

**REVISITING THE REGISTRATION CONVENTION:
A Proposal to Meet the Need to Know "What is Up There"**

Sylvia Ospina, J.D., LL.M.

Abstract

In the last few years many new satellite systems have been developed and launched under the auspices of private multi-national corporations. It would seem that some of the new operators are unfamiliar with the 1976 Convention on Registration of Objects Launched into Outer Space, or other treaties related to outer space activities. Consequently, many of the launches are not in full compliance with the principles set forth in the international space-related treaties.

While some persons may believe that the time has passed for the involvement of governments and of the international community in outer space activities, it is submitted that, on the contrary, the time is at hand for such involvement on a greater scale.

This paper includes a few recommendations, a few steps and measures that could be taken to insure compliance with the Registration Convention, as well as with other principles of space law found in the various United Nations treaties and resolutions. Thanks to new technology, registering a space object

does not have to be an onerous task. Rather, compliance with the Registration Convention may safeguard the huge investments of the multi-national enterprises, while ensuring the safe orbiting of their spacecraft.

INTRODUCTION

Activities in outer space have increased exponentially within the last two decades. While in the 1970s there were a few communications satellite systems in operation, currently more than twenty States and various consortia operate such systems. Simultaneously, the need to keep track of the growing number of spacecraft in orbit has increased, for a variety of reasons.

This paper will examine the United Nations Convention on Registration of Objects Launched into Outer Space,^{1/} and the International Telecommunication Union's notification process. It will also highlight a few points of a draft Convention on International Interests in Mobile Equipment, proposed by UNIDROIT.^{2/}

The ultimate goal of the three is to have information on objects launched to outer space, to "know what is up there". The reasons for wanting to have this information differ among these entities. Some of these issues will be addressed in this paper.

The Need for Registration of Vehicles, including Space Objects

There are certain reasons for requiring the registration of a vehicle, whether that vehicle is an automobile, an aircraft or a spacecraft. The State authorities need to

International Telecommunications / Space
Law Consultant; Senior Member, AIAA.
Contact: sospina@bellsouth.net

©Sylvia Ospina 2000. Published by the AIAA
with permission.

have some information as to the kind of vehicle, for ownership (title), insurance and liability purposes. Usually automobiles are not allowed to circulate on the roads without visible signs of registration (such as a license plate with a number). Further, vehicles are usually registered with only one authority; i.e., they should not have multiple registrations. (Similarly, the Registration Convention states that there is to be only one State of Registry for any given space object.)^{3/}

Vehicles not properly registered may be impounded or confiscated by the authorities, and disposed of by them. While spacecraft may not be impounded once they have been launched, the revenues generated from their services could be subject to seizure. Should failure to register a spacecraft be subject to other sanctions, similar to those imposed on terrestrial vehicles not properly registered?

The drafters of the space treaties were mindful of the need to know what kind of space objects were being launched, and thus drafted the Registration Convention. Highlights thereof are set forth below.

The Registration Convention

The Convention on Registration of Objects Launched into Outer Space is based on UN General Assembly Resolution 1721 B (XVI) of 1961, which requested that States launching objects into outer space furnish information to the UN Committee on the Peaceful Uses of Outer Space (COPUOS) for registration with United Nations Secretary General.^{4/} Between 1961 and 1974, several drafts or versions of the convention were reviewed by COPUOS; the final version was opened for signature in 1975, and entered into force in September 1976.

It is a relatively short and straightforward document. In essence, it calls on launching States to establish a National Register in which to enter certain information on the space object launched. The States are urged to notify the UN "as soon as practicable", of the information entered into

the National Register, so that it may be included in the United Nations Register.^{5/}

The Preamble states that "...a central register of objects launched into outer space [shall] be established and maintained, on a **mandatory** basis, by the Secretary-General of the United Nations..." [emphasis added.]

The Preamble also mentions other space treaties in force at that time. Thus, the launching States are to "[r]ecall their ...international responsibility for their national activities..." under the terms of Art.VIII of the Outer Space Treaty.^{6/} In addition, they shall "recall" the Liability Convention,^{7/} which "...establishes international rules and procedures concerning the liability of launching States for damage caused by their space objects..." There is no further mention of the Liability Convention in the main text of the Registration Convention, although the Outer Space Treaty is mentioned again in Art. VII.

At the core of the Registration Convention is the establishment of a **National Registry** of objects launched into outer space. Subsequently, the State of Registry of the space object is to notify the UN to the effect that it has established the (national) Register, and also record the notification in the Register maintained by the of the United Nations Secretary-General (UNSG). This notification is usually done *post launch*, if at all.

The Registration Convention stipulates that there be only one State of Registry; i.e., the space object is entered into the National Register of only one State, even though there may be two or more launching States.^{8/}

The Convention asks for few data on the object launched into outer space:

- State of Registry;
- Launching State or States;
- An appropriate registration number or designator of the space object;
- Date and territory / location of launch;
- Basic orbital parameters, such as nodal period, inclination, apogee, perigee;
- General function of the space object.^{9/}

The last requirement applies to both military and non-military spacecraft.^{10/}

While each State *may* provide additional information on space objects carried in its registry, it *shall* notify the UN Secretary General of space objects it *had* on its Registry, which no longer are in orbit.^{11/} The latter requirement reflects the States' jurisdiction, control over, and liability for damage caused by its space objects, whether in outer space, in air or on earth.^{12/}

At the national level, several governmental entities are involved in obtaining the information required to register a space object: ministries regulating telecommunications, transportation, foreign relations, among others. These agencies vary from country to country, and will not be discussed in this paper.^{13/} It should be noted, however, that the State of Registry of the space object must have a National Register to that effect.

Hence, the information that the State of Registry is mandated to provide to the UNSG is or should be readily available in the National Register. Consequently, registering the space object with the UN in a timely manner is not an onerous duty, but it is essential, and should take place at a time certain, rather than "as soon as practicable."^{14/}

Notification to Other International Agencies

In addition to being entered in the National and the UN Registers, the space object is notified to other international entities, but prior to launch. For instance, most space objects use the radio frequency spectrum (RFS), and they are notified to the International Telecommunication Union (ITU) well in advance of their launch. The information required by the ITU is similar to that of the Registration Convention, although it is or will be used for different purposes.

The International Telecommunication Union (ITU) Notification Process

The International Telecommunication Union (ITU) is a UN specialized agency in charge of terrestrial and space telecommunications, particularly those that use the radio frequency spectrum (RFS). The ITU is involved in the allocation of orbital positions to satellites in geostationary orbit, and the radio frequency spectrum to different Services.^{15/} Its activities are aimed at making efficient use of the RFS in the provision of telecommunications worldwide.

Only one Administration^{16/} notifies the ITU of the space object(s) or satellite system that is planned or proposed. Similarly, only one State registers the space object with the UN Secretary-General under the Registration Convention.^{17/}

Unlike the Registration Convention (which appears to mandate *post launch* registration), the ITU requires notification *prior to launch* and *prior to the space object's coming into service*. Administrations have several years during which to register the radio frequencies to be used, and to carry out the required technical coordination of the proposed system with existing and other planned systems.

The notifying Administration compiles the information that is provided to the ITU from various sources, including the proponents of the satellite system. This information is published by the ITU, to facilitate its coordination with other satellite system(s), and use of the radio frequencies to avoid harmful technical interference between them.

The information submitted to the ITU's Radiocommunications Bureau (BR) includes, *inter alia*:

- the Member Administration doing the notification of the satellite system, even if it is owned and will be operated by a private consortium;
- orbital parameters, such as nodal period, inclination, apogee, perigee;
- general function or purpose of the space object or system

- (telecommunications, broadcasting, radio navigation, etc.);
- radio frequencies or bands (C-Band, Ku, Ka-Band, etc.) that are sought to be used for Fixed-Satellite Service, Broadcasting-Satellite Service, Mobile-Satellite Service, etc..
- information on the earth stations (antennas).

While the basic information provided to the ITU is similar to that required by the Registration Convention, the ITU process differs from the Registration Convention requirements in a few respects. For one, since notification to the ITU takes place several years prior to launch, information on the date, territory / location of launch usually is not available.

Further, it should be noted that geostationary and non-geostationary satellite systems are regulated by different sections of the International Telecommunication Union Radio Regulations (ITU-RR), presenting distinct coordination problems. While the notification process to the ITU insures that the geostationary satellites are located in an appropriate orbital slot or position, non-geostationary satellites do not require a fixed orbital position, since they are located in various planes or orbits. It should also be emphasized that the ITU has no jurisdiction or control over the choice or use of orbits; these are chosen by the designers and developers of the satellite systems.^{18/}

Regardless of how many satellites are proposed, and of their ultimate orbital location, all these systems must be notified to the ITU and coordinated prior to being brought into service, with any and all Administration(s) whose communications systems may be affected (subject to harmful interference) by the proposed system(s).

Within the past 5 years, hundreds of privately-owned and operated space objects (mostly non-geostationary satellite systems) have been launched. This launch pattern is likely to continue, increasing the need to know in what orbit(s) they are located, as well as the purpose of the system(s).^{19/}

Many of these systems have been subsumed under the designation of "Global Mobile Personal Communications Services", or GMPCS.^{20/}

Regulation of the GMPCS Systems and the Registration Convention

The new GMPCS ownership patterns raise questions as to their legal regulation, and compliance with treaties that were signed by States. Most GMPCS systems are owned and operated by multi-national consortia. Frequently the financial operations are incorporated into a "holdings company" under the laws of a tax-friendly State, while the laws of another country may control "operations". Further, the "State of Registry" and the ITU "Notifying Administration" may not be one and the same.

The GMPCS are regulated by private contractual arrangements and national law(s) rather than by international treaty.^{21/} To facilitate the implementation of these new systems, the Global Mobile Personal Communication Services Memorandum of Understanding, or GMPCS MOU, was drafted in the course of the ITU's World Policy Forum in 1996.^{22/}

The GMPCS MOU comprises a series of "Arrangements", or broad guidelines, which are not legally binding on the Signatories unless and until they are incorporated into national law or regulations. Hence, it is of limited legal value.

Currently, there are hundreds of geostationary and non-geostationary satellites in orbit, some in use, others no longer functional.^{23/} While they have been notified and coordinated under the terms of the ITU Radio Regulations, not all of them have been registered or de-registered under the terms of the UN Registration Convention.^{24/}

Thus, there is little reliable information or data as to what all is (still) up there, where it is, whether it is still operational or inactive. These space objects may be adding to orbital debris and to the potential hazards caused thereby. "Registration of spacecraft

...[is] an important instrument in the fight against the growing problem of clutter.”^{25/}

It should be recalled that, under the terms of the Outer Space Treaty, “States Parties to the Treaty shall bear international responsibility for national activities in outer space...” regardless of whether it is a governmental or private entity carrying out the activity.^{26/} Thus, in the case of a privately owned GMPCS system, “[a] State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object...” Furthermore, ownership of space objects is not affected by their presence while in outer space or on earth...^{27/}

The Liability Convention also imposes absolute liability on a Launching State for damage caused by its space object on the surface of the earth or to aircraft flight.^{28/} And, “[w]henver two or more States jointly launch a space object, they shall be jointly and severally liable for any damage caused.”^{29/}

Despite the requirements of the Registration Convention, and notification to the ITU, a major challenge remains: enforcement of treaty provisions. Most of these instruments provide no means for obliging States to register their space objects with the UN, or for ascertaining ownership of a space object for liability reasons. Will a new treaty, such as the one proposed by UNIDROIT simplify the situation?

UNIDROIT’s Proposed Convention on International Interests in Mobile Equipment, and International Registry

The International Institute for the Unification of Private Law, UNIDROIT,^{30/} has drafted and proposed a Convention on International Interests in Mobile Equipment.

UNIDROIT’s proposal is aimed at facilitating the privatization and commercialization of [outer] space, by protecting private investments in space. In essence, the convention would secure the financial interests of investors and others who have

provided funds for outer space – related projects.

UNIDROIT also proposes the establishment of an International Registry, to secure the financial interests of investors in space systems and other mobile assets, thereby providing “...third parties with public notice of that interest.”^{31/} “Registration is also key to the international interest’s validity against the trustee in bankruptcy and creditors in the obligor’s insolvency”^{32/}

Among the reasons stated for an International Registry, is that several international agencies are involved in licensing satellite systems, but “...[n]one of them can offer a comprehensive registry of licensing of orbits, frequencies and other rights... nor of financiers’ interests in them...”^{33/}

UNIDROIT’s “Draft Protocol on Matters Specific to Space Property” states that the [contracting States] are aware “...of the need for an international registration system as an essential feature of the legal framework applicable to international interest in space property...” Hence a permanent “International Registry Authority” should be created,^{34/} although its location or under whose auspices it will be have yet to be determined.

UNIDROIT’s drafters also propose to replace the term “satellite” with “space property”.^{35/} In addition to including physical, tangible objects or component parts (e.g., satellite transponders, space stations used for research and development), the new term would encompass “associated rights” related to “space property”, such as the rights of a purchaser or lessee of those rights.^{36/}

“Space property” would also include other intangibles, such as “permits, licenses, and authorizations granted or issued by a national or intergovernmental body or authority to control, use and operate the space property...” It would also include all proceeds (even from insurance) and revenues derived from the space property.^{37/}

Further analysis of these and other rights that would be considered "space property" are beyond the scope of this paper. As the drafters note, "an appropriate definition of 'space property' is key to this Protocol and its relationship with the [draft UNIDROIT] Convention..."^{38/} The proposed definition may need further refinement prior to its replacing the definition of "space object", as provided in the UN treaties.^{39/}

One item highlighted by UNIDROIT is the fact that several (national and) international organizations or entities are involved in different regulatory and /or registration aspects of space objects and activities: the ITU, and the UN, *inter alia*. Their function(s), goals, and procedures are quite different, and also different from UNIDROIT's proposal to create an "International Registry Authority", in which to enter the financial interests in space property. Could the proposed Authority adequately accomplish these different purposes, while representing and protecting these diverse interests?

Registering any financial interest in space objects or "space property" will be possible at the international level if and when UNIDROIT's proposed Convention and Protocol are signed and ratified by sufficient Parties. Or, if the information is made part of the Registration Convention, as proposed in the "Recommendations", below.

CONCLUSION AND RECOMMENDATIONS

The existing conventions of the United Nations, the International Telecommunication Union notification procedures and UNIDROIT's proposed Convention, have different objectives; these institutions have different reasons for, and interests in ensuring compliance with their registration / notification requirements.

One lacuna in all these processes is the fact that there at present no one single national or international entity has a centralized registry of space activities or objects. Nor is there an entity involved in planning or allocating the use of non-geostationary orbits, where the vast majority of the

privately owned and operated GMPCS satellite systems are or will be located. (These systems seem to be the focus of "space property" which UNIDROIT seeks to protect.)

Another omission becomes apparent when looking at the Registration Convention data base maintained by the Office of Outer Space Affairs of the UN. Some authors^{40/} have noted that the States providing information to the UN supply different data. Some include information on space objects only if they have reached their orbit while others notify the UNSG of objects that have been de-orbited.^{41/} Still others do not provide data on many of their launches. "As a consequence, the UN Register...is incomplete, which restricts its usefulness".^{42/}

The Registration Convention, however, affirms that "[t]he contents of each registry ... shall be determined by the State of Registry concerned."^{43/} Thus, although the State may be complying with the Registration Convention, the information transmitted to the UN may not be sufficient or reliable.

Better compliance with the Registration Convention is becoming more important, for several reasons. The large number of satellites in a variety of orbits, and the increasing number of countries with launch capabilities point to the need to have reliable information on what is up there, and where it is, in order to avoid harmful technical interference between satellite systems. Further, information on the location of a space object lessens possible collisions with man-made objects and with natural space debris. (The latter cannot always be tracked, due to its small dimensions.)

Since the satellites have been coordinated under ITU procedures, the information required by the UN Registration Convention is available from the States and Administrations. Once the space object has been coordinated through the ITU, and its launch reserved or acquired, it could or should be entered into the National

Register, and that information could and should be transmitted to the UN Secretary General, and made public. The entry in the Registers should occur prior to launch, rather than *post facto*.

Perhaps what is needed is better co-ordination amongst the entities responsible for transmitting the information to the ITU and to UN Secretary General. It is also suggested that Registration Convention could be updated and amended, and some means of enforcing existing treaty provisions should be instituted.

Article X of this Convention allows for its being amended, particularly to take into account "*any relevant technological developments, including those relating to the identification of space objects.*" [Emphasis added.]⁴⁴

Due to technological innovations, registration of space objects should be relatively effortless, since most, if not all information is now available in electronic form, and can be made accessible to all interested parties. UNIDROIT also proposes electronic registration of financial interests, accessible to parties concerned.

Other technological innovations, however, may lead to the redefinition of certain terms. For example, Art.I of the Registration Convention reiterates the definition provided in the Liability Convention of "Launching State":

- (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."

With the privatization of space activities, from launches to ownership and operation of satellite systems, one issue that is raised is whether private entities that are procuring both the launch and the spacecraft are included in the definition of "State" as defined in the Convention.

Another issue is whether (ii) of this definition includes facilities such as "Sea Launch", which is comprised of a platform located in

the high seas. Hence, "Sea Launch" is not located in any territory, nor do its facilities belong to a State; they belong to a consortium of private corporations. Perhaps a redefinition of "Launching State" will be necessary, so that it will include privately-owned launch facilities, whether in the high seas, or on the territory of another State.⁴⁵

In brief, compliance with the Registration Convention may be facilitated if this instrument is updated and expanded upon. The new text should reflect the private sector's growing role in space activities, including ownership, operations and responsibility or liability therefor.

RECOMMENDATIONS

The following recommendations, primarily related to the Registration Convention, are proposed. They are not in order of importance or priority; rather, it is submitted that the additional information sought would be of benefit to those involved in space activities, from the design of a system, its financing, and its implementation.

The term "*Space Object*" would be defined as "any man-made object or its component parts that is designed to be launched to and operate in outer space, or whose utility is dependent on its being in outer space. The object could be a space platform, a space probe, a launch vehicle, a satellite, or their various component parts."⁴⁶

It is also proposed that a time certain for registration with the national authority, and subsequently with the UN Secretary-General be included in the Registration Convention, replacing the current "as soon as practicable".⁴⁷ This time frame could be contingent on when certain licenses⁴⁸ have been granted by national authorities (the "Launching State").

The information (already transmitted to the ITU), which should be entered into the National Register, and subsequently in the Register maintained by the UN Secretary General (UNSG), can be separated into 4 general categories:

- Technical data;

- Financial / economic data on the system;
- Intended use / services to be provided;
- "Contact" information: Notifying Administration, Launching State, securing of financial interests, *inter alia*.

These are elaborated upon briefly.

A) Technical data / information:

- Information required under present terms of Art. IV of the Registration Convention, including:
- Proposed orbital location(s), whether in geostationary or non-geostationary orbits;
- Projected useful life in orbit of the space object;
- Plans for its de-orbiting at end of useful life.
- Date(s) of launch, and launch vehicle(s).^{49/}
- Other pertinent technical data already submitted to the ITU.

B) Financial Data:

- Primary owner(s) and operator(s);
- Names and legal domiciles of major financing entities, especially those that have registered or secured their interest in the space object or system.
- Place of registration of financial interests in the space object(s), providing third parties with public notice of that interest.^{50/}
- Insurance coverage obtained: for launch, for components, including launch vehicle stages, and against malfunction of the satellite, its components, or its operation.

C) Intended use / services to be provided by the space object(s):

- General purpose of the object, or of the satellite system: e.g. telecommunications, earth observation, etc.;
- Frequencies assigned, in which Service, as notified to the ITU.^{51/}

D) "Contact" information:

- Administration(s) notifying the ITU;
- Date of notification to the ITU;
- State of Registry;
- Date of entry into National Register.
- Launching State(s), for liability purposes.
- Insurance company or consortium providing insurance and coverage;
- Name and place of incorporation of principal owners / operator(s) of the space system.(As provided in Section "B", and for liability purposes).
- Place(s) of registration of financial interests in the space object(s).

The above information or data is of a general nature, and should be available to the public through the United Nations Secretary-General's Office. Financial, technical, and other information deemed to be of a confidential nature would not be included.

The modifications proposed above, in regard to the information to be entered in the United Nations Register in a timely manner, would not be difficult to implement.

Additional information, such as general information on the ownership of the space object possibly would meet UNIDROIT's objective- of providing public notice as to the interests that have been secured or registered. Information on financial matters could obviate the need for the establishment of another International Registry, as proposed by UNIDROIT.

In addition, sanctions could be applied for compliance or non-compliance with these requirements. For example, obtaining adequate insurance, or reimbursement thereof, could be made contingent on having registered the space object with the UN, prior to launch, rather than post launch. Further, insurance premiums could be reduced for timely submission of data for UN registration; conversely, indemnification or non-reimbursement of insurance (in the event of a mishap) could be withheld until

the system has been duly registered with the United Nations.

Compliance with the Registration Convention requirements (either as currently worded, or including the modifications proposed) will become increasingly important, especially as the private sector seeks to protect its massive investments in space systems.

In seeking this protection, however, certain fundamental principles firmly established in the Outer Space Treaty should be recalled: "... use of outer space shall be carried out for the benefit and in the interests of all countries...and [outer space] shall be the province of all mankind." Furthermore,

"Outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation or any other means."⁵² In other words, while space property may be privately owned, outer space should not be subject to privatization.

¹ Convention on Registration of Objects Launched into Outer Space. [Cited as the Registration Convention hereinafter.]

² UNIDROIT is the acronym for the International Institute for the Unification of Private Law. Its Headquarters are in Rome, Italy.

³ Art. II (2) states that "[w]here there are two or more launching States...they shall jointly determine which **one of them** shall register the object..."

[Emphasis added].

⁴ Matte, Nicolas M., The Convention on Registration of Objects Launched into Outer Space; pp.231-241, Vol. I, Annals of Air & Space Law (1976).

⁵ Art. IV (1), Registration Convention.

⁶ The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies. Entered into force 10 October 1967.[Cited as the Outer Space Treaty hereinafter.]

⁷ Convention on International Liability for Damage Caused by Space Objects. Entered

into force 1 September 1972. [Cited as the Liability Convention hereinafter.]

⁸ Art. II (2), Registration Convention.

⁹ Article IV, Registration Convention.

¹⁰ Matte states that since no distinction is made in Resolution 1721 B (which is the foundation of the Registration Convention), it should be concluded that the Resolution, and by extension the Convention, should apply to both types of spacecraft. (Op. cit. *supra*, note 4, p. 21).

¹¹ Art. IV (2), (3), Registration Convention. [Emphasis added].

¹² Art. VII, VIII, Outer Space Treaty. De-orbited satellites (and /or those that have been transferred to another owner / operator?) must be notified to the UN.

¹³ Ascertaining which is the appropriate national agency that maintains the Register may be a challenge!

¹⁴ Art. IV (3), Registration Convention. The question is whether this notice applies only to de-orbited satellites, or to those that will be launched. If they are entered into the National Register, the information should be transmitted to the UNSG, as per Art. IV (1).

¹⁵ The ITU allocates different frequencies to different services, among them the Fixed-Satellite Service (FSS); Broadcast-Satellite Service (BSS); Mobile- Satellite Service (MSS), Radio Navigation Satellite Service (RNSS).

¹⁶ The ITU Radio Regulations (ITU-RR) define Administration as "any governmental department or service responsible for discharging the obligations undertaken in the [ITU] Convention and Regulations. Chapter I, Art. I, Sec. I, 1.1; ITU-RR.

¹⁷ Art. II (2), Registration Convention.

¹⁸ Satellites in geosynchronous orbit are located at 37000 km. above the Equatorial plane. Non-geostationary satellites are located in a variety of orbits or orbital planes, ranging from 400 km. to 24000 km. above sea level.

¹⁹ In addition to telecommunications satellites, remote-sensing or earth observation and imaging satellites (e.g., LANDSAT, SPOT Image) are in non-geostationary orbits.

²⁰ Among the GMPCS systems already launched are IRIDIUM (66+ satellites); ORBCOMM (36+ satellites); GLOBALSTAR

(48+ satellites). Other proposed systems in geostationary and non-geostationary orbits include ICO-TELEDESIC (at least 10, but maybe up to 288 satellites); Skybridge (77+ satellites); Spaceway; Final Analysis, Ellipso. This list is not exhaustive.

²¹ The operations and services provided by international intergovernmental satellite organizations (ISOs), such as INTELSAT, INMARSAT, EUTELSAT, are subject to the treaties or agreements between these organizations and the Member States. These organizations are in the process of being "privatized". Thus, their treaty obligations will be changing; the new corporations will be subject to private, rather than public international law.

²² The Global Mobile Personal Communication Services Memorandum of Understanding (GMPCS MOU) has been signed by more than 125 entities, including Administrations, telecom system operators and equipment manufacturers.

²³ The fate of "useless" non-geostationary satellites, such as IRIDIUM's constellation of 66+ satellites, has yet to be determined. One proposal is that they be do-orbited and allowed to burn up upon reentry to the Earth's atmosphere.

Geostationary satellites that have reached the end of their useful life are often placed in a "graveyard orbit" at 50000 km.

²⁴ Art. IV (3), Registration Convention states that "[e]ach State of Registry shall notify the UN Sec. General...of space objects concerning which it has previously transmitted information, and which have been but no longer are in earth orbit."

²⁵ Matte expressed concern about the "clutter" existing in 1976; since then, hundreds of space objects have been launched to outer space, increasing the clutter. Matte, N., The Convention on Registration of Objects Launched into Outer Space, p.232, Vol. I, Annals of Air & Space Law (1976).

²⁶ Art. VI, Outer Space Treaty.

²⁷ Art. VIII, Outer Space Treaty.

²⁸ Art. II; Liability Convention. There may be a typographical error in the English version of this Convention: omission of "in". There is a vast difference between damage caused to "aircraft flight" (interference with

its navigation?), and "aircraft *in flight*" (those in the act of flying?)

²⁹ Art.V(1), Liability Convention.

³⁰ UNIDROIT is the acronym for the International Institute for the Unification of Private Law. Its Headquarters are in Rome, Italy.

³¹ Stanford, Martin: The Roles of International Organisations in Privatisation and Commercial Use of Outer Space: UNIDROIT's project for the creation of a new regime governing the taking of security in high-value mobile assets: a window of opportunity in the context of the privatisation and commercial use of outer space. UNISPACE III: Workshop on Space Law in the 21st Century, Session 6.(Vienna, Austria, 20-23 July 1999). [Cited as Stanford hereafter.]

³² Idem; pp.3-4. UNIDROIT's proposed validity of the (registered) interest against a trustee in bankruptcy is worth noting, in view of the filing for bankruptcy protection ("Chapter 11") in August 1999, by two GMPCS systems - IRIDIUM and ICO Global Communications.

³³ Stanford, op.cit.

³⁴ Stanford, op.cit., provides as an Annex the "Preliminary Draft Protocol on Matters Specific to Space Property". Ch.I, Art.I (2).

³⁵ Stanford, op. cit., p. 6.

³⁶ Stanford, op.cit, p.6.

³⁷ Idem; Ch.I, Art.I (2) (a) (i-vi).

³⁸ Stanford, op.cit., FN. 2, p.6. The annexed "Preliminary Draft Protocol on Matters Specific to Space Property" provides a definition of "Space property"; Ch.I, Art.I (2) (a) (i-vi).

³⁹ Art.I (d) of the Liability Convention provides a rather circular definition of "space object": the term includes "parts of a space object as well as its launch vehicle and parts thereof." "Space object" *per se* is not defined. On the other hand, the Registration Convention calls for the registering of "objects launched into outer space". Such objects would seem to include launch vehicles, satellites, space probes, component parts of space stations, *inter alia*. UNIDROIT's definition would also comprise these physical objects launched into outer space.

⁴⁰ Matte expressed concern regarding the lack of particulars that were reported to the UN in 1976! (Cf. op. cit., pp. 233-234).

⁴¹ L. Perek, "Maintaining the Space Environment". Discussion Paper presented at Workshop on Space Law in the 21st Century. UNISPACE III, Vienna, Austria, 20-24 July 1999. Perek notes that only 40 States adhere to the Registration Convention, and that international organizations do not register their satellites. (The Administration where the International Satellite Organizations (ISOs) are headquartered is the entity that notifies the ITU, and by extension, should be the State that registers the spacecraft with the UN, even though it is not entered into the National Register.)

⁴² Perek, op.cit. One very complete database is J. McDowell's, available electronically at www.harvard.edu/QEDT/ or www.jcm/space/un/un.html.

⁴³ Art. II (3), Registration Convention.

⁴⁴ Art. XXV and XXVI of the Liability Convention provide for its amendment, and procedures therefor.

⁴⁵ Beal Aerospace, a Texas corporation, is seeking to establish a private "space port" in Guyana. See p. 6, SPACE NEWS, 14 August 2000. Would Guyana be considered a Launching State, even though Beal is incorporated under the laws of a different country?

⁴⁶ Under UNIDROIT's proposed definition, an object would not become "space property" until it is in space. (Art.I, (2) (a), Preliminary Draft Protocol on Matters Specific to Space Property. For insurance purposes, however, an object that is *supposed* to reach outer space is insurable, allowing investors and owners of those space objects to be indemnified in the event that their launch is not successful.

⁴⁷ Art. IV(1), (3); the latter section requires notification to the UNSG of space objects which are no longer in orbit.

⁴⁸ The term "license" is used generically, to include authorizations, permits, etc. However, distinctions should be made between licenses that may be required: a) to construct, build a satellite system; b) to operate said system; c) to provide certain services via that system; d) to use certain

frequencies of the radio spectrum; e) license to export the satellite, both to the launch site and to outer space.

⁴⁹ This information is or should be known to the system owner(s), as well as to the insurance corporation(s) several months prior to launch.

⁵⁰ Stanford, op.cit.: UNIDROIT proposal.

⁵¹ See note 15, *supra*, as to ITU Service(s).

⁵² Art.I, Art. II, Outer Space Treaty.