space law, nor representatives of the space industry, but only persons who are interested in questions of outer space exploration or international law.

The specified figure suggests that when developing a plan for informational development of space law, it is necessary to pay attention to the audience. This is really important as today an increasing quantity of "nonprofessionals" interested in issues related to space law is observed. From here it follows that today we should put great efforts to the dissemination of space law, and also to the creation of materials accessible and understandable to broad audiences.

The information reviewed above does not relate directly to the theme of our report, however, as we analyze a theme on the spread of knowledge and the Internet, we could not bypass it, and we would like to attract the attention of a respectful audience to this fact.

Space Law Database

After we have attempted to describe the advantages of informational development of space law, and also have reviewed the status of the given question, we would like to draw your attention to the general structure of the database developed by us, and called "Space Law Database".

In our opinion, today one of the most important tasks of space law (here we mean international space law and national space legislation) is the systematic studying of norms of the national legislation used at the legal regulation of space activities.

Today, we are witnessing the tendency of not simply the development of separate "space" norms in national legislation, but the development of legal provisions on space in various branches of law. This is one complexity of the norms that are closely connected to norms of other branches of the national legislation. Such a picture can be observed in the USA, the Russian Federation, and Ukraine. European Union Resolutions also apply in their own way, not only as simple regulators of separate types of space activities, but as an attempt to set a common legislative and organizational framework for the specified activities.

Time does not permit me to give too much attention to scientific aspects of the problems of national space legislation. These problems are actively and professionally analyzed by a number of outstanding scientists. Today it is well known that it is necessary to keep up steadfastly the conformity of provisions of national space norms to principles of international space law. Even though in some cases of international commercial space projects, the norms of international space law do not receive due respect because of an overactive use of national legal regulation. Also, we can support the new tendency in scientific research, which is aimed at the problem of unification of certain national space-related norms of all states - participants in the exploration and the use of outer space.

Today many scientists perform research using the Internet. However, such research is essentially complicated for several reasons:

1) In spite of the fact that today in many countries there is a planned and harmonious system for updating databases of national legislation, these bases are badly submitted on the Internet or are inaccessible to the broad audience of researchers for obvious reasons (language barrier, paid access, etc.);
2) Even if the researcher has received access to the bases described in item 1), he could not always conduct effective research because, for instance:
- language issues apply rather often; in many databases even short abstracts of laws and regulations given in English or French are not available,
- for different reasons (bad systematization or navigation) it is difficult to find norms devoted particularly to regulation of space activities in these databases,
- the researcher is not always familiar with issues such as the legal system of the researched state, specificity of law-making activities, interrelation of norms of branches of law, system of governmental management, etc.; the specified factors essentially complicate research and sometimes it could lead to wrong results and conclusions achieved at the end of research;
3) Even if there are space law related databases established in the WWW environment (we would like to mention in this regard the brilliant job done by the by Brazilian Space Agency - the comprehensive collection of national space-related norms published on their Web site), it is usually not so simple a task for a researcher to locate such resources on so vast and boundless an informational source as the WWW.

In connection with the aforesaid, it is possible to draw the conclusion that at the existing level of informational development of space law, it will be more complex, in the course of time, to carry out research in the given sphere. This inevitably will result in the reduction of efficiency of scientific proposals and legal regulation of space activities.

General Structure and Implementation of the Space Law Database

In order to construct an effective informational and analytical database devoted to national regulation of space activities, it is necessary to build a multi-level system of numerous participants. In a sense of execution and support, the system need not demand big expenses in materials or human work. However, a presence of a permanent group of experts or organizations that would systematically operate the creation of the database is important. Also, such bodies will be responsible for regular uploading of the database.

The overall objective of the creation and function of a database should be the achievement of the harmonious, volumetric and operative information on a subject of legal regulation of national space activities in the different countries.

Thus, it is important that the base always update information not only from one but all its sources. So, for example, it is important to provide due receipt of analytical materials and documents from those states in which the appropriate norms are developed for the first time(or there is a law-making progress in sphere examined by us). It can be provided due to global distribution of the information on presence of a resource (for example, universal popularity of the Web address where the database is published, or publication of analytical materials in one authoritative magazine).

Also, a huge role could be played by OOSA and COPUOS (participation in co-ordination of the work of gathering and ordering of materials, analytical work, popularization of the database, etc.), and also IISL (attraction of members to preparation of analytical essays, their encouragement to gather and transfer texts, information etc.). It is desirable, that the creation and function of a database is carried out within the framework of the international organizational system, which would include such components:

1) an international center (either a group of persons, or an organization), providing a methodical management on gathering, generating and ordering of the information;
2) regional centers, similar to that described in point 1), but with an accent on regional specificity;
3) an institute, which would be responsible for effective distribution and popularization of the collected and processed information, and also for gathering of responses from users of the information.

Also, the examined informational system should have such features as:
1) *general availability* - any researcher, so wishing, could receive comprehensive, systematized - and most importantly - operative information, irrespective of where she or he is located geographically;
2) *uniformity* - the analysis and ordering should be carried out in accordance with the established template;
3) *usability*- the information should be easily understood, it should be supplied with necessary comments that would help it be understood and apprehended by any researcher, whether she or he has special knowledge of a state system, economic and legal system of the examined country or not, or even if she or he does not have too deep a knowledge in space law.

Now is the correct time to proceed to the consideration of that work which for today is made by the group of experts in creation of the database of national space legislation.

Project name: Space Law Database.
Project sponsor: "Space Policy" magazine.
Project coordinators: Mrs. Frances Brown, Dr. Frans von der Dunk, Mr. Sergei A. Negoda.
Main Idea and Goals: to spread knowledge and understanding of the national legislative environment which is applicable to space activities regulation.

- To introduce to the scientific and practicing community to a professionally organized analysis of the national legal regulation of domestic space activities,
- To improve the understanding of the corresponding national legislative environment and legal mechanisms,
- To create a global picture that can show interrelations of norms of national space legislation of different countries,
- To show an impact of national space legislation development on the status of norms of international public space law,
- To make texts of analyzed national norms available to research by any interested party.

Project implementation: The most professional author(s) from each space-faring country will contribute a comprehensive analysis of space-related legislation of her/his country. An analysis must cover not only "direct" laws and regulations, but also such norms that could be used in the legal regulation of space activities (constitutional law, civil law, commercial law, national defense law, etc.). An analysis will create the comprehensive picture of a legislative environment and legal regulation of space activities of a particular country. *The Analysis will be published in "Space Policy" magazine quarterly.*

Then a special Web site will be created where the following sections will be presented:

1) *Scientific.* Collection of abstracts of analyses published in "Space Policy"

2) *Informational.* Here the texts of legal norms reviewed or mentioned in analyses will be published.

3) Discussion *Board.* This section will be moderated by a selected person(s) and will consist of on-line and off-line discussions between professionals on subjects related to national legal regulation of domestic space activities.

Content: analytical articles dedicated to national legal regulation of domestic space activities will be combined into the following groups and dedicated to the following topics:

N 1. 1) Brazil, 2) Argentina, 3) Chile.

N 2. 1) Japan, 2) People's Republic of China.

N 3. Russian Federation.

N 4. United States of America.

N 5. 1) Australia, 2) Canada.

N 6. 1) United Kingdom, 2) France.

N7. Countries of Western Europe (Germany, Italy, Sweden, Norway, Spain, the Netherlands).

N 8. Countries of Central and Eastern Europe (Austria, Czech Republic, Hungary, Romania, Bulgaria, Poland, Greece).

N 9. 1) Ukraine, 2) Republic of Kazakhstan.

N 10. Countries which have developed or are developing their own national space-related legislation (India, Republic of Korea, Indonesia, South Africa, and others).

N 11. 1) European Union, 2) Commonwealth of Independent States.

N 12. International space organizations (their role in international law making).

N 13. International space projects (their impact on international public space law and their role in development of space-related international private law).

N 14. Overview of development of and updates in previously analyzed legislation.

N 15. Project results, conclusions and recommendations.

Structure of analyses: All analysis will be done in accordance with an agreed template. These articles should not only give a description of national space-related legislation, but should also show a live picture of legal regulation. Such analysis will also be called on to assist in future jobs connected with the improvement of the international legal regime of exploration and the use of Outer Space, and to be a base for possible jobs aimed toward unification of certain provisions of space-related norms of different countries.

Each analysis will include the following points:

- political and economic structure of a country,
- description of legal system,
- history of national space activities,
- subjects of space activities,
- state management of space activities,
- description of space-related norm(s),
- connections of space-related norm(s) with other branches of national legislation,
- international obligations of a country with regard to activities in the field of exploration and use of outer space,
- implementation of international obligations listed in the above point,
- pros and cons of space-related legal regulation,
- prospects for space-related legal modernization and law making in a country.

At the end of each analysis, there will be a comment written by a project coordinator. This comment will review the analysis presented, evaluating the following points:

- level of effectiveness of state management in the area of space activities,
- how comprehensively existing space-related norms cover all aspects of space activities
- level of significance of legal regulation of space activities by norms of other branches of national space legislation,
- how deeply and correctly international space-related obligations of a country are implemented into national legislation,
- definition of provisions which should be improved in order to be unified with similar provisions of space-related legislation of another countries.

Expected results: First of all, we expect to achieve all goals listed above. We also hope to test the Internet based on a globally accessed joint collaboration with the involvement of numerous professionals. This experience will create the precedent for other similar legal scientific projects. Thanks to modern telecommunications utilities, the task of managing a big scientific group comes to reality.

Finally, with the assistance of the Project Web site, we expect to evaluate the effectiveness of a scientific discussion of related topics, which will be performed through the discussion boards. Such a tool could be extremely useful, establishing a sort of non-stop conference. We will derive more results with this technique, since preliminary opinions and conclusions of participating professionals will be accessible for a wide audience and available for discussions.

The proposed database combines two main features of modern life – it brings all professionals together, thanks to modern telecommunications, and it makes possible global availability of achieved results, thanks to the Internet. It will make information and results of scientific research generally available – the thing we scientists are working for!

We were glad to bring this project to the attention of a respectful audience and we do hope that the issues described herein will be useful for professionals present here today.

ISU Activities in Space Law

Philippe Achilleas

ISU part-time faculty in Policy and Law

Director of the Institute of Space and Telecommunications Law (University Paris 11)

ISU Programs

Specific Character : "3 - I"

International:

<u>Students :</u> 25 to 30 nationalities per session, Alumni in 82 Countries
<u>Faculty & Lecturers</u> : at the front edge of Space development in all parts of the world
<u>Perspectives :</u> Space Activities of All Nations, International Cooperation/Competition

Interdisciplinary

All disciplines and their interactions discussed in any space project
Students with graduate level in any field can apply

Intercultural

Take all Cultures into account:
Consider impact of cultures on Space activities and Team work

ISU Programs

- Master of Space Studies, MSS - 11 months
- Summer Session Program, SSP -2 months
- Professional Development Programs - 2 to 10 days
- Symposia, Forums and Workshops: *Examples for 2002:*

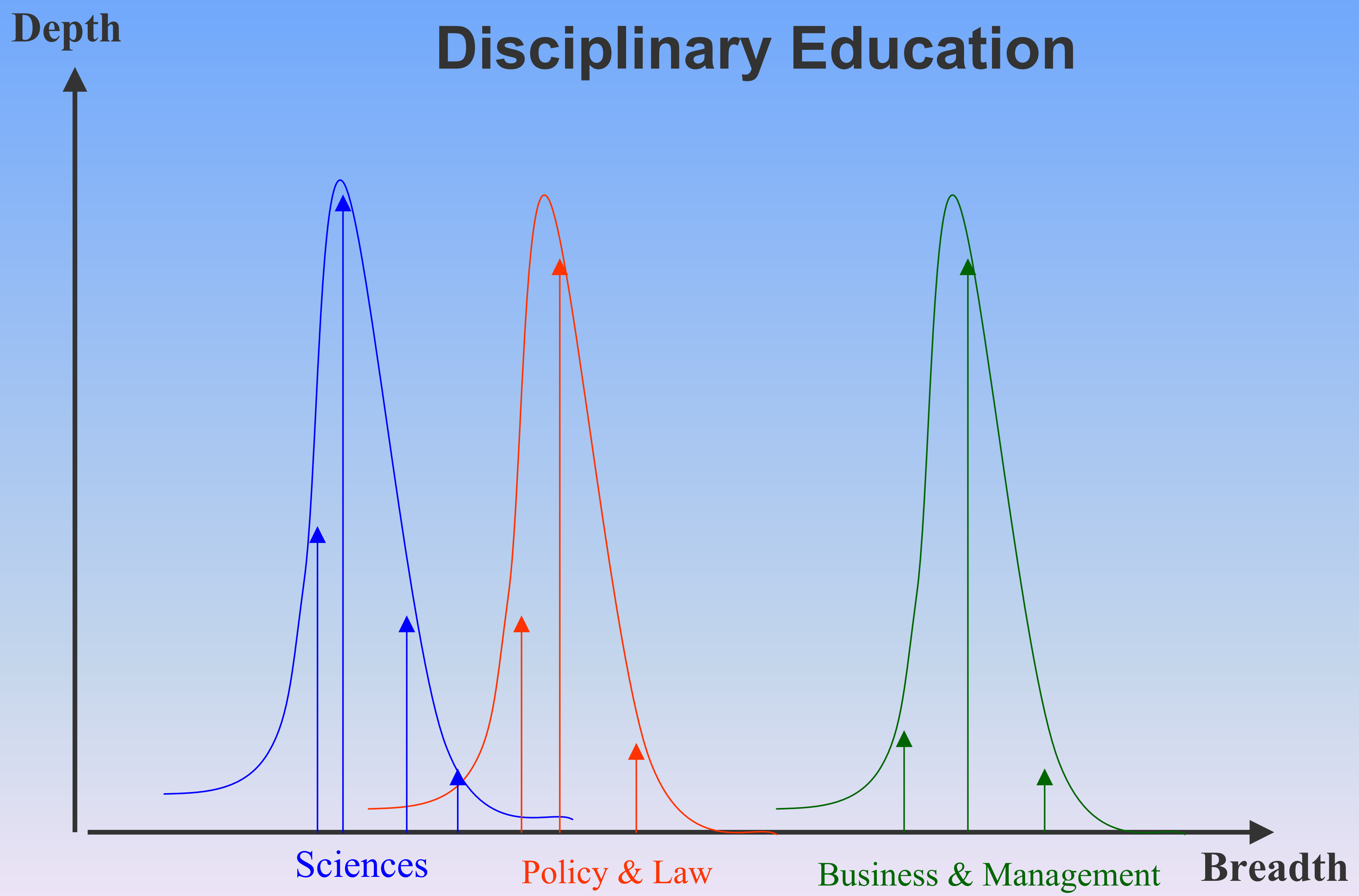
  - ISU: Beyond the International Space Station: The Future of Human Spaceflights

  - "Space Application for Heritage Conservation" at Strasbourg

  (ISU with UNESCO, EURISY, ESA, NASA, Council of Europe,...)
- Research Activity
- Joint Ph.D program - 3 years

“3-I” Education Concept (1)

Disciplinary Education

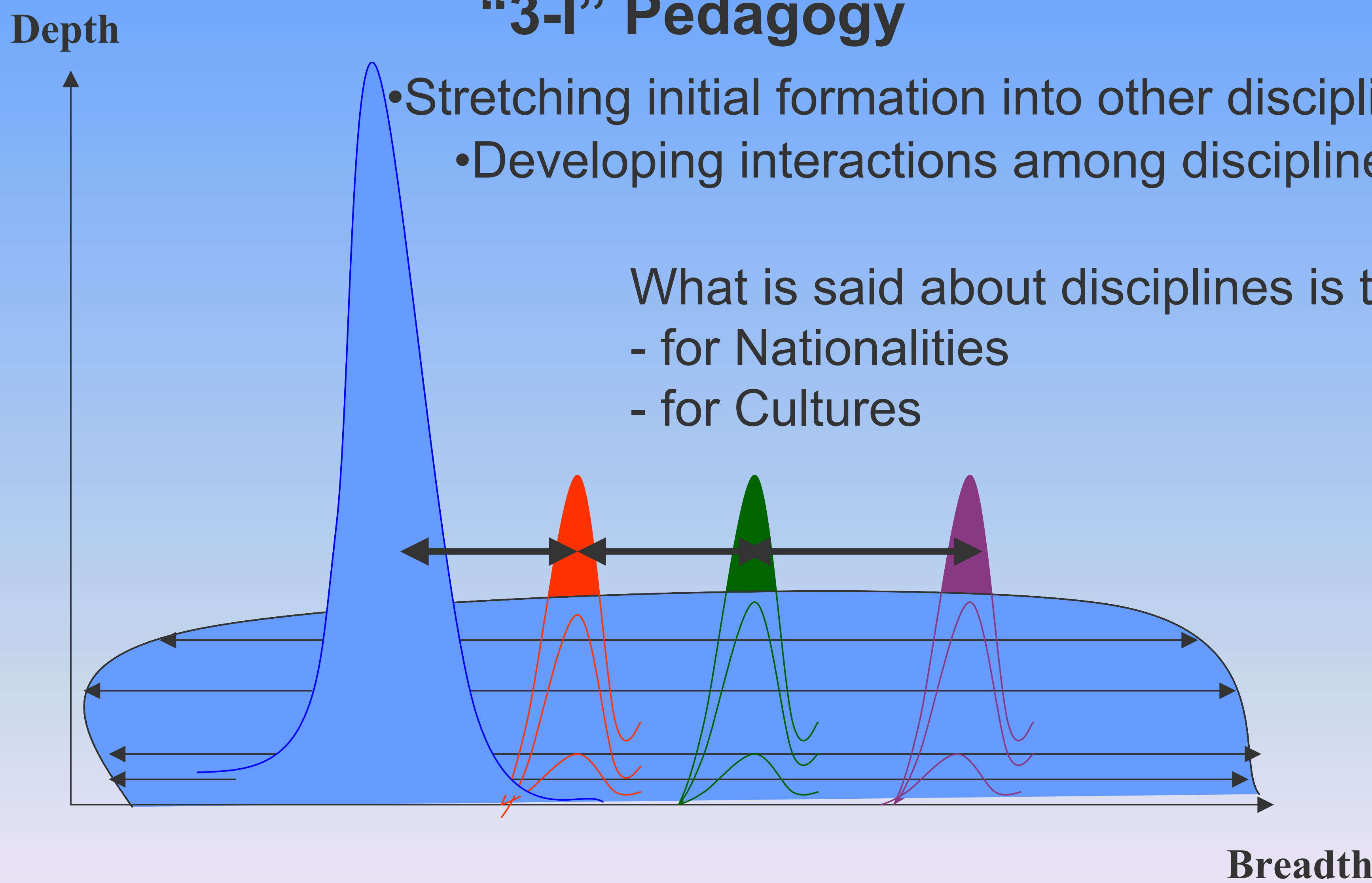


“3-I” Education Concept (2)

“3-I” Pedagogy

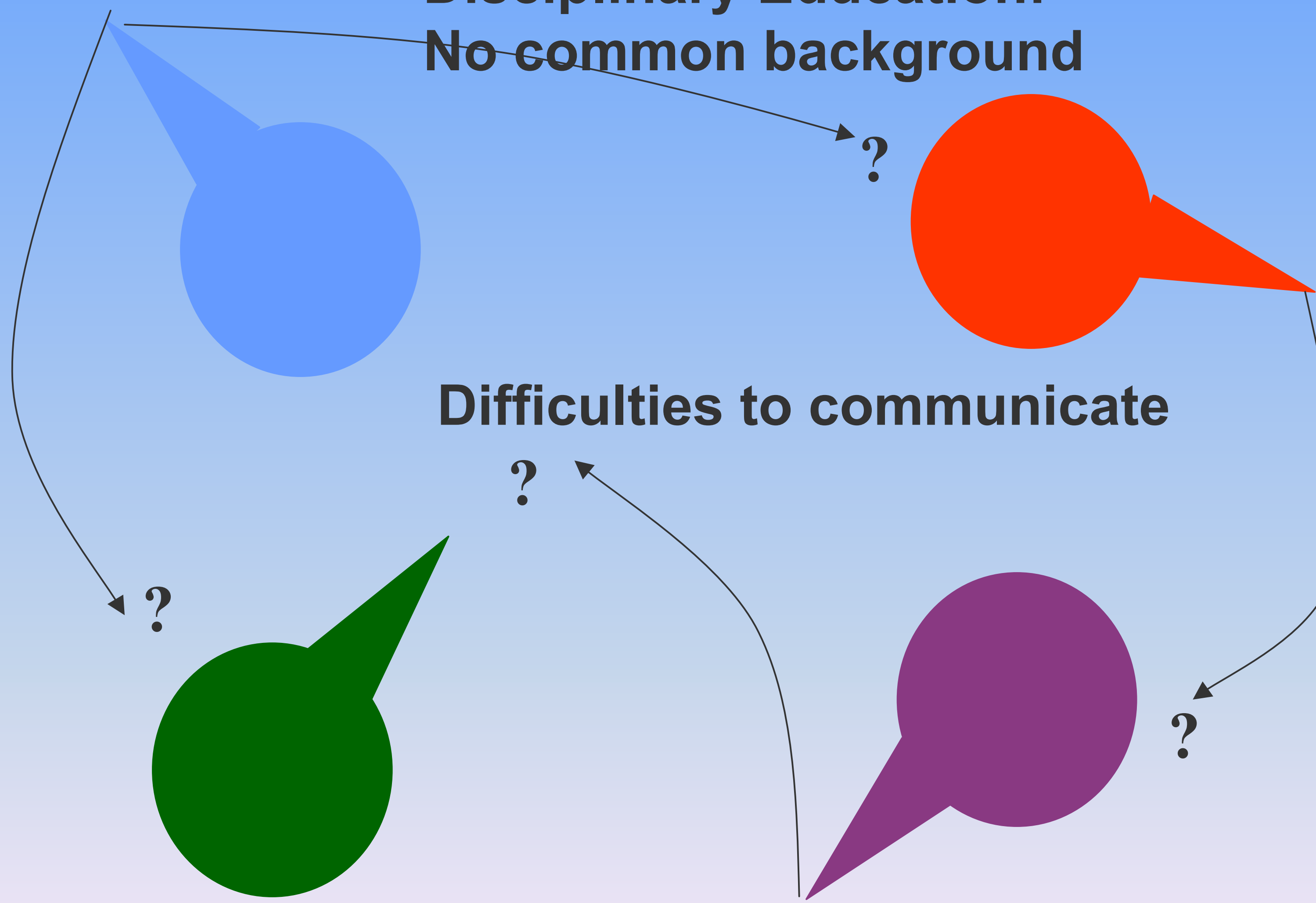
- Stretching initial formation into other disciplines
  - Developing interactions among disciplines

What is said about disciplines is true
- for Nationalities
- for Cultures



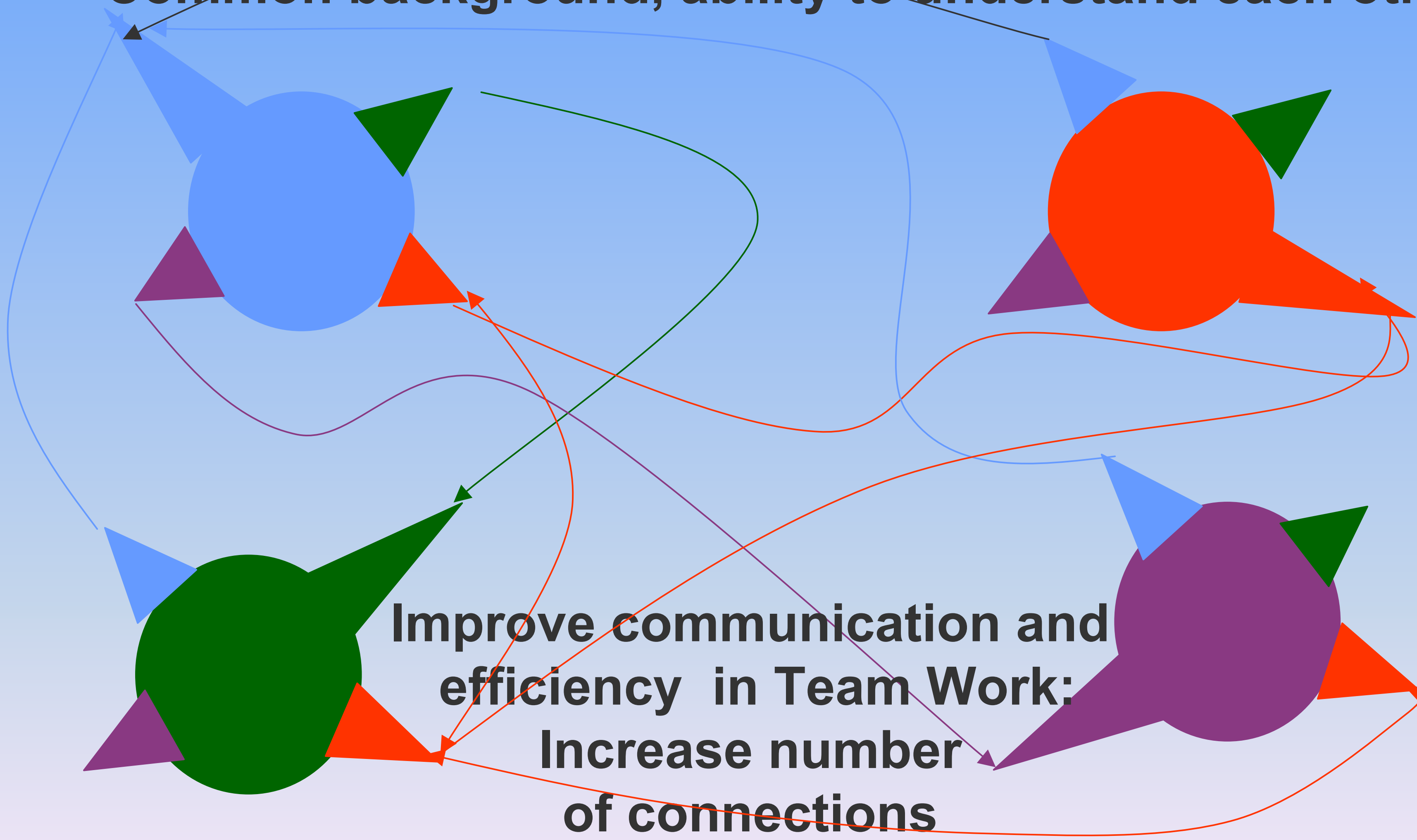
Added Value (1)

Disciplinary Education:
No common background



Added Value (2): "3-I" Education

Built up of knowledge in all space related disciplines: Common background, ability to understand each other



Improve communication and efficiency in Team Work: Increase number of connections

MSS & SSP

MSS

- Master of Space Studies: an 11 month graduate studies program held at the permanent campus in Strasbourg, France
- 5 modules
- Includes a 12 week internship in a space organization
- (recognized by ULP)

SSP

- Summer Session Program: a 2 month intensive program held in a different location every year
- First half core lectures & second half design project
- Theme days on key space issues
- (Graduate Credits from CSU (USA)

Teaching staff and lecturers from around the world

Participants from 25 to 30 countries from varied backgrounds

Master of Space Studies (MSS)

- Policy and Law classes represent 25 % of the curriculum
- Classes include seminars and worshops
- Space law curriculum includes; space law, telecomms law, intellectual property and contractual law
- Placement in legal department of companies and institutions

special events

1. Moot Court Competition in collaboration with the European Court of Human Rights
2. Simulation of COPUOS negotiations

Summer Session Program (SSP)

• Located at a different host site around the world each year
• Provides an ideal Forum to forge relationships with distinguished space professionals and to become part of the ISU
Network as an alumnus

• Policy and Law department
• Professional visits (e. g. Sea Launch facilities)
•Team assignment for the space industry (Astrium, Boeing)
•Design project including law section

Cooperation ISU / Univ. Paris 11

After SSP or MSS, ISU students can be admitted at the University of Paris 11 for:

- The Master of Space and Telecommunications Law
- A PhD in space law, telecommunications law or media law

Those two programs are fully sponsored by the French government and developed in collaboration with the institutions and the industries from the space, telecoms and media sectors.

Professional Development Programs (PDP)

- Take many forms - short courses, seminars, workshops - as appropriate to the subject and the needs of the participants.

- Tailor-made to respond to the needs of a sponsor.

- Focus on the 3-I space "niche" where ISU has its main strengths.

Annual International Symposium

A different kind of symposium, examining an important topic from all points of view - engineering, business, law, policy, social impact

- 1996: Space of Service to Humanity: Preserving Earth and Improving Life
- 1997: New Space Markets
- 1998: Space and the Global Village: Tele-services for the 21st Century
- 1999: International Space Station: The Next Space Marketplace
- 2000: The Space Transportation Market: Evolution or Revolution?
- 2001: Smaller Satellites: Bigger Market?
- 2002: Beyond the International Space Station : The Future of Human Spaceflight
- Satellite Navigation Systems : Policy, Commercial and Technical interaction

END

Any Question?

Status of Space Law, Policy and Institutions in Argentina

by Dr. Oscar Fernández-Brital ([*])

1. - Introduction

Argentina has collaborated with the UN space law making process since the very beginning and with the works of UN specialized agencies in other technical fields.
Due to the efforts of two pioneers in such matters, Ambassador Dr. Aldo A. Cocca and Ing. Teófilo M. Tabanera. (1) The first in the always remembered Ad-Hoc Committee on the Peaceful Uses of Outer Space (2) the second in UNESCO and COSPAR.
Following such first steps, Argentina was a member of all the drafters groups that produced the UN Space Resolutions and Conventions.
This participation on multilateral rules was continued by bilateral agreements on more detailed matters and the enactment of different national rules in accordance with those norms or for organizational purposes.

2. - United Nations Instruments

Argentina has signed and ratified most of the UN Treaties and as a member of the Ad-Hoc committee (Res. 1348 XIII) and later UNCOPUOS (Res. 1472 XIV), has collaborated in the law making process of the later Resolutions.

Only the 1984 Agreement Governing Activities of States on the Moon and other Celestial Bodies, has not been signed.

3. - The CONAE

The actual Argentine Space Agency, is CONAE, National Commission for Space Activities, created by Decree 995/91.

The same Decree in art. 8, dissolves the previous one - Argentine National Space Research Commission, created by Decree 1165/60, whose first President was Ing. Teófilo M. Tabanera.
The 1991 Decree later had different modifications, enlargements, etc. (D. 1435/91, D. 1436/91, D. 2238/91, D. 2239/91, D. 727/92, D. 765/93, D. 1662/96).

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[*] Member IISL, IAA, Prof. Aeronautical and Space Law, Law School, University Institute, Federal Police; Prof. Aeronautical and Space Law, School of Law, UCES University.
1) Fernández-Brital, O. Sanchez-Peña, M. " Teofilo M. Tabanera (1909-!981) The divulger ",
IAA-00-IAA.2.04, and Acta Astronautica Vol. 50, N. 4, pp. 257-259, 2002.
2) UN Res. 1348 (XIII), 13 December 1958.

The Decree 2076/94, enacting the National Space Program " Argentina in Space 1995-2006 " established that the Program should be conducted by CONAE, and revised very two years. The last revision, D.1330/99, adjusted the Program to the country's actual capabilities and needs.

On paragraph 3.3. " Juridical matters and international relations " the Plan fixed the country's position:

" 3.3.1 International cooperation is a key issue as far as space technology is concerned. Argentina has already a lengthy and active cooperation with Brazil, France, Germany, Italy and the United States and is presently planning joint projects with Denmark, Spain and other countries. CONAE shall encourage these cooperation lines, as far as they converge with the development work scheduled in the National Space Program and involve concrete projects aimed at well-defined goals. Any initiatives or proposals for international cooperation implying diversification of efforts shall be considered by CONAE as of secondary importance."

" 3.3.2. CONAE will place special emphasis on strengthening regional cooperation in space matters. It will look forward to expanding the goals and optimizing the tasks scheduled in the present Program, encouraging active cooperation within the framework of the MERCOSUR. It will promote the use of supplementary infrastructure resources and development means in the region, schedule the performance of mutual assistance actions, contemplate supplementary development work and explore the possibilities for the performance of joint space missions."

" 3.3.3. CONAE shall assist the Ministry of Foreign Affairs, International Trade and Religion on matters related to international agreements on space subjects. In like manner, it shall contribute with the relevant technical elements for research on Global Change, which is presently becoming an international cooperation body jointly with the IGBP (International Geosphere Biosphere Program) and others. These research activities will demand a most significant effort in space actions and are relevant to a national management of natural resources and the biodiversity throughout the region, as well as to foreseeing social and economic changes which influence Argentina and hemisphere."

" 3.3.4. With its own actions and as far as it converges with its objectives, CONAE will support the initiatives of research on the Global Change, which is presently acquiring institutional and international cooperation dimensions, with the IGBP…and others institutions. This research work would demand a highly significant effort in the space field and is of interest for a rational management of renewable natural resources and of the region's biodiversity, as well as for forecasting social and economic changes that may affect the country and the hemisphere"

4. - Register of Objects Launched into outer Space

In compliance with Law 24.158, which adheres to the Convention on Registration of Objects Launched into Outer Space, the Executive Power signed Decree 125/95 that creates within the CONAE the National Registry of Objects Launched into Outer Space.

This norm was completed by Decree 252/96 and Decree 260/99, on organization, procedures and documents for registration.

The normative procedure was completed by Decree 463/97, on Space Operators.

5. – Conclusion

Argentina has shown, since the beginning of the space age, a serious willingness to cooperate with the UN efforts for the development of clear rules for space, and has promulgated the necessary national laws in order to fulfil international regulations.

It is also involved in many international projects on practical matters. In such a way we must remember, as the last example, the control of the International Gamma Astrophysics Laboratory - a joint work of ESA, Russia, Switzerland and the Czech Republic- from CONAE´s base in Mar del Plata (La Nación, 18-10-02, p. 13).

As stated in the " Space Plan ": Argentina may be labelled as a "space country " because of its intensive use of the products from space science and technology. This happens due to its extensive territory - from pole to tropic -, with high meteorological vulnerability; economic activities based on primary exports; a social development level that requires an intensive exchange of data and information; wide population distribution with intensive use of telecommunications; and the regional and international links that will oblige it to generate and use all space developments.

United Nations / International Institute of Air and Space Law

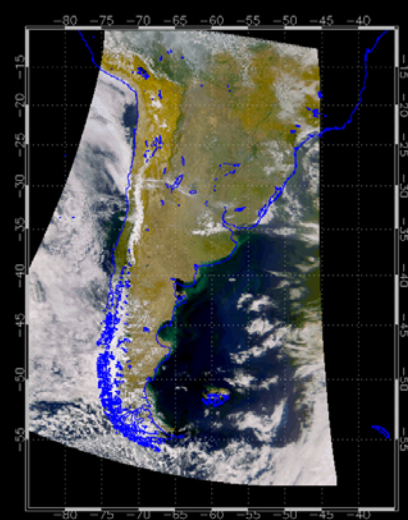
" WORKSHOP ON CAPACITY BUILDING IN SPACE LAW "

The Teaching of Space Law

Dr. Oscar Fernandez Brital

School of law

Universitary Institute of the Argentine Federal Police



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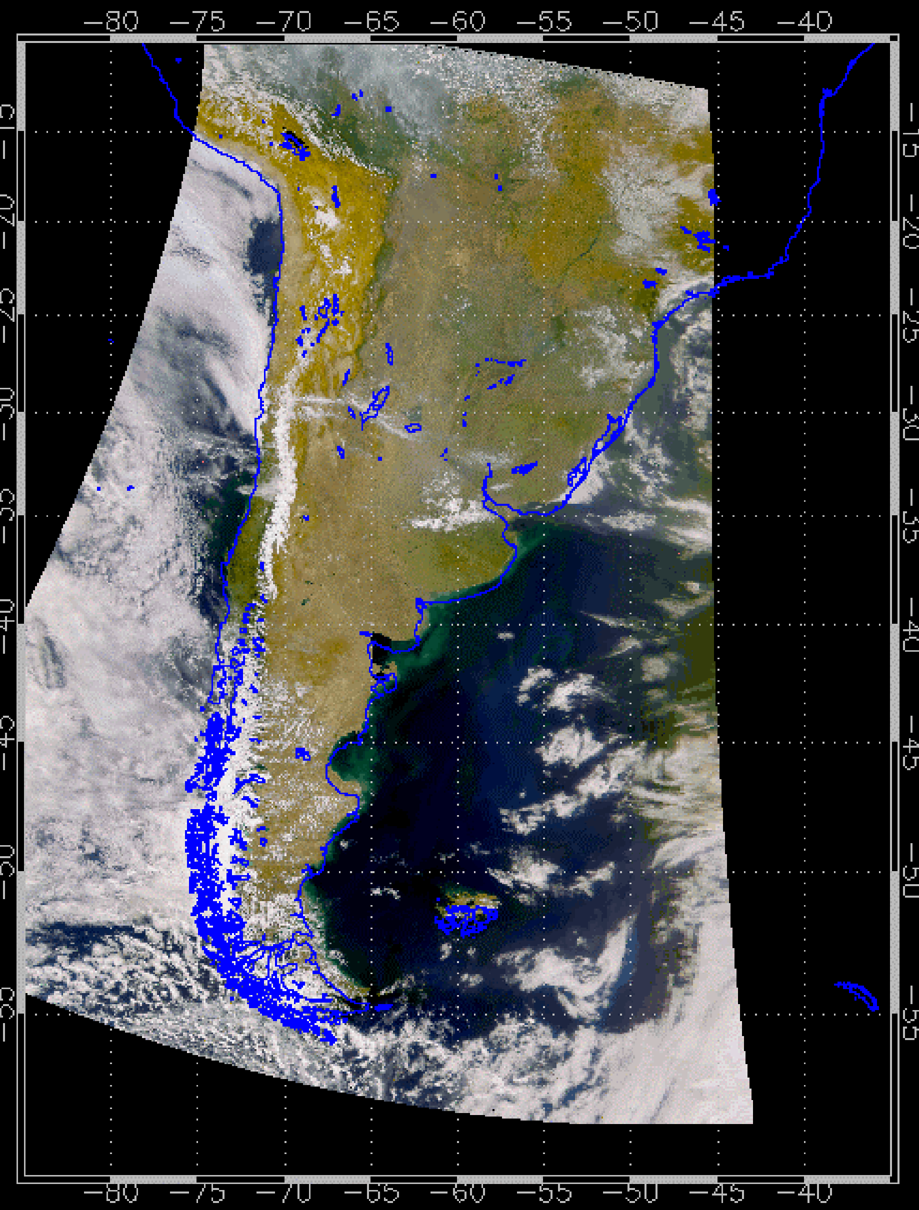
CONAE

18 - 21 November 2002 - The Hague, Netherlands

The Teaching of Space Law

- Argentine Experience
- Some ideas for the future



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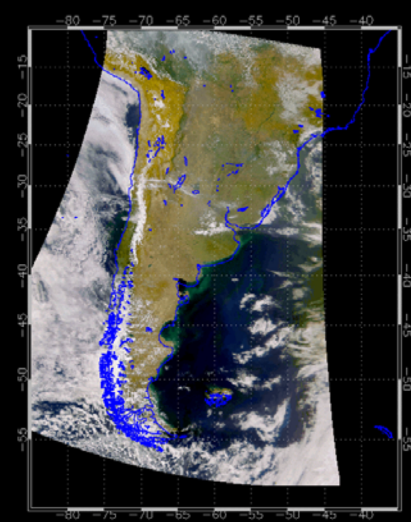
CONAE

Argentine Experience

- Since... *1950*

"Interplanetary Law for the great audience"

Prof. A.A. Cocca



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CONAE

Argentine Experience

1950:

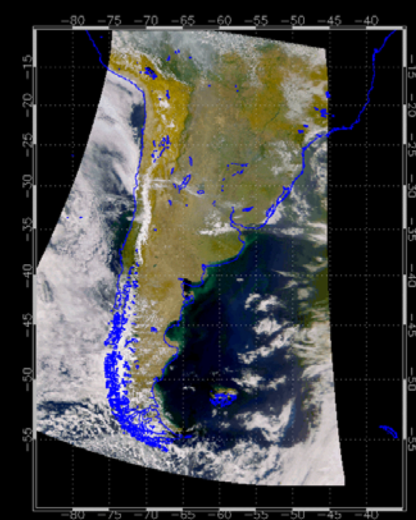
I.N.D.A.E.

1 University

Today:

I.N.D.A.E.

15 Universities



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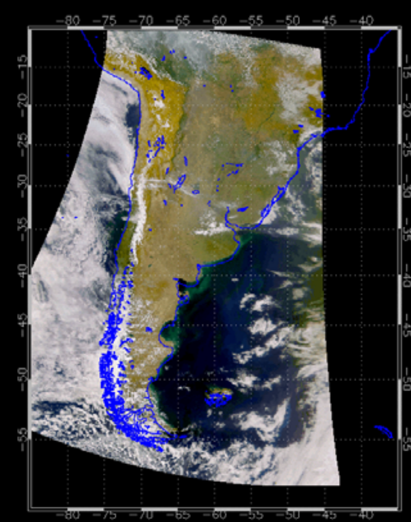
CONAE

Argentine Experience

- Today:

Number of students per year:

- I.N.D.A.E.: **25**
- Universities: **630**



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CONAE

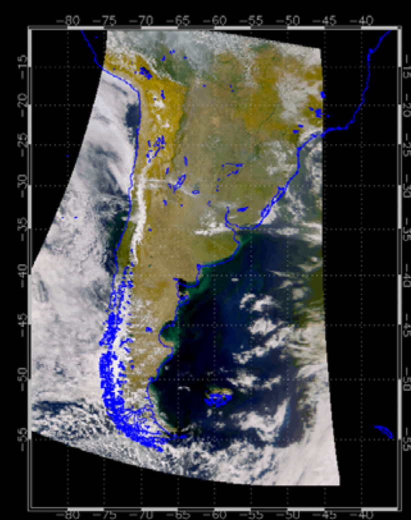
Argentine Experience

- Today:

Name of the Chairs:

- I.N.D.A.E.: Space Law

- Universities:
  - Maritime, Aeronautical and Space Law
  - International and Space Law
  - Transport and Space Law



SeaWiFS True Colour Browse Product
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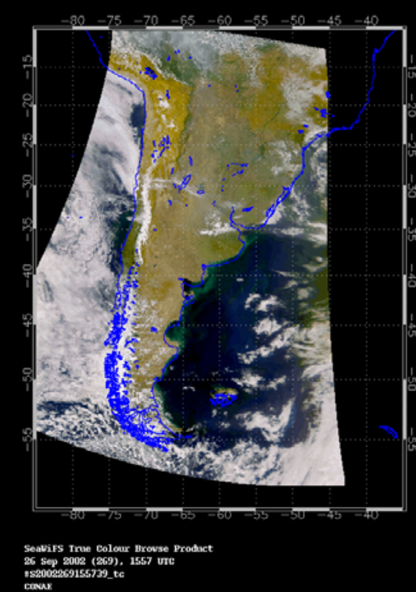
CONAE

Argentine Experience

- Today:

Number of Hours per year

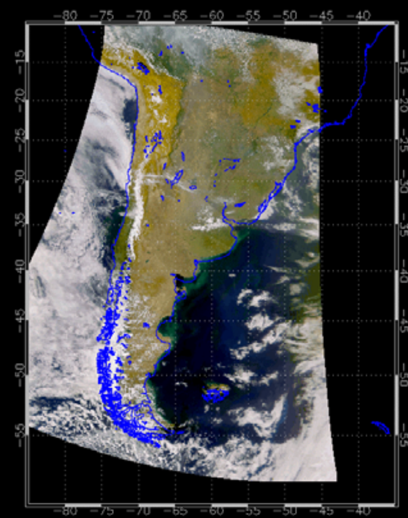
- I.N.D.A.E.: 40
- Universities: 30



Argentine Experience

Principal Programme Items:

- Outer Space and Celestial Bodies
- Space vehicles and satellites
- Astronauts
- Contracts
- Liability
- Insurance
- Communications
- U.N. and space activities



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CONAE

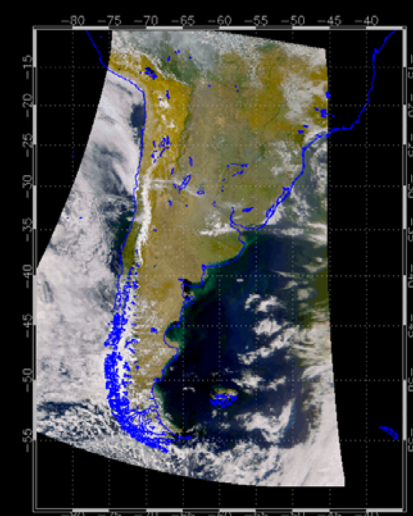
Some Ideas for the Future

Actual panorama:

- Many courses on specific points
- Lack of general space law courses

Future:

- Draft of a short programme
- Draft of a complete programme



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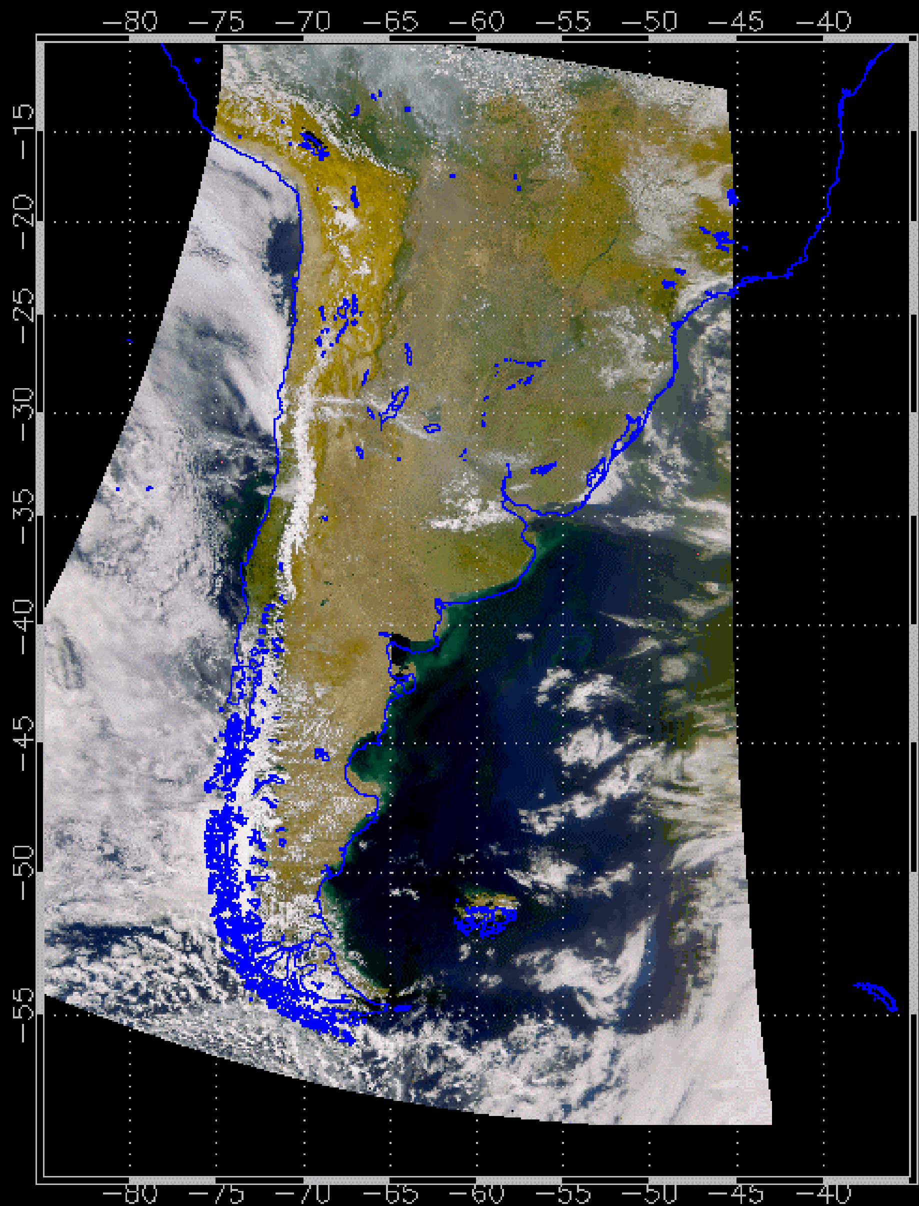
Dr. Oscar Fernandez Brital

School of law

Universitary Institute of the Argentine Federal Police

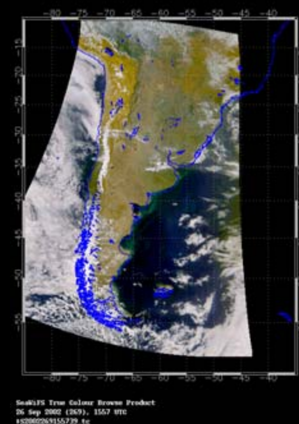


" WORKSHOP ON CAPACITY BUILDING IN SPACE LAW "

18 - 21 November 2002 - The Hague, Netherlands

Contact...

fernandezbrital@movicombs.com.ar

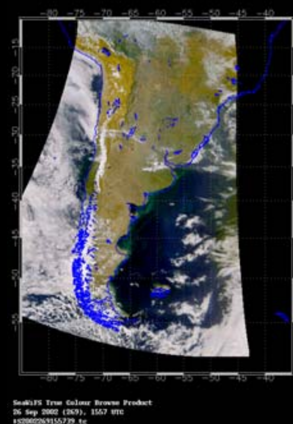


Satellite photograph from Argentina:

C.O.N.A.E

Music:

Astor Piazzolla & Gerry Mulligan - Años de Soledad



Zimbabwe

Ms. D. Maphimdhize
Zimbabwe Attorney General's Office

Zimbabwe is a developing state situated in the southern part of the continent of Africa. Its economy is largely agri-based but it is also enjoying some vibrancy in the fields of commerce like telecommunication and broadcasting due to the removal of government monopoly. It has several universities with one concentrating on science and technology, several technical institutions and one advanced scientific research institute, as well as a recently introduced Ministry of Science and Technology which is meant to implement the National Science and Technology Policy launched by the government around August 2002.

My country is not involved in any space activities. Knowledge about outer space activities and its applications is largely an interest of a few, e.g. scientists, meteorologists, agricultural specialists, telecommunication and broadcasting services, environmentalists and university specialist departments, etc., but the majority of our people are ignorant of such activities and in instances when they aware, they are largely unconcerned as they do not know how those activities affect them and how they benefit from them. There is broadly speaking no education on space activities, hence there is no interest in UN treaties on outer space activities. This affects policy makers as well because very often there is no link between certain commercial activities benefiting the country and the UN treaties on outer space, unless one has been sensitized. As a country, we benefit from space activities through certain applications in areas of telecommunication, broadcasting, meteorology, agriculture, urban and town planning and research, etc. We do not have a receiving station for satellite images but we place orders with South Africa, Brazil, USA, etc. This is very expensive on our part and is a drawback on research and technological advancement.

After having given this background, I wish to address in brief the specific information requested as follows:

1. Most effective steps to influence my country to become a party to UN treaties on outer space.

There is a need to identify the key institutions that are likely to play a meaningful role in influencing the country to become a party. The key institutions that I believe can shape policies, laws and scientific activities are the Attorney-General's Office, Ministry of Justice Legal and Parliamentary Affairs, Law Development Commission, Ministry of Higher Education (Universities and technical colleges) and Scientific and Industrial Research and Development Centre which is under the Office of the President and Cabinet and the Ministry of Science and Technology.

There is a need to educate the legal officers, policy makers and scientists in the identified institutions on the outer space activities and treaties governing such activities, their contents, their benefits including the pros and cons of being a party or not being a party to any or all of the treaties in view of our non-participation in space activities. Education could be through training workshops locally and regionally as well as dissemination of information on space activities and the benefits derived to the broad spectrum of the society. When interest has been generated, this will definitely stir debate and a weighing up of pros and cons of joining or not joining. As the removal of the government monopoly on certain sectors of telecoms and broadcasting has led to rapid development and competition in those areas, I am certain the government would on its own or through a dialogue with stakeholders, lean more towards acceptance of the treaties and agree to be a signatory.

There is a need to know and to have information about other development countries' involvement in outer space activities, the methods they have employed to be involved, what the countries benefit from such activities and most importantly the extent of involvement of indigenous scientists in such activities so as to break the myth that this is an area for scientists from the developed world only.

2. Technical assistance needs

There is a need for experts in key institutions, referred to above, to provide advisory services and train officers in space activities, law and policy. There is a need for financial assistance in order to get the necessary equipment for use in receiving satellite images so as to promote research and acceptance of the importance of space activities through visible beneficial applications.

There is also a need for funding to initiate projects on space activities by promoting space science in the education curriculum alternatively through broadcasting programmes to benefit children, pupils and students so as to build and nurture interest and development of space sciences and applications and space law and policy.

3. Most suitable strategy on availing education

Training workshops, introducing postgraduate courses/fellowship programmes for study of space law, policies and applications in order to encourage involvement of peoples from developing countries and to introduce space sciences and applications in the education curriculum right from primary school to university.

Conclusion

You will note that although I have been practising law for the past 12 years, this has been my first opportunity and excuse to research on outer space law and policies, as well as to make an effort to identify key institutions benefiting from space applications. Our scientists have advised that they have been hitting a brick wall in trying to push for change in policies on outer space law and applications, due to a lack of information and sensitisation of the policy makers and the lawyers. They also advised it would help if information about third world (developing countries) activities on outer space are disseminated along with information on Zimbabweans involved in such activities in foreign space centres so as to create role models and develop/generate an interest to develop and promote cooperation and research in outer space activities by developing countries.

Application of Space Science and Technology in the Americas and its Benefits for Civil Society

By Ciro Arévalo Yepes
Deputy Chief of Mission
Embassy and Permanent Mission of Colombia in Vienna, Austria

It is a matter of great pleasure and honour for me to be here at the Workshop on "Capacity building in Space Law". I congratulate the organisers of the workshop, and express my deep appreciation and gratitude to the Dutch Government, The International Institute of Air and Space Law , particularly Dr von der Dunk and the United Nations Office for Outer Space Affairs for sponsoring my participation in this meeting and for inviting me to present a paper in this city, The Hague, considered the "haut lieu" of international law.

The topic of my presentation is, "Application of Space Science and Technology in the Americas and its benefits for Civil Society," which represents the results of the IV Space Conference of the Americas, held in Cartagena, Colombia, in May this year (2002), which was co-sponsored by the United Nations, the European Space Agency, and the Colombian Government. For the next three years, Colombia assumes the Secretariat Pro-Tempore of the Conference and in order to implement its mandate, the countries of the region are recommended to call on international support to identify areas of co-operation and follow up.

At the outset of this presentation, I would like to underline the importance that developing countries, and particularly the Latin-American region, attach to international co-operation in space affairs. I understand that the concept of a developing country is a notion of nuances. It depends on the different levels of industrial and economic development, the internal or external perception of their geopolitical weight and a number of external forces that may not always be perceptible.

Irrespective of their differences, many developing countries, as the Latin American group demonstrated in the IV Space Conference of the Americas, have shared in enforcing or creating new co-operation structures that permit them to obtain an equitable share of resources linked to outer space. They conceive this as a useful instrument to achieve their goals in terms of their economic and technological developments. This is why it is so important to gather at the regional level in order to evaluate and ponder expectations and potentials, and to demonstrate how and why it is important to be a part of the legal space framework. In this regard, the General Assembly of the United Nations, in its Resolution No.A/RES/55/122:

"Recognises the usefulness and significance of the space conferences of the Americas for the Latin American countries, encourages the convening of a Fourth Space Conference of the Americas, and also encourages other regions to convene periodically regional conferences with a view to achieving convergence of positions on issues of common concern in the field of the peaceful uses of outer space among States Members of the United Nations"[1]

I. TOWARDS A NEW MODEL OF CO-OPERATION IN SPACE APPLICATIONS: FACING THE PARADOX

The activities in space represent a privileged environment of great potential for the future, given the possibilities that its civil applications provide economic and social development; but, paradoxically, it is also a place where the greatest technical-scientific disparities between developed and developing States are reflected and where their asymmetric differences take force, accentuating what we commonly know as the "gap" in development.

[1] United Nations Resolution A/RES/55/122

The reasons and the diagnostic are well known. While there is increasing recognition in most Latin-American countries of the need to use space technologies in support of sustainable development and on developmental activities, there are two interesting and interrelated issues to be addressed : first, promoting technology itself and the associated problems encountered, particularly the legal and financial *aspects*, and secondly , *effective utilisation* of the high technology knowledge, once acquired, for sustainable development activities.

This is even more evident in times of economic crises because the most urgent priorities *restrict* the explorations of the potential benefits that space technology can offer, but also reduces the possibilities to demonstrate to the key decision makers the application that such technologies can contribute to improve their economic and social conditions. *And this is the true challenge.*

The conception and elaboration of the Agenda of the IV Space Conference of the Americas was a true reflection of the situation through which *space activity is tangential to practically all the social and economic activities.* In the case of the Latin America region, it is evident how geo-spatial data for example can help to improve a sustainable management of their great natural resources and mitigate the harmful effects and economic and social consequences of natural disasters. *The possibilities become endless.*

The great challenge facing all these benefits lead us to reflect upon how to have access to said technologies and what mechanisms we should promote and conceive in order to reach these objectives, such as mechanisms of north-south co-operation and also south-south co-operation, and articulations and alliances with different sectors, with Space Agencies (i.e. ESA), institutions of space law, the private sector and the academia.

II. DEVELOPMENT OF SPACE ACTIVITIES, ESPECIALLY AFTER UNISPACE III

Within this framework of the multilateral structure, essentially reflected in the United Nations and particularly in COPUOS, emerges a powerful tool in favour of the achievement of the clear objective for the promotion of space activities, in the technical as much as in the legal aspects. Its most influential expression was consecrated in UNISPACE III, which proved to be a fundamental transformation in the global perception of space activities.

UNISPACE III created tools and established new links in a way that liberated and promoted new articulations and strategic alliances, and its respective instances of agreement and in a certain way, established a level of obligations for co-operation between the States. This structure is without precedents in the history of technological relations and, as known, between developed and developing countries. It produced what is known as a change of paradigms in the global technological environment. But to express the change of paradigm is not enough, and no necessary means have changed the technological capacities of the developing countries. Then, the real task in front of us is how to implement these recommendations.

Many countries of the Latin-American region have initiated their own space technology and applications programmes. We have been privileged by sharing institutional experiences from Brazil, Argentina , Chile and Colombia -- their difficulties, their challenges, and their future expectations.

The essential impetus for embarking on such programmes is the need to support the nation's developmental needs and to deal with the problems of education, pollution, health, telecommunications, environmental management, utilisation of natural resources, weather and climate applications, security, urban and rural infrastructure, land-use management and many other local-level resource problems. Technology development is a major issue that is being addressed, specifically by means of small satellites and their launches.

An institutional framework within individual countries would help in developing national space programmes. The framework could address policy and programme issues, as well as the implementation of the programme. The framework could also address the key research and development issues and operational development plans and lay stress on the involvement of industry. It appears relevant to conceive of co-operation projects addressing the main difficulties in building legal structures on a national level.

There is a need to look at innovative solutions to meet space technology and applications in support of the countries of the region. One such proposal put forward is the possibility of a series of small equatorial-orbit satellites to meet imagery requirements, which represents the most useful tool, but at the same time the most costly ones for the developing countries.

"Natural disasters are a matter of great concern to Latin-American countries. The next decade (2000-2010) should be devoted to develop an integrated strategy for the use of space technology in the assessment, prevention, mitigation and reduction of natural disasters. A better understanding of climate phenomena with global implications such as "El Niño" could contribute to the timely reaction to natural disasters, through the adoption of effective preventive measures.

In addition, the gigantic spread of scientific and associated industrial areas arising out of space technology development, offer some special benefits to developing and developed countries alike in the sense of both commercial activities and the need to develop national systems. No longer is the space sector considered a remote and technical area of interest only to scientists and for space exploration alone. It is a vast and ever expanding new horizon".[2]

III. EVOLUTION OF THE SPACE MATTERS IN THE LATIN-AMERICAN REGION

In general terms, despite their level of space technology, Latin-American countries played an influential role in the formulation of international space law in all the fora concerned. The Legal Subcommittee of COPUOS and ITU's World Radiotelecommunication Conferences. Their participation on the formation of concepts of exploration and use of outer space as reflected in art. I of the Space Treaty of 1967 .. "that shall be carried out for the benefit and interest of all countries, irrespective of their degree of economic or scientific development," are well recognised. It was also the case in the formation of other key concepts as in the "common heritage of mankind", which was later converted into a legal principle of universal acceptance.

The consensus adopted by the UN General Assembly concerning the Principles Relating to Remote Sensing of the Earth from Outer Space was the result of a compromise in which the participation of Latin-American countries was instrumental. Decisive participation of the countries of the region, particularly of Colombia in the adoption of an agreement that was approved by unanimity by the General Assembly to establish a mechanism of equitable access to the geostationary orbit, represented a substantial step forward toward the preservation of interests of developing countries.

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[2] From the Statement of the Group of 77 and China for UNISPACE III

As far as the IV CEA is concerned, the basic rationale of convening a hemispheric conference is to keep on improving the models of international hemispheric and trans-hemispheric co-operation that take into account the interests and the needs of the developing countries. Those are immense as well as concrete goals and represent a challenge for a region where the first power of the globe and countries with diverse levels of development coincide.

The agenda took on two main chapters: politics of space and the inter-institutional experience of the more advance space institutions in the region and outside the region . Nearly two hundred experts from the national authorities , academia and the private sector attended the Conference. Among them were high ranking official representatives and decision makers from the region; the main Space Agencies: Space Agency of Argentina (CONAE) , Instituto Nacional de Pesquisas Espaciales (INPE) from Brazil and the Brazilian Space Agency (AEB), The Chilean Space Agency, NOAA and the State Department, Space and Advanced Technology Division, The Peruvian Space Agency, Canadian Space Agency and others. Countries outside the region were very active, particularly France and Spain. The private sector was present and an agreement was signed by ANDEAN countries over the Andean Satellite ANDESAT and the operator Start One. The BID, as well as other financial institutions, were present.

Former Space Conferences of the Americas were held in Costa Rica (San José, 12 to 16 March, 1990), which was a first step towards the creation and establishment of different mechanisms of cooperation; Santiago, Chile, 26-30 April, 1993, Second Space Conference, where the main objective was the creation of national programs designed to strengthen the ties of co-operation; and a third conference was held in Punta del Este, Uruguay (1996).

A preparatory meeting for the IV CEA was held in Santiago de Chile with the strong support of the Chilean government and space institutions.

IV. MAIN RECOMMENDATIONS OF THE IV SPACE CONFERENCE OF THE AMERICAS, IV CEA

1. Emphasise the relevance of the Conference as a forum suitable to reassert the commitment of the countries of the region to make progress in space activities, the application and peaceful use of technologies derived from them and the promotion of co-operation as an essential mechanism to achieve these objectives in a more equitable manner.

2. Recognise the contributions made by the Third United Nations Conference on the Exploration and Peaceful Uses of Outer Space – UNISPACE III, especially those related to the application of space science and technology to achieve sustainable development, particularly in the countries of the region.

3. Emphasise the importance of the Space Conferences of the Americas held in 1990, 1993, and 1996 which have permitted greater scientific and technical understanding of space matters and *promoted the advisability of better co-ordination among the countries of the region in the interests of space-related scientific and technological integration*, which takes account of existing differences and makes it possible to satisfy basic needs in order to achieve sustainable development.

4. Accept the recommendation of UNISPACE III, *emphasise the urgent need to promote education in space science and technology* as a basic instrument for obtaining their potential benefits, and urge the countries of the region to redouble the efforts in this field and to consider education in space science and technology as the basis of viability in the implementation of related projects and initiatives.

5. Confirm the commitment made in earlier conferences and in Resolution 55/122 of 13 December 1996 of the General Assembly of the United Nations, in which the States reasserted the use and exploration of outer space for peaceful purposes, taking account of the needs of developing countries. *In this, the countries undertook the responsibility to formulate and implement policies, programs and projects for international co-operation designed to strengthen sector development plan*s, whose implementation strategy requires the application of scientific knowledge and technology for the peaceful use of outer space.

6. Recommend the *search for fresh sources of funding* in the multilateral regional and inter-regional agencies and the private sector for the implementation of development activities in order to make the commitments of IV CEA viable.

7. Note with satisfaction the progress being made by Brazil and Mexico, with encouragement from the United Nations Office for Outer Space Affairs (OOSA), for the *establishment of the Regional Space Science and Technology Education Centre for Latin America and the Caribbean, and urge countries to join in this process*.

8. Urge countries to comply with the recommendations of UNISPACE III and Resolution 545/67 of the General Assembly of the United Nations: "International Co-operation for the Peaceful Use of Outer Space" and Resolution 51/122 of the General Assembly of the Untied Nations: "Declarations on International Co-operation in the Exploration and Use of Outer Space for the Benefit of All States, taking into particular account the need of Developing Countries", and encourage them to comply with Resolution 54/68 of the General Assembly of the Untied Nations titled " The Space Millennium: Vienna Declaration on Space and Human Development", to promote the participation of men, women and youth all over the world in joint activities relating to space.

9. Encourage the countries of the region to continue *to identify and implement projects designed to use space technologies,* emphasising the importance of offering equitable and opportune access to information in fields such as risk management, prevention and mitigation of natural and man-made disasters, tele-education, telemedicine and medical services, and protection of the environment, amongst others.

10. Urge the countries of the region, government agencies and the private sector of the Americas and elsewhere to strengthen co-operation and co-ordination to improve the management of *networks for prevention of and attention to disasters, by means of satellite applications* that lead, amongst other things, to the maintenance of a humanitarian network in the region using images produced before and after natural disasters, thus facilitating prompt evaluation for countries of damages and of actions taken to attend the victims.

11. Reiterate the importance of international co-operation as a mechanism to strengthen peace, *security and the promotion of human development through the peaceful use of outer space*. They trust that a contribution will thus be made to improving the quality of life of citizens of the signatory countries of the Vienna Declaration on "Space and Human Development".

12. Urge the countries to adopt active policies to promote greater diffusion and dissemination of the topics on the space agenda to create collective consciousness of the importance of using space technologies in order to achieve sustainable development.

13. Conscious of the progress made in space activities by government entities, space agencies, scientific and academic groups and the private sector in the region, I urge those taking part in the Fourth Space Conference of the Americas, IV CEA, to increase their support for strengthening national-level institutions that implement projects and programs derived from space science and technology, in order to secure appropriate follow-up for the commitments made at this Conference.

14. Adopt the Action Plan, an integral part of this Declaration.

15. Instruct the Secretariat Pro-Tempore to promote the application of the Action Plan and urge countries in the region and elsewhere, agencies and organisations involved in space activities, as well as non-governmental organisations and private industry to support the work assigned to the Secretariat.

16. Agree on the importance of creating effective mechanisms of co-operation and co-ordination in the region and instruct the Secretariat Pro-Tempore to take the necessary steps on this point indicated in the Action Plan. Note with satisfaction and acknowledge the Chilean delegation's presentation titled "Creation of a regional Consultation Mechanism for Space Matters".

17. International Space Legal Frame Work

    (a) States from the American region are invited to ratify the different sets of conventions and treaties on international space law.

    (b) Submitted to COPUOS Legal Subcommittee's consideration is the draft of a unified Space Convention, reflecting both the existing principles in international space law, and the new realities in the exploration and use of outer space.

    (c) States are invited to instruct and advice their representatives, before the COPUOS and the ITU to enhance task coordination in relation to these bodies.

    (d) Submitted to the Pro Tempore Space Conference of The Americas, IV CEA, is the Secretariat's consideration to produce a registration system of the existing national legislation on activities and use of outer space, in the countries forming part of the aforementioned region.

    (e) The creation of a Regional Center for the education in the areas of space science and techniques, incorporating the different studies on space legislation and other space matters is recommended. It would serve the purpose of unifying the position of the Region's States by way of developing investigation and analysis activities in the referred areas of space and science techniques.

18. Multilateral Mechanisms and the Needs in the Region: Strategic Alliances and Regional Agreement

As a prerequisite to the establishment of a regional position with the purpose of developing a cooperation strategy, it is recommended that the different countries forming part of the region, constitute national (State) bodies responsible for space related matters.

Criteria and Methodology for Project Submitting
Institutional experiences technology for the general population

19. The Advantages in the Application of Space

- Telecommunications, tele-education and telemedicine
- Scientific investigations and education in the area of space science
- Environment and climatic change
- Future vision and management of natural resources
- Satellite navigation systems

V. ACTION PLAN

Instruct the Pro Tempore Secretariat:

1. To promote co-operation and co-ordination in programs or projects related to space topics through mechanisms considered appropriate and where circumstances so merit, in the following areas:

    (a) Environmental protection and support for sustainable growth;

    (b) Prevention, early warning, rescue and mitigation operations in the face of natural and man-made disasters;

    (c) Education, research and development space science, technology and applications; and

    (d) Space law- the creation of an independent educational institution for teaching and research in space law was considered in order to advise the Latin-American countries with respect to major space law issues at the international level, and for helping them in the drafting of national space law and regulations.

2. To adopt relevant measures to implement the recommendations of IV CEA and to follow them up;

3. To secure the active participation of universities and scientific, technical and legal associations in the Region and elsewhere, the space agencies and the UN specialised agencies in international co-operation projects;

4. To promote the dissemination of space topics in order to create collective awareness of their importance;

5. To arrange, with the Governments of Conference Member-countries, working meetings with institutions and entities involved in space affairs, in order to identify areas of co-operation and follow-up;

6. In order to implement Paragraph 16 of the Declaration of Cartagena the Pro-Tempore Secretariat should act as appropriate to:
    (a) Analyse common requirements on the basis of a survey sent to all countries in the region which will be designed to detect priorities and areas of interest and existing human resources and research centres, projects in progress, focal points etc;

    (b) Request the participation and support of the United Nations Committee on the Peaceful Uses of Outer Space – COPUOS – and the Office for Outer Space Affairs – OOSA – and any other organisations, as necessary, in all phases of implementation of this process;

(c) Identify sources of funding from multilateral co-operation; and

(d) Form a working group composed of representatives of countries of the region, appointed by their Governments to contribute to the identification of action guidelines for Regional co-ordination and acting in close collaboration with the Pro Tempore Secretariat.[3]

[3] Action Plan of the IV Space Conference of the Americas

Capacity Building in Space Law in Morocco

M.S. Riffi Temsamani
Royal Centre for Remote Sensing

- Space activities in Morocco

- The Royal Center for Remote Sensing as a national institution to coordinate space application activities

- Space law activities in Morocco

Overview of Space Activities in Morocco

I) Being aware of the economic and social benefits of the use of space technology, Morocco has set up a dynamic, realistic and sustainable policy for the integration of such technology in the national development projects. Thanks to a political will that has been expressed at a high level of authority, Morocco has provided itself with the appropriate human and material resources and has put together a national network of competencies and users, particularly in the domains of telecommunications, Earth observation and space meteorology.

The launch, in December 2001, of a micro-satellite confirms the will of Morocco to develop national capacities for an efficient use of space for sustainable development.

II) Since the 1970s, Morocco started to integrate space technology in its development programs. In the field of space telecommunications, Morocco uses several regional satellite programs and has signed several agreements with international organizations in order to strengthen its capabilities in terms of communication, data transfer and information exchange. In order to direct decisions in several sectors and for an optimal management of resources, several projects integrating remote sensing have been carried out by a large number of national institutions.

III) The creation of the Royal Centre for Remote Sensing (CRTS) in 1989 has contributed to the development of operational applications and integrated projects through the efforts of all national partners, the setting up of infrastructures adapted to the needs and the creation of a network of cooperation and exchange with foreign partners.

IV) The role of the CRTS is to respond to the priority needs of the country, for supporting strategic decisions, in terms of the management of natural resources, protection of the environment, and land development.

V) The CRTS also provides expertise to national and regional institutions, particularly in the realization and methodologies definition projects, and consultancy and technical assistance.

VI) Within the framework of its international policy, Morocco works actively towards the intensification of its international cooperation in the fields of Space Sciences and Technologies. Morocco undertakes different actions to widen its networks and strengthen its North/South and South/South bilateral and multilateral cooperation.

On the regional level, Morocco participates actively in the elaboration and realization of regional projects, particularly in the Euro-Mediterranean, Africa and the Middle-East regions. Morocco has also organized several activities in collaboration with regional and international organizations (FAO, EURISY, ESA, and COI).

All the actions undertaken by Morocco, as well as its dynamic participation in several other regional and international committees and associations that are active in the field of space (SAF, EURISY, IAF, ISU, ALESCO), show the importance that Morocco gives to cooperation for the development of the peaceful uses of space for the benefit of all nations.

VII) Morocco also gives particular importance to the execution of the United-Nations' program for the application of Space technology. In fact, Morocco is a member of the United Nations Committee on the Peaceful Uses of Outer Space (COPUOS) since 1961. It actively takes part in the proceedings of the Committee and its sub-committee organs since 1992. Morocco was also the Vice-President Rapporteur of the Committee since June 1997, and is first Vice-President since 2000.

VIII) Concerning the Moroccan space law strategy, The Kingdom of Morocco has ratified four of the five treaties concerning the use of space:

- the Outer Space Treaty
- the Rescue Agreement
- the Liability Convention
- the Moon Agreement

The agreement of 1975 on registration is under study by the government authorities and specialized institutions.

Moroccan actions to promote space law are based around:

- Awareness
- Education
- Technical needs

IX) Concerning the awareness, Morocco continues its policy of sensitization, promotion and extension of the use of space to other domains (space technologies, space sciences and space law) by reinforcing training and cooperation programs. In fact, conferences, exhibits and information events are organized on a regular basis to sensitize decision makers, officials, scientists and the youth to the contribution and potentials of remote sensing, space sciences and technologies. Within this context, a national committee of remote sensing has been created to coordinate the activities of different government departments. This committee publishes a scientific review, "Geo Observateur", which reports the results of works and research, undertaken in developing countries, using satellite data and geographic information systems.

X) To ensure the education of space law, it was proposed to integrate this domain in the University and regional center curricula. On the other hand, the important role of the OOSA could be strengthened through the action of experts from specialized institutions (such as IISL, ECSL) to assist with the organization of workshops and seminars.

XI) The needs for technical assistance to develop laws, policies and institutions governing the space activities of greatest importance to our country are:

- Experts to assist concerned authorities to set up the basis of a national space law-framework,
- Exchange with countries that have established national space law,
- Training dedicated to law experts and decision-makers to enhance their understanding and knowledge of space law.

XII-XIII) Atelier de fevrier

The important action realised in this domain, involves the organization of the first workshop on space law by CRTS in collaboration with the European agency. Participants from several African countries are attending this workshop. It’s an opportunity to all participants to debate on ways to enhance the information actions concerning space law and policies.

Morocco goes slowly but surely.

Thank you for your attention.

Capacities building in space law

Case of Morocco

- The space activities in Morocco
- The Royal Center for Remote Sensing as a national institution to coordinate space applications activities
- Space law activities in Morocco

The Strategy

- **The development and use of space applications in fundamental sectors :**
  - In an operational and routine basis
  - Where the economic and social benefits are highly demonstrated
  - Taking into account the priority needs
  - Several fields : Telecom., RS, Meteorology, Navigation
- **R & D**
  - Pilot or demonstration projects, research within universities
- **Awareness and Training**
  - Decision Makers
  - Technical and specialised entities
  - High schools and universities
  - Kids…
- **Regional and International cooperation and activities**
  - Networks with involved bodies and organisations
  - Regional initiatives and Seminars

The Royal Center for Remote Sensing

- **Is a national institution responsible for :**
  - **Development of capacities at the national level**
  - **Coordination and execution of the national program of RS**
  - **Provision of technical advisory services and of Space information**
  - **provision of training and education opportunities in Space technologies and carrying out research actions and programs**

Operational applications to support strategic decisions

- **Support to government departments in various fields :**
  - Agricultural statistics and production forecasting
  - water resources management
  - forest and pastoral resources assessment
  - urban and land management
  - space cartography and geomatics
  - environment and hazards
  - geological applications
  - oceanography, climate and marine resources

Services to support users

- **The CRTS provides expertise to national and regional institutions (governmental, private, …) for :**
  - project realization and methodologies definition
  - acquisition, archiving and distribution of Earth observation data
  - consultancy and technical assistance
  - providing training and education opportunities in space technologies
  - carrying out research actions and programmes

International actions to promote cooperation

- **Technology transfer and cooperation development :**
  - Contribution to regional and international programs: COPINE, AFRICOVER, RAMSES, CAMELEO...
  - membership in international associations and committees COPUOS, IAF, SAF, COSPAR, EURISY,...
  - organization of international conferences dedicated to the region, Marisy (92, 95, 2000), Eurisy (97, 2002), Workshop on space law, Regional preparatory UNISPACE III conference for Africa and Middle-East (1998)
  - works with UN organizations : FAO, UNDP, UNEP, OOSA, UNESCO,...

A particular importance to the COPUOS

- Morocco is member since 1961
- Actively takes part in the proceedings of the committee and its subsidiary bodies since 1992
- Vice-President Rapporteur of the committee since 1997
- Vice president since 2000
- Morocco Ratified 4/5 treaties concerning the use of space
- Morocco hosts the UN regional Center for education in Space Sciences and Technologies for Africa (Fr. Speak.)

The Moroccan space law strategy

- United Nations Treaties

  Morocco has ratified 4 of the five UN treaties :

  - the outer space treaty
  - the rescue agreement
  - the liability convention
  - the Moon agreement

The registration convention will be ratified in the coming months

- Program
  - Awareness
  - Education
  - The Technical needs

The awareness

Morocco continues its policy of sensitization, promotion and extension of the use of space to other domains (space technologies, space sciences, space law…) by :

- strengthening training and cooperation programs
- Conferences, exhibits and information events are organized on a regular basis to sensitize decision makers, officials, scientists and the youth to the contribution and potentials of remote sensing and space sciences and technologies
- within this context, a national committee of remote sensing has been created to coordinate the activities of different government departments.
- publication of a Newsletter and a scientific review

« Geo-Observateur », which reports the results of works and research, undertaken in developing countries.

The education

- ✓ Initiatives to integrate space law in the university and regional centers curricula
- ✓ OOSA could help specialised institutions in developing countries to set up programs for a wide explanation of the dynamics and uses of all the treaties that regulate outer space

The technical needs

- ✓ UN or Agencies experts could play an important role to assist concerned authorities to set up the basis of a national space law-framework
- ✓ exchange with countries that had established space law and policies
- ✓ training dedicated to specialists in law to enhace their understanding and knowledge the space law

Action to promote space law in Morocco

- Organization of the first regional workshop on space law dedicated to French speaking African countries

  - Organization and aim

✓ Avenue 14-15 February 2002, Royal Center for Remote sensing, Rabat, Morocco

✓ Co-organized with European partners, ESA-ESCL, CNES ASI, DLR, etc..

✓ the aim was to promote space law in developing countries especially in French speaking African countries

- The themes of the workshop

- ✓ The United Nations treaties and their applications
- ✓ the national space laws
- ✓ the legal aspect of remote sensing
- ✓ the launching state concept

- Recommendations

- ✓ to increase public awareness, information actions should be organized frequently
- ✓ a large spreading of the COPUOS and its sub-committees work and actions

Slovakia

M. Kollar
Slovak Embassy in The Netherlands

Mr. Chairman, ladies and gentleman:

It's a great honour for me to represent my country at this important gathering. Let me give you some brief general information on activities in the field of Space research and Space law in Slovakia.

The Government of the Slovak Republic, by its decision in November 1999, created the Commission on Research and Peaceful Uses of (Outer) Space. (The present chairman of this Commission is Dr. Richard Kvetnansky, PhD., Director of the Institute of Experimental Endocrinology, Slovak Academy of Sciences.)

The Commission fulfils a role similar to that of Space Agencies in other countries. The aims of the activities of the Commission are:

- to co-ordinate all research and industrial activities in the Slovak Republic related to space,
- to prepare proposals for government policy with regard to space research and the use of obtained results for the development of the national economy,
- to initiate and increase the research and industrial institutions contacts with abroad, related to space activities,
- to support the participation of the Slovak Republic in the activities of international intergovernmental organisations involved in research and peaceful use of space,
- to prepare reports on space activities in the Slovak Republic for COPUOS and other international organisations involved in space activities
- to collect scientific and technological information on space research and the peaceful uses of outer space and to transfer this knowledge to the education process and to the industry,
- to propose the financial support (grants) for the projects on research in space and on the peaceful use of space,
- to organise scientific symposia, conferences and workshops on the problems of space research and on peaceful use of space, to support the participation of Slovak specialists on similar conferences abroad,
- to create and negotiate the conditions for cooperation or membership of the Slovak Republic in the European Space Agency, Committee on the Peaceful Uses of Outer Space (COPUOS) and other organisations involved in space activities.

There are six Boards of Specialists working in the frame of the Commission, representing the main fields of space activities in the Slovak Republic:

- Space meteorology
- Remote sensing
- Space physics
- Space biology and medicine
- Satellite technique, telecommunication, space technology and material research
- Space law

On September 13, 2000, the Government approved the Report on the use of the results and new information from the space flight of the first Slovak astronaut, Mr. Ivan Bella, on the space station MIR in February 1999. The government expressed, then, its support for the participation of the Commission and Research Institutions in Slovakia, in all activities of COPUOS, and other international organisations related to the peaceful uses of space research and to the participation of Slovak research institutions in the projects performed on the International Space Station. A green light was given to a proposal to launch NASA activities in Slovakia in the frame of the project of Scientific-technical Park EuroValley.

Although Slovakia is quite active and successful in the above mentioned fields of research in outer space (I have in mind natural and technical sciences), I have to admit that Space Law is unfortunately still in a position of a "Cinderella". I do not want to say that nobody is dealing with it, for that would be untrue, nevertheless, our legal scientists and scholars do not yet pay adequate attention to it. The reasons we can probably find in objectively limited sources due to an economy in transition for uses and research of space and I, as a lawyer and member of the Slovak International Law Association, dare say, in a current period of somewhat of a stagnation of International Law science in Slovakia in general.

There is no special national space legislation in Slovakia yet and four UN Conventions (except the Moon Agreement) to which Slovakia is a State Party and some other international instruments and GA resolutions represent so far the one and only source of space legislation. That means that it needs new development, which will lead to the promotion of space activities, including private ones.

Space law in Slovakia is lectured as a part of International Public Law at the Law Faculties in Bratislava, Trnava, Kosice and. B. Bystrica and as an autonomous topic, although in a simpler way in technical universities. The research of Space Law should be the task of the Institute of State and Law of the Slovak Academy of Sciences (and Law Faculties).
The responsibility for implementation of Space law in Slovakia lies mainly with the Civil Aviation Authorities and Telecommunication Authorities, which are subordinated to the Ministry of Transport, and on the Ministry of Environment, the Ministry of Defence and Ministry of Foreign Affairs.

Thank you for your attention.

Present Status of Space law, Policy, Institutions and Education in Uruguay

Marta Gaggero Montaner
Centro de Investigación y Difusión Aeronáutico-Espacial
Montevideo, Uruguay

Space Law

Uruguay is updated in reference to international conventions that rule the activities of states in outer space. It has ratified all space treaties:

- 1967 Outer Space Treaty. Ratified by Law Nº 13.654 of 4/6/70.
- 1968 Agreement on the Rescue of Astronauts. Ratified by Law Nº 13.685 of 17/9/68.
- 1971 Convention on International Liability. Ratified by Decree-law Nº 14.545 of 22/6/76.
- 1975 Convention on Registration. Ratified by Decree-law Nº 14.675 of 1/7/77.
- 1979 Moon Agreement. Ratified by Decree-law Nº 15.169 of 10/8/8

Uruguay has always supported the formulation of complementary norms of the general principles established in the Outer Space Treaty of 1967. It follows that, in this way, the principle of Common Heritage of Mankind (CHM) can be put into practice with all the corollaries derived and have been protected by all legal instruments in force.

Space activities are developed by a selected group of states and private enterprises. Through international cooperation, developing countries, which mostly do not participate in those activities, must on the one hand strengthen their scientific capacity, taking profit from the available means on the regional level, according to universal efforts and goals. On the other hand, they must become aware and demonstrate their real interest in the access to definite and practical possibilities brought by Space Age, asking for their rights, but at the same time, assuming the correlative and inevitable responsibilities.

According to Latin American doctrine, Uruguay supports the idea that cooperation is an obligation and should not limit itself to the technological field but should also cover the legal field.

By means of participation, attendance and discussion in specialised forums like the COPUOS, we would be promoting international cooperation.

Uruguay has been a member of COPUOS since 1981 and has supported its work by adhering to the space treaties, having always in mind the CHM principle.

Cooperation must take place between all countries, developed and developing, and in fact, it should be demonstrated through the active participation in the elaboration of Space Law and in the ratification of the legal instruments in force. Through ratification or adherence to these instruments, developing states, with their compromise of action, will give impulse to the strengthening of the legal regulation.

Law is the most important tool that developing states have to make sure that space activities serve the interests of all states and of Humankind as a whole.

Space policy and institutions

Uruguayan space policy, established by Governmental Decree Nº 325/974 of 26/4/74, basically supports the diffusion of space issues and the participation of the country in international programmes and researches.

According to it, the Centro de Investigación y Difusión Aeronáutico-Espacial (CIDA-E) was created in 1975, with the following functions, among others:

- Study and promote the study of space problems.
- Give its advice and collaborate with public and private organizations.
- Conduct studies and research on those space issues that are of national interest, and from which advantages can be derived from the practical point of view .
- Study and carry out research on the legal problems derived from the exploration and use of outer space, the Moon and other celestial bodies.
- Conduct studies on Space Law so as to promote an adequate regulation and updating, both on the national and international level.

In that sense, the CIDA-E has always collaborated with the Ministry of Foreign Affairs so as to set up the position of Uruguay in the specialised organizations (UN, COPUOS, etc.).
Based on its studies and researches, the Government approved all space treaties.

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By Governmental Decree Nº 369/991 of 16/7/91 the Aerospace Remote Sensing Services was established with the following main functions:

- Direct, execute, supervise, develop and co-ordinate all the activities related to the use of Aerospace Remote Sensors.
- Plan and execute the reception, processing and use of the information resulting from Aerospace Remote Sensors.

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In 1996, the Third Space Conference of the Americas (III CEA) was held in Punta del Este, Uruguay, and coincidentally, Uruguay assumed the Pro-Tempore Secretariat (SPT) responsibility, which it kept until the celebration of the IV CEA, which was held this year in Cartagena de Indias, Colombia.

During this period, the SPT organised several seminars and conferences, where outstanding international specialists treated the most relevant space issues, including space law.

The SPT promoted the establishment of the Advisory Commission on Space Technology (CATE) that has as its main goal, to make an analysis on the state of space technology in Uruguay and set the basis of a future National Plan of Space Technology.

The CATE promoted the CREPADUR project (Centre for the Reception, Process, File and Dissemination of Earth Observing Data). The project has the financial and technical support of the Spanish Agency of International Cooperation (AECI) and the National Institute of Aeronautic Technology, and will be operating soon.

Education

Since 1966 a systematic course of Aeronautic Law (which includes Space Law) is offered at the Faculty of Law of the University of the Republic.

In the same Faculty, a permanent Aeronautic and Space Law course, which began in 1975 as an extra-curricular subject, is now offered at the post-graduate level.

Other subjects like Public International Law and careers like International Relations exist where Space Law is also addressed.

In other institutions, which do not belong to the University, Space Law is taught as well. These include the School of Command and Aeronautic Staff, the Centre of National High Studies, and the Military Institute of Superior Studies.

With the aim of spreading the knowledge of Space Law, the CIDA-E organises symposia and workshops on space issues and its annual review publishes articles of well-known specialists in the field.

Conclusion

From the very beginning of the Space Age, Uruguay, a South American developing state, has directed its actions towards teaching and researching at the domestic level and co-operating in the elaboration and observance of Space Law rules at the international level.

Today, despite the social, economic and political crisis we are going through, we are making our best efforts to continue in the same direction.

In that sense, there are different initiatives that establish close links with other organizations or institutions; at the national level, with the Faculty of Engineering of the University of the Republic, and, at the international level with the Aeronautic Institute of Córdoba, Argentina and the Chilean Space Agency.

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Observations and Recommendations of the Workshop

A. United Nations treaties on outer space: benefits to States parties

The Workshop recommended that States and international organizations should become party to the United Nations treaties on outer space (or declare their acceptance of the rights and obligations in the relevant treaties in the case of international organizations), before carrying out space activities such as space launches, satellite operations or the formation of a national space agency.

The Workshop noted that the United Nations treaties and principles on outer space contained practical benefits that applied both to space-faring and non-space-faring nations. Under the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI), annex), the exploration and use of outer space must be carried out for the benefit and in the interest of all countries. The United Nations treaties and principles on outer space established an international legal regime that contributed to the maintenance of international peace and security and within which space activities were conducted. By becoming parties to those treaties, States participated in a more stable and predictable global regime and fulfilled their responsibility as members of the international community. The Workshop recommended that action be taken to make non-parties to those treaties aware of the benefits of the treaties and principles, which included the following:

Under the Rescue Agreement, States with reason to believe that a space object discovered on their territory is of a hazardous nature may notify the launching authority, which must immediately take effective steps to eliminate possible danger;

The Liability Convention establishes one of the most victim-oriented international liability regimes in existence. This benefits all Parties to the agreement, since space objects can cause damage in any country, whether space-faring or not;

The Registration Convention enables States on whose territory a space object has landed to identify the object and the State or States that launched it.

The Workshop urged all States that had not yet become parties to the United Nations treaties on outer space to consider ratifying or acceding to them. To assist that process, the Workshop recommended that the Office for Outer Space Affairs of the Secretariat write an official letter to the governmental bodies of States that were not yet parties to the United Nations treaties on outer space, referring to General Assembly resolutions and other official documents.

B. Priorities for national space law development

The Workshop noted that appropriate national space legislation should be a high priority for States involved in space activities.

The Workshop recommended that capacity-building efforts take into account the individual differences between States, including those between developing countries, in particular the stage of economic and social development, the country's legal tradition and the exact nature of space activities carried out by the State concerned. National legislation should be adapted to national needs, taking into account practical applications.

The Workshop noted that States implemented their obligations under the treaties through national law. In that respect, the Workshop recommended that the Office for Outer Space

Affairs develop basic elements that could be included in national space legislation and licensing regimes.

The Workshop noted that the protection of public health and safety, property and the environment, including limited natural resources, was an important factor underlying many existing national space licensing regimes. The Workshop recommended that States involved in space activities develop similar licensing regimes for the benefit of the public.

The Workshop noted that the activities of national space institutions might have to evolve in response to changing circumstances and technical and economic development. For that reason, the Workshop recommended that laws establishing national space policies and institutions be drafted to allow for flexibility.

C. Priorities for education in space law

The Workshop recommended that promotion of education in space law be approached on at least two levels, including both university programmes and curricula for students and educators and short courses designed for professionals and decision makers.

The Workshop recommended that States review their need for professionals in space policy and law. Educational programmes in space law could be developed in response to long-term needs.

The Workshop recommended that university programmes and curricula in space law take into account international treaties related to space activities as well as developments such as the enactment of national space laws and the increasing privatization and commercialization of space activities. They should consider an interdisciplinary approach and employ all possible avenues of international cooperation, including exchange programmes (whether in person or online), joint research programmes, scholarships, internships and international moot court competitions.

The Workshop recommended that intensive, short-term workshops and regular training courses be held in specific States and regions in order to build capacity in space law and related fields. Workshops should be open to decision and policy makers, students, educators and professionals involved in space activities.

The Workshop recommended that the regional centres for space science and technology education, affiliated to the United Nations, include a basic course on space law in their curricula.

It also recommended that initiatives to create space law databases include information on institutions that provide courses in space law and policy.

It further recommended that a short lecture series on principles of space law aimed at professionals and students be developed by the International Institute of Space Law and be disseminated on a priority basis by the Office for Outer Space Affairs via videotape, the Internet or other media.

It also recommended that capacity-building activities focus on education at all levels of society as to how space activities could further national development goals

D. Future Work

The Government of the Netherlands was invited to give a detailed presentation on the Workshop at the forty-second session of the Legal Subcommittee. The presentation could include a summary of the themes that had been discussed by the Workshop, including important themes on which the Workshop had made no specific recommendations.

The Workshop considered it important that there be continuity and regularity in the United Nations workshops on space law and recommended that the activities for capacity-building in space law of the Office for Outer Space Affairs be continued. The Workshop welcomed the offer by the Republic of Korea to host the Second Workshop on Capacity-Building in Space Law between September and November 2003 and looked forward to more information on arrangements for that workshop being made available by the Office for Outer Space Affairs.

The Workshop expressed its appreciation to the Government of the Netherlands, the International Institute of Air and Space Law of the University of Leiden and the Office for Outer Space Affairs for organizing the Workshop.

Programme

MONDAY
18 NOVEMBER 2002

08:15 - 09:00	Registration
09:00 - 09:45	Opening Ceremony and Welcoming Statements
	F.A.M. Majoor Secretary-General of the Netherlands Ministry of Foreign Affairs
	Tj.T van den Hout Secretary-General of the Permanent Court of Arbitration, The Hague
	P. Lála United Nations Office for Outer Space Affairs
SESSION 1	**INTERNATIONAL LEGAL REGIME FOR OUTER SPACE**
	Chair: P. Lála United Nations Office for Outer Space Affairs
09:45 - 10:30	*Introduction to the United Nations treaties and principles on outer space* V. Kopal Chairman, Legal Subcommittee, United Nations Committee on the Peaceful Uses of Outer Space
10:30 - 10:45	Coffee/Tea Break
10:45 - 11:30	*The Liability Convention* A. Kerrest Brest University, France
11:30 - 12:00	*The Registration Convention* P. van Fenema McGill University, Canada
12:00 - 12:15	*The United Nations Register of Objects Launched into Outer Space* P. Lála United Nations Office for Outer Space Affairs
12:15 - 12:30	*Procedures for return of space objects under the Rescue Agreement* K. Hodgkins United States Department of State
12:30 - 14:00	Lunch Break

14:00 - 14:30	*The International Telecommunication Union (ITU) and coordination of space telecommunications* R. Smith International Telecommunication Union
14:30 - 15:00	*Project for a draft protocol on space assets to the Convention on International Interests in Mobile Equipment* O. Ribbelink Asser Institute
15:00 - 15:30	*The European Organisation for the Exploitation of Meteorological Satellites (EUMETSAT): an example of regional cooperation in space activities* P. Hulsroj European Organisation for the Exploitation of Meteorological Satellites
15:30 - 15:45	Coffee / Tea Break
15:45 - 16:15	*Bilateral and multilateral cooperation agreements* M. Ferrazzani European Space Agency
16:15 - 18:00	**Round Table Discussion 1:** **United Nations treaties on outer space – benefits to States Parties** **Chair***:* Judge V.S. Vereshchetin International Court of Justice

TUESDAY
19 NOVEMBER 2002

SESSION 2	**NATIONAL SPACE LAWS**
	Chair: M. van der Zee Director of Economic Cooperation, Netherlands Ministry of Foreign Affairs
9:00 - 9:30	*The Australian Space Activities Act 1998: building the regulatory capacity for a launch industry* R. Lee Hunt & Hunt Lawyers, Australia
9:30 - 10:15	*Brazilian launch licensing regime* J. Monserrat Filho Brazil
10:15 - 10:30	Coffee/Tea Break

10:30 - 11:00	The *first administrative regulation on space activities in China* Liu Xiaohong China National Space Administration
11:00 - 11:30	*Swedish space legislation* N. Hedman Swedish Ministry for Foreign Affairs
11:30 - 12:00	*Russian space legislation* A. Fassakhova Russian Federation
12:00 - 12:30	*United Kingdom Outer Space Act* T. Ballard Field Fisher Waterhouse, United Kingdom
12:30 - 14:00	Lunch break
14:00 - 14:30	*The United States National Aeronautics and Space Act* R.M. Stephens Deputy General Counsel, United States National Aeronautics and Space Administration (NASA)
14:30 - 14:45	*The United States Commercial Space Act* K. Hodgkins United States Department of State
14:45 - 15:15	*Indian space program and its policy dimensions* R. Lochan Indian Space Research Organisation (ISRO)
15:15 - 15:30	Coffee / Tea Break

Specific issues

15:30 - 16:00	*A beginner's guide to international law of remote sensing* I. Gabrynowicz Remote Sensing and Space Law Center, University of Mississippi, U.S.A.
16:00 - 16:45	*Laws and policies for telecommunications* S. Mosteshar Mosteshar Mackenzie
16:45 - 17:15	*Satellite insurance* P.R. McDougall Munich Reinsurance Company
17:15 -	*Reception and guided tour of the Mauritshuis, The Hague* Hosted by the Netherlands Ministry of Foreign Affairs

WEDNESDAY
20 NOVEMBER 2002

SESSION 2	**NATIONAL SPACE LAWS (continued)**
09:00 - 09:30	*Laws and policies to promote private space industry* P. Nesgos Milbank Technology and Communications Group
09:30 - 10:00	*Intellectual property law and space activities* T. Miyamoto World Intellectual Property Organization
10:00 - 10:15	*Space policy and institutions in the Republic of Korea*
10:15 – 10:30	*Space policy and institutions in Malaysia* F. Hashim National University of Malaysia
10:30 - 10:45	Coffee / Tea Break
10:45 - 11:15	*Indian space law and policy: a private sector perspective* M. Pracha Organisation for Promotion of Legal Awareness, India
11:15 - 12:45	**Round Table Discussion 2** *Priorities for national space law development* **Chair:** S. Ospina University of Miami School of Law
12:45 - 14:00	Lunch Break
SESSION 3	**EDUCATIONAL PROGRAMMES IN SPACE LAW**
	Chair: F. von der Dunk International Institute of Air and Space Law, Leiden University
14:00 - 14:45	*Overview of educational programmes in space law* F. von der Dunk International Institute of Air and Space Law, Leiden University
14:45 - 15:05	*Educational programme at the University of Miami School of Law* S. Ospina University of Miami School of Law
15:05 - 15:30	*Presentation on the educational programme of the European Centre for Space Law* S. Marchisio European Centre for Space Law

15:30 - 15:45	Coffee / Tea Break
15:45 - 16:15	*Space law database* S. Negoda Ukraine
16:15 - 16:45	*Presentation on space law activities at the International Space University (ISU)* P. Achilleas International Space University
16:45 - 18:00	*Short presentations on specific countries*

	16:45 - 16:55	*Argentina* O. Fernandez-Brital School of Law, University Institute of the Argentine Federal Police
	16:55 - 17:05	*Zimbabwe* D. Mapimhidze Zimbabwe Attorney General's Office
	17:05 – 17:15	*Application of space science and technology in the Americas and its benefits for civil society* C. Arevalo Permanent Mission of Colombia to the United Nations (Vienna)
	17:15 – 17:25	*Morocco* M.S. Riffi Temsamani Royal Centre for Remote Sensing
	17:25 – 17.35	*Slovakia* M. Kollar Slovak Embassy in The Netherlands

18:00 -	*Buffet dinner* Hosted by the Netherlands Ministry of Economic Affairs

THURSDAY
21 NOVEMBER 2002

9:00 - 10:30	**Round Table Discussion 3** **Priorities for education in space law** **Chair:** S. Hobe Cologne University
10:30 - 10:45	Tea / Coffee Break

CONCLUSIONS OF THE WORKSHOP

Chair:
V. Kopal
Chairman, Legal Subcommittee, United Nations Committee on the Peaceful Uses of Outer Space

10:45 - 12:30	Development of conclusions (General Discussion)
12:30 - 14:00	Lunch break
14:00 - 15:30	Review of draft conclusions
15:30 - 15:45	Tea / Coffee Break
15:45 - 18:00	Review of draft conclusions

United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law

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United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law

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United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law

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United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law

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United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law

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United Nations/International Institute of Air and Space Law Workshop on Capacity Building in Space Law

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