ON-ORBIT TRANSFER OF SATELLITES BETWEEN STATES: LEGAL ISSUES

WITH SPECIAL EMPHASIS ON LIABILITY AND REGISTRATION

by

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ABSTRACT

Space has become highly commercialized and satellites are treated as transferable goods, even while they are on orbit. Although the existing international space law regime allows such transfers, it also raises some serious questions especially with regards to registration and liability. The insufficiency of the present legal framework is rooted in the cause that the space treaties were drafted decades ago, and it was not possible to contemplate on-orbit transfers at that time. Under present regime of space law, in case of an inter-State on-orbit transfer of satellite, there may be a State having *de jure* jurisdiction and control over a space object, for which it is liable, while another State has *de facto* control over the space object and is responsible, as it is that State's national activity.

In this context, finding a pragmatic solution, while keeping in mind the interests of the victims, the transferor and the transferee, is imperative. Consequently, it is important to analyze whether the current framework of law is competent to deal with the issue, or whether the existing law needs to be amended. Because on-orbit transfers are happening now and will increase in the future, the topic is an extremely significant one and addresses a practical problem.

RÉSUMÉ

L'espace s'est fortement commercialisé et les satellites sont traités comme des biens aliénables, même lorsqu'ils sont déjà placés en orbite. Bien que le droit spatial international autorise déjà de tels transferts, certaines questions demeurent, notamment en ce qui concerne la responsabilité et l'immatriculation des satellites. Les lacunes du présent régime sont dues au fait que les conventions concernées ont été adoptées il y a plusieurs décennies. A cette époque, les transferts de satellites n'avaient pas été prévus. Le cadre légal actuel prévoit qu'un Etat peut avoir le contrôle légal d'un satellite alors même qu'il n'en a pas le contrôle effectif, et qu'un autre Etat peut en être responsable, si l'un de ses nationaux l'opère. Dans ce contexte, une solution pratique prenant en compte les intérêts des victimes, du cédant et du cessionnaire doit impérativement être adoptée. De ce fait, l'analyse du cadre légal actuel est importante pour savoir si un amendement est nécessaire. Etant donné que le phénomène de transfert de satellites placés en orbite a déjà lieu de nos jours et prendra de plus en plus d'importance dans le futur, ce sujet concerne un problème prégnant.

ACRONYMS AND ABBREVIATIONS

ABS	Asia Broadcast Satellite
AECA	Arms Export Control Act
AST	Asia Satellites Telecommunications Co.
CCL	Commerce Control List
CoCom	Co-ordination Committee for Multilateral Export Controls
COMSAT	Communications Satellite Corporation
COPUOS	Committee on the Peaceful Uses of Outer Space
DDTC	Directorate of Defense Trade Controls
DoC	Department of Commerce
DoS	Department of State
EAR	The Export Administration Regulations
EU	European Union
FAA	Federal Aviation Administration
FDI	Foreign Direct Investment
GA	General Assembly
GEO	Geostationary Earth Orbit
GLSV	Geosynchronous Satellite Launch Vehicle
ICBM	Inter-continental Ballistic Missile
ICJ	International Court of Justice
IISL	International Institute of Space Law
ILS	International Launch Services
ISRO	Indian Space Research Organization
ITAR	International Traffic in Arms Regulations
ITU	International Telecommunication Union
LEO	Low Earth Orbit
LKEI	Lockheed Khrunichev Energia International
LMI	Lockheed Martin Intersputnik
LMSCV	Lockheed Martin Space and Communications Venture

LSC	Legal Sub-committee
MSC	Mabhay Satellite Corporation
NDAA	National Defense Authorization Act for Fiscal Year
NSAB	Nordic Satellite AB
PCIJ	Permanent Court of International Justice
Res	Resolution
SingTel	Singapore Telecommunications Ltd
TT&C	Telemetry, Tracking and Command Systems
UK	United Kingdom
UN	United Nations
USA	United States of America
USML	United States Munitions List

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INTRODUCTION

Mankind's journey from Sputnik, the first artificial satellite launched, to Virgin Galactic's sub-orbital spaceplane SpaceShip Two[1] is one "from Scientific Exploration to Commercial utilization."[2] Today, space has become a part of our lives. Our everyday life is dependent on satellite services such as telecommunications, navigation, broadcasting and weather forecasting. An outcome of commercialization and privatization of space activities[3] is that satellites, which were once regarded as symbols of national prestige, are now being bought and sold like any other commodity, even while they are on-orbit.

Laws governing outer space, however, create serious legal difficulties to such transfers. These problems relate to responsibility, liability, registration and return of satellites under international space law, as well as export control laws and other barriers imposed by national legal systems. In addition to creating confusions, the existing laws have the effect of restricting and at times, even prohibiting, transfer of satellites.

On-orbit satellite transfers are happening and will become popular in future.[4] Such transfers allow the easy adaptability of a fleet of satellite to market demands. In addition, they are bound to take place in cases of mergers and acquisitions. It is therefore, important to understand and resolve the legal intricacies involved. In the light of the problems posed by laws governing the on-orbit transfer of satellites, especially laws at the international level, it is imperative to ponder whether the existing legal regime needs

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[1] The sub-orbital vehicle will carry passengers for consideration in 2013 or 2014 depending on the tests.
[2] Nicolas Mateesco Matte, *From Scientific Exploration to Commercial Utilization* (Toronto, Paris; The Carswell Company, Editions A. Pedone, 1977) at 1 [Matte, *Scientific Exploration*]
[3] *See* K. Tatsuzawa, "The Regulation of Commercial Space Activities by the Non-Governmental Entities in Space Law", in *Proceedings of the Thirty-first Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1988) 341 at 341 (commercialisation means profit-making transfer of goods and services and privatisation means transition of government owned activities to purely private initiative).
[4] Kai-Uwe Schrogl & Niklas Hedman, "The U.N. General Assembly Resolution 62/101 Of 17 December 2007 On "Recommendations On Enhancing The Practice Of States And International Intergovernmental Organizations In Registering Space Objects"" (2008) 34:1 J Space L 141 at 147.

to be modified. The matter has, in fact, has gained importance in the last few years and has been discussed in various international forums. [5]

To understand the complications raised by the current legal framework of international space law, it is pertinent to look at the circumstances in which the space treaties were drafted. Ever since science made it possible for man to explore outer space, it was realized that there was a need for laws to regulate space activities, so that the activities do not cause damage to or destroy Earth and so that all States can peacefully use and explore outer space. Right after Sputnik's launch, the United Nations General Assembly established an ad hoc Committee on the Peaceful Uses of Outer Space[6] in 1958, which became a permanent body in 1959.[7] The mandate of Committee on the Peaceful Uses of Outer Space (COPUOS) was :

> to review, as appropriate, the area of international co-operation, and to study practical and feasible means for giving effect to programs in the peaceful uses of outer space which could appropriately be undertaken under United Nations auspices....[and] to study the nature of legal problems which may arise from the exploration of outer space.[8]

The COPUOS has two subcommittees: the Scientific and Technical Subcommittee and the Legal Subcommittee (LSC). The COPUOS LSC is the primary forum for discussion and negotiation of international agreements governing the outer space. In 1961, COPUOS submitted a report based on which the United Nations General Assembly passed

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[5] *See eg, Report of the Chair of the Working Group on the Status and Application of the Five United Nations Treaties on Outer Space*, UNGAOR, 2013, Annex I, UN Doc A/AC.105/1045 at 31; *Report of the Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space on the work conducted under its multi-year workplan*, UNGAOR, 2012, UN Doc A/AC.105/C.2/101 at 8; "Conclusions of Project 2001 Plus: 'Current Issues in the Registration of Space Objects' Workshop" (delivered in Berlin, 20-21 January 2005), online:https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CDAQFjAB&url=http%3A%2F%2Fwww.uni-koeln.de%2Fjur-fak%2Finstluft%2Fprojectplus%2Fworkshop05%2F011.ppt&ei=uCD0Uab-Hc_A4APRvIC4BA&usg=AFQjCNE1pc1SAr19soHCvntTmg_NQQcjhw&sig2=Lnfj22qibgkhmnUYNf70rQ.

[6] *Question of the Peaceful Use of Outer Space,* GA Res 1348 (XIII), UNGAOR, 13th Sess, Supp No 18, UN Doc A/4090 (1958) 5.

[7] *International co-operation in the peaceful uses of outer space*, GA Res 1472, UNGAOR, 14th Sess, Supp No 16, UN Doc A/4354 (1959) 5 [UNGA Res 1472].

[8] *Ibid*

Resolution 1721(XVI),[9] which recognizes that general international law applies to outer space, and that outer space is free for exploration and use by all States and not subject to national appropriation. In 1963, the UN General Assembly adopted the Declaration of Legal Principles Governing Activities of States in the Exploration and Use of Outer Space,[10] which laid down the basic principles governing outer space and included in it the two principles recognized in the Resolution 1721(XVI). In 1967, COPUOS reached a consensus about the text of Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,[11] also called the *Magna Carta* of outer space law. The treaty embodies the principles of the Declaration of Legal Principles. This was the first general treaty adopted for governing outer space. By then, other than the superpowers, the United States and Soviet Union, only France had joined the club of space-faring nations by launching Asterix in 1965. In the span of next seven years, three other treaties were adopted and entered into force:

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

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

c)the Convention on Registration of Objects Launched into Outer Space.[14]

These three treaties, along with the Outer Space Treaty, form the basic framework for international space law, supplemented by UN Resolutions and Declarations. A few years later, in 1979, the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies[15] entered into force but it has not got wide acceptance.[16] In addition to

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[9] *International co-operation in the peaceful uses of outer space,* GA Res 1721, UNGAOR,16th Sess, Supp No 17, UN Doc A/5100, (1962) 6 [UN GA Res 1721]

[10] *Declaration of Legal Principles Governing Activities of States in the Exploration and Use of Outer Space*, GA Res 1962, UNGAOR, 18th Sess, Supp No 15, UN Doc A/5515 (1963) 15 [*Declaration of Legal Principles*].

[11] *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,* 27 January 1967, 18 UST 2410, 6 ILM 386 (entered into force 10 October, 1967) [*Outer Space Treaty*].

[12] *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched Into Outer Space,* 22 April, 1968, 19 USR 7570, 672 UNTS 119 [*Rescue Agreement*].

[13] *Convention on International Liability for Damage Caused by Space Objects* 29 March 1972, 961 UNTS 187, 24 UST 2389 (entered into force 1st September 1972) [*Liability Convention*].

[14] *Convention on Registration of Objects Launched into Outer Space*, 12 November 1974, 28 UST 695, 1023 UNTS 15 [*Registration Convention*].

[15] *Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, 18 December, 1979, 1363 UNTS 3, 18 ILM 1434. [*Moon Agreement*].

these abovementioned sources, the laws of the International Telecommunication Union (ITU), mainly set out in the Constitution of the International Telecommunication Union,[17] the Convention of the International Telecommunication Union[18] and the ITU Administrative Regulations,[19] govern outer space activities. The Administrative Regulations, which are binding on all ITU Member States,[20] are: the International Telecommunication Regulations; and the Radio Regulations.[21]

Having been formulated decades ago, the drafters of space law treaties could not have contemplated the present degree of commercialization and, consequently, on-orbit satellite transfers.[22] Naturally, the existing framework does not address said transfers specifically and even has provisions which pose legal obstacles. This situation calls for a solution, preferably within the framework, or an amendment to it, if necessary.

This thesis consists of five chapters. Chapter I deals with on-orbit satellite transfers in the commercial era, their importance, feasibility and kinds. Practical examples of on-orbit transfers have been cited. For instance, when the sovereignty of Hong Kong was transferred from the UK to China, some satellites operated from Hong Kong were also transferred to China. After privatization of intergovernmental entity INMARSAT, eight satellites of INMARSAT were transferred to the UK. Also, a Swedish entity purchased a satellite (BSB-1A) on-orbit from the UK. Thus, on-orbit transfer of satellites can occur due to various reasons. These transfers have given rise to several questions specially with respect to liability and registration. Chapter II elaborates on the complications of international liability and responsibility that arise in these transfers.

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[16] At present, the Moon Agreement has only 15 parties and 4 signatories.
[17] *Constitution of the International Telecommunication Union* , 22 December 1992, [1994] ATS 28, 1996 BTS 24, (entered into force 1 July 1994) [ITU Constitution].
[18] *Convention of the International Telecommunication Union*, 22nd December 1992, 1825 UNTS 390, 1996 UKTS 24 (entered into force 1 July 1994).
[19] *ITU Constitution, supra* note 17 , Article 4.1.
[20] *ITU Constitution*, *supra* note 17, Article 54.1.
[21] *Radio Regulations* (lTU:Geneva,1990); See *ITU Constitution*, *supra* note 17, Article 54.1.
[22] *Report of the Chairman of the Working Group on agenda item 9, "Review of the concept of the 'launching State,'"* UNGAOR, Annex II, UN Doc A/AC.105/763 (2001) at para 22 [*Report of the Chairman*]; Michael Chatzipanagiotis, "Registration of Space Objects and Transfer of Ownership in Orbit", (2007) ZLW 229 at 236; Armel Kerrest, "Remarks on the Responsibility and Liability for Damages Caused by Private Activity in Outer Space" in *Proceedings of the Fortieth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1997) 134 at 134, 135 [Kerrest, "Remarks"].

Launching State is defined in space law in such a way that once a launching State, always a launching State and only the launching State(s) is liable to pay compensation for damage by a satellite. A plain reading of the space treaties indicates that if the new transferee State is a non-launching State, it will not be liable for any damage caused by the satellite. This is despite the fact that the transferee probably has actual control over the satellites. The transferor, on other hand, being a launching State, continues to be liable for damage by a satellite over which it has no actual control. Chapter III deals with the (non)registration of the transferred satellites by a transferee and its implications. Under the existing system, only a launching State can be the State of registry of a satellite and this State exercises *de jure* 'jurisdiction and control' over it . Hence, if the transferee State is not a launching State, it also cannot become the State of registry and cannot have *de jure* jurisdiction and control, although it has *de facto* jurisdiction and control. Chapter IV briefly touches upon other legal concerns with regards to on-orbit satellite transfers. One such issue is return of space objects found to the State of registry (under Outer Space Treaty) or the launching authority (under Rescue Agreement). The situation is tricky as after on-orbit satellite transfer, the actual interest in satellite lies with the transferee State which may not be either the State of registry or the launching authority. Also, transferee State is not subject to duties of the launching authority or the State of registry for return of satellites found whereas transferor State is bound to perform such duties, despite not having any interest in the satellite. Another issue is restrictions posed by national laws, such as export control laws and foreign investment restrictions. These barriers restrict trade in satellites. Therefore, entities incorporated in States with liberal laws are benefitted. Chapter V suggests possible solutions to address this problem, their pros, cons and feasibility under the present political climate. The solutions discussed are: amendment to the space treaties; extensive interpretation of existing treaties; private arrangements between transferor and transferee entities; unilateral declaration by transferee State accepting liability; and bilateral agreements between State Parties by which the new transferee indemnifies the transferor State for any compensation the latter has to pay for being launching State. Finally, to conclude, the thesis looks at the best possible solutions to the problems for a way forward.

It is relevant to mention here that in on-orbit transfers, the issue of radiofrequencies and orbital positions is an important factor. Radiofrequency assignments and associated orbital positions have to be registered with ITU by a State if:

a) the State desires international protection against harmful interference;

b) the assignment is used for international service or

c) if it is believed that use of new assignment will cause harmful interference.[23]

On-orbit transfer of a satellite does not automatically transfer the ITU registration of frequency assignment and orbital position to transferee State. The transferee State has go through ITU procedures for such registration.[24] However, this aspect will not be dealt with in the thesis. The thesis mainly deals with legal problems that arise under international space law treaties, in cases of on-orbit satellite transfer.

It may also be relevant to note that satellite transfers may be between entities within a State or between different States. In cases where transfers are made within a State, national laws govern. Such cases are beyond the scope of this thesis. To discuss this, an extensive study on national laws is required. The thesis deals only with on-orbit satellite transfers between entities in different States.

The thesis mainly focuses on the issues of liability and responsibility of States after inter-State on-orbit satellite transfers. Since private entities are not subjects of international law, most references to transferee and transferor will be to their respective States.[25]

[23] Ram S. Jakhu, "International Regulation Of Telecommunications By Satellite: Procedures For Obtaining Radio Frequencies And Satellite Slots Through The ITU" (Lecture delivered at the Institute of Air and Space Law, McGill University, January 2013) [unpublished].

[24] A reference may be drawn to Pakistan which leased a satellite, so that it did not permanently lose its spot in Geosynchronous orbit obtained through ITU procedure.

[25] Kerrest, "Remarks", *supra* note 22 at 138.

I. ON-ORBIT TRANSFER IN COMMERCIAL ERA

Commercialization of space began within five years from the launch of Sputnik I. On July 10, 1962, Telstar, an experimental telecommunications satellite was launched for the American Telephone and Telegraph Company, the first private company to carry out activities in outer space. In the same year, COMSAT, a private corporation founded to plan, initiate, own, construct, manage, operate a commercial communication satellite system and work in cooperative basis with other nations, was established by an Act of the USA Congress.[26]

The Outer Space Treaty states that outer space should be free for use and exploration, and that such use and exploration should be "for the benefit and in the interests of all countries."[27] The provision cannot be interpreted as a ban on commercial use of outer space, and in fact, the word 'use' itself implies commercial exploitation.[28] The space treaties, in general, do not explicitly permit commercial space activities.[29] According to the well-known judgment of the Permanent Court of International Justice (PCIJ) in the *Lotus Case,* however, any activity that is not expressly prohibited in international law is permitted. Hence, as commercial space activities are not prohibited, they are considered lawful.[30]

Commercialisation of outer space, besides complicating existing problems, has given rise to new legal issues in space law, one of them being on-orbit transfer of satellites.[31]

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[26] *Communications Satellite Act* , l962, Pub.L. 87-624, 87th Congo; 47 U.S.C. §701 (1976) (USA).
[27] *Outer Space Treaty*, *supra* note 11, Article I.
[28] K.H. Bocksteigel, "Legal Implications of Space Activities" in *Proceedings of the Twenty-Fourth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1981) 1 at 6.
[29] See generally P.D. Nesgos. "International and Domestic Law Applicable to Commercial Launch Vehicle Transportation" in *Proceedings of the Twenty-Seventh Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1984) 98.
[30] See *Lotus Case (France v. Turkey)* (1927) PCIJ (Ser A) No 9 at 18.
[31] See M. Trögeler, "Practice of States and international organizations in registering the transfer of ownership of space objects" (Paper delivered at the IISL/ECSL Symposium on "Transfer of ownership of space objects: issues of responsibility, liability and registration", 19 March 2012), UNCOPUOS LSC, 51st Sess, 840th Mtg. (2012) at 6.

A. Kinds of On-orbit Satellite Transfers

On-orbit satellite transfers are generally sale, leasing of operation and control and possession by secured creditor on default. On-orbit satellite transfer means transfer of title and ownership or transfer of operation and control of functional on-orbit satellites, such as a lease or any other transfer of possession, which gives the transferee the right to operate and exercise control over the satellites.[32]

Transfer of operation and control of a satellite means that the operator, who is authorized under Article VI(2) of Outer Space Treaty to carry out a space activity, transfers the satellite to another entity who continues to carry out the space activity.[33] The normal means of delivering satellites is to hand over its control from the telemetry, tracking and control (TT&C) facility to the transferee.[34] The code for control is released to the transferee, who uses the code to put the satellite under its control and then changes the code, so that the transferor is not able to have access to the satellite any more.[35]

1. Sale

Full definition of space object has not been given in any of the space treaties. An identical partial definition of the term is found in the Liability Convention[36] and the Registration Convention,[37] which provide that space objects include "component parts of a space object as well as its launch vehicle and parts thereof."[38] Jurists have defined the term as objects into earth orbit and beyond,[39] originating from the earth.[40] Clearly, satellites, which orbit the earth from the outer space, are space objects.

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[32] Michael Gerhard, "Transfer of Operation and Control with Respect to Space Objects - Problems of Responsibility and Liability of States" (2002) 51 ZLW 571 at 571.
[33] *Ibid* at 572.
[34] Souichirou Kozuka, "Private Law Rules for the Commercial Activities in Space: Lex Ferenda" in *Proceedings of the Forty-eighth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2005) 300 at 301-302.
[35] *Ibid* at 301-302.
[36] *Liability Convention*, *supra* note 13, Article I (d)
[37] *Registration Convention, supra* note 14, Article I (b).
[38] *Liability Convention*, *supra* note 13, Article I (d)
[39] Bin Cheng, "Space Objects', 'Astronauts' and Related Expressions" in *Proceedings of the Thirty-Fourth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1991) 17 at 17; V. Kopal, "Some Remarks on Issues Relating to Legal Definitions of 'Space

Satellites are seldom off the shelf items and are built according to rigid standards to meet the purpose for which they are to be placed on orbit. In addition, the orbit, radiofrequencies, desired life of satellites and the launch vehicle too affect the design of a satellite.

Generally, satellites are purchased in the pre-construction stage. The operator of a satellite purchases it from a manufacturer by entering into a satellite procurement contract, which encompasses both the purchase and construction of satellites.[41] Under the contract, the manufacturer provides all labor, materials, facilities, data and program management. The manufacturer also offers services necessary to design, develop, manufacture, assemble, integrate, test and deliver the satellite. Thus, the contract may require not only product delivery but also certain services, which range from providing spare parts for auxiliary items, which can be easily damaged, to supporting launch.[42] Then, the operator finds an appropriate satellite launch-service provider for the specifications of his satellite.[43] The latter delivers the satellite in the orbit.

The operator may also enter into a delivery-in-orbit arrangement with the manufacturer. The manufacturer agrees to arrange the launch of the satellite in proper orbit, by entering into a launch-service contract with a launch provider on behalf of operator, in addition to entering into a satellite-procurement contract with operator.[44] The launch-service contract accords with the terms of the satellite-procurement contract. The

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Object', 'Space Debris' and 'Astronaut'" in *Proceedings of the Thirty-Seventh Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1994) 99 at 100, 101.

[40] See Stephen Gorove, "Cosmos 954: Issues of Law and Policy," (1978) 6:2 J Space L 137 at 141 [Gorove, "Cosmos 954"].

[41] Julianne Sang-Eun, "Commercial Space Contracts: Risk Management Clauses in Satellite Procurement Contracts" in Ram Jakhu, *Course pack: Government Regulation of space Activities: Documents and Materials*, vol II (Institute of Air and Space Law, McGill University, 2013) at 757; SAT International <http://www.jsati.com/why-satellite-who-Satellitemanufactuers.asp>.

[42] R. Bender, *Launching and Operating Satellites: Legal Issues* (The Hague: Martinus Nijhoff Publishers, 1998) at 94.[Bender, *Launching*].

[43] S.White, S.Bate & T. Johnson, *Satellite Communications in Europe: Law and Regulation* (London: FT Law & Tax, 1996) at 358; Peter D. Nesgos, "Legal Issues in Structuring Satellite Projects" (Lecture delivered at the Institute of Air and Space Law, McGill University , Montreal, 28 March 2013) [Nesgos, "Legal Issues"].

[44] See *Review of the concept of the "launching State": Report of the Secretariat*, UNGAOR, 2002, UN Doc A/AC.105/768 at 17 [*Launching State: Secretariat Report*]; Sang-Eun, *supra* note 41 at 757-758.

manufacturer has the duty to ensure that the satellite is launched on orbit and functioning properly and it is generally after this, that the property in the satellite passes to operator.[45]

The manufactured satellite must meet the performance requirements, agreed upon such as telecommunication transponder capacity, fuel consumption and life expectancy.[46] It takes at least two to three years to manufacture a satellite, and sufficient time should be allowed to test and repair, if necessary. The contract specifies when the risk of loss and title passes.[47] In most cases, the operator, the satellite manufacturer and the launcher are separate entities. Hence, the operator has to enter into a series of contracts, before having a performing satellite on orbit.

One of the reasons for entering into contracts in pre-construction and pre-launch stages is that a particular orbital position is often closely linked with the functioning and commercial value of satellite. It is expensive and, generally, commercially non-viable to re-locate a satellite. Also, payloads of satellites are custom-made to serve a particular purpose and may be efficient in performing only those functions.

Purchase and sale of operational satellites after they have been launched on-orbit are slowly becoming popular. In such a transaction, the buyer purchases an already operational satellite, which is on orbit, and which meets buyer's requirements. It is important to note here that on-orbit sale of satellites must not be confused with delivery-in-orbit arrangements.

2. Lease

Other than sale, entities can enter into contracts for transfer of a lesser degree of operation of satellite and control of lesser degree, such as, lease Leasing of satellites, which are already on orbit, provides an affordable and attractive opportunity for smaller entities, who have less deep pocket. A lease is a contract by which a rightful possessor of property (real and personal) conveys the right to use and occupy the property in exchange

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[45] *Ibid.*
[46] Bender, *Launching, supra* note 42 at 94.
[47] See generally, Pamela L. Meredith, " Risk allocation Provisions in Commercial Launch Contracts" in *Proceedings of the Thirty-Fourth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1991) 264 at 266.

for consideration, usually rent[48] or other periodical compensation for a specified period. The right of lessee is proprietary in nature.[49] Unlike a sale, a lease is granted only for a 'specified time', and after such time expires, the property automatically returns to the real owner. Although in a lease, the lessor gets a large and comprehensive measure of control over the property (i.e. to use, enjoy and have possession over it), such proprietary rights are generally for a particular period, for payment of an particular amount in order to enjoy such rights, and the title remains with the owner, who gets the property back at the end of period of lease. One such example is lease of the Astra-1B satellite, owned by the Luxembourg based company SES, to Nordic Satellite AB. Swiss Space Corporation operated the satellite on a contract for NSAB.[50] Another example is Pakistan's acquiring Hughes Global Systems Satellite, which was used by Turkey at that time, on lease for five years from December, 2001.[51]

3. Satellite as security interest

Asset-based financing is beneficial, as it enables the debtor to pay off debt through revenue generated from use of the asset. At the same time, it gives the creditor the right to go against the asset in case of default. If investors invest money in real or personal property within their State, they are protected by national laws which are enforced by domestic courts. Much of the financing in today's world, however, is international in nature. Creditors, however, may not be willing to invest large amounts of money internationally in space assets,[52] by having the space assets as security interests, unless they have confidence in the legal system of the borrower's State.

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[48] *Black's Law Dictionary,* 9th ed, *sub verbo* "lease".
[49] *The New Oxford Companion to* Law*,* 2008, *sub verbo,* leasehold estate.
[50] Gerhard, *supra* note 32 at 573.
[51] Nadeem Iqbal, "Pakistan Scrambles To Launch Satellite, Eyes Bigger Plans", *Space Daily* (2 August 2002) online: Space Daily <http://www.spacedaily.com/news/nuclear-india-pakistan-02za.html>; Pakistan Space and Upper Atmosphere Research Commission <http://www.suparco.gov.pk/pages/paksat1.asp>.
[52] Concept of space asset is broader than the concept of space object and it includes satellites. The definition of space assets includes all assets in space project like property that has been launched into outer space, manufactured in outer space and property that has returned from space. It also includes space assets on Earth intended for launch into outer space, intangible rights to control satellites, contractual rights, proceeds and revenues, debtor's rights to payments or performance under agreements associated with space assets like permits, licenses, authorisations et seq.

This has recently been addressed by creating a system of universal recognition and protection of international interests in space assets, the Protocol To The Convention On International Interests In Mobile Equipment On Matters Specific To Space Assets[53] seeks to address the concerns of creditors, due to inconsistencies of national laws on the financing of debts. The Space Assets Protocol was opened for signature on 9th March, 2012 and needs 10 ratifications or accessions to enter into force. This is the first international private law agreement in the realm of commercial space activities. It seeks to establish an optional international regime for facilitating asset-based satellite financing and promote private space activities.[54]

The Space Assets Protocol established a unified and predictable legal framework of registration and priority system for transnational financing of space assets.[55] is intended to do the following: to facilitate privatisation and commercialisation of outer space; to protect private interests in outer space; to bring order to establish greater certainty in enforceability of default remedies to encourage space financing; to create and protect by treaty a "publicly accessible registry of security interest in high value space assets."[56]

The Space Assets Protocol is a Protocol to the Cape Town Convention on International Interests in Mobile Equipments 2001[57] which provides a generic framework for registration of ownership and security interests and for legal remedies in cases of default. The Protocols to the Convention (for aircraft, rail and space) are specially designed to suit the needs of the individual modes.[58] The Aircraft Equipment Protocol has proved to be very successful and has significantly helped in the growth of aviation industry. It was contemplated that the Cape Town Convention can achieve the same

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[53] *Protocol To The Convention On International Interests In Mobile Equipment On Matters Specific To Space Assets*, 9 March 2012, UNIDROIT DCME-SP Doc 43 [*Space Assets Protocol*].
[54] *Report of the Legal Subcommittee on its fifty-first session*, UNGAOR (2012) UN Doc A/AC.105/1003 at 18, para 110 [*Report of LSC on its fifty-first session*].
[55] *Ibid* at 19, para 112
[56] Paul B. Larsen, "The Draft Space Protocol and Jurisdiction over commercial space assets" in *Proceedings of International Institute of Space Law* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2011) 485 at 485, 486 [Larsen, "Draft"].
[57] Convention on International Interests in Mobile Equipment, 16 November 2001, 2307 U.N.T.S. 285; UN Doc. No. A/AC.105/C.2/2002/CRP.3 (2001) [*Cape Town Convention*].
[58] Paul B. Larsen, "Brief Report On The Final Space Protocol", *International Institute of Space Law,* online < http://www.iislweb.org/docs/2012_unidroit.pdf>.

benefits for the space industry, specifically for smaller operators and start-up companies.[59] However, certain governments and industry people strongly opposed the adoption of the text of the Space Assets Protocol, because according to them the Space Assets Protocol cannot achieve the benefits space finance sector, the way the Aircraft Equipment Protocol benefitted the airline industry. [60]

The Space Assets Protocol provides a mechanism by which the financial investments of space industry creditors can be secured by a security agreement. Such creditors may take possession and control of the space assets[61] by self-help or court order in the event of default. Once the Space Assets Protocol is ratified, it will supersede domestic laws for States Parties, when security interests are executed by entities in different States. It presumes that space assets (including satellites) are easily transferable, as otherwise creditors cannot exercise default remedies.[62]

B. Circumstances under which on-orbit satellite transfers are possible

Undeniably, on-orbit transfer of satellites is possible in certain circumstances only. These include when the successor intends to provide same services, such as telecommunications, as the previous operator, or when the successor intends to use the same orbital position and frequencies for other services.[63] Use of an orbital position is limited by the specific geographic footprint of the satellite.[64] The new operator may, of course, move the satellite to a different orbital position which is expensive and fuel-

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[59] See generally, M.J. Stanford, "Transfer of possession and control under the Protocol to the Convention on International Interests in Mobile Equipment on Matters specific to Space Assets", (Paper delivered at the IISL/ECSL Symposium on "Transfer of ownership of space objects: issues of responsibility, liability and registration", 19 March 2012), UNCOPUOS LSC, 51st Sess, 840th Mtg. (2012) at 10.

[60] *Ibid; Report of LSC on its fifty-first session*, *supra* note 54 at 19, para 113; Nick Hughes, "UNIDROIT Draft Space Assets Protocol", *Holman Fenwick Willan*, online <http://www.hfw.com/UNIDROIT-Draft-Space-Assets-Protocol> (this is because space assets are different from aircrafts. For example, space assets, unlike aircrafts, do not move from one legal jurisdiction to another, are mostly located in outer space, have shorter life span and are often designed for a specific application only).

[61] *Space Assets Protocol, supra* note 53, Articles18, 21.

[62] Armel Kerrest, "Legal aspects of transfer of ownership and transfer of activities" (Paper delivered at the IISL/ECSL Symposium on "Transfer of ownership of space objects: issues of responsibility, liability and registration", 19 March 2012, UNCOPUOS LSC, 51st Sess, 840th Mtg. (2012) at 2. [Kerrest, "Transfer"]

[63] Gerhard, *supra* note 32 at 572.

[64] *Ibid*

consuming.[65] Additionally, if the successor intends to provide services different from the former operator, he must bear in mind that the payload may have been built specifically for the original type of service.[66]

Furthermore, today mergers and acquisitions take place frequently, and on-orbit satellite transfers may happen, if the target company has satellites as assets.[67] There are two ways that this can be accomplished: a) the original company may find a prospective buyer and sell the entire business, including the assets, as a going concern to the seller; or (b) the original company may sell the assets and assign the contracts to the buyer and wind up the company.[68] The mode taken depends on various factors, such as liabilities of the transferor company and the tax regime of the country where the transferor company is incorporated.[69]

As pointed out earlier,[70] if satellites are used as security for investments, satellites may have to be transferred in case of default. Public-private partnerships or the outcome of bankruptcy proceedings can also result in the transfer of satellites between entities.[71] Privatisation of intergovernmental bodies [72] and transfer of sovereignty over a land/country[73] can also effectively result in an on-orbit transfer of satellites.

C. Leasing Transponders versus On-Orbit Transfer of satellite

In a case of sudden demand for satellite services, there are two available options: to lease transponders from another operator or to purchase/lease a satellite on-orbit. So, why will entities or States purchase or lease satellites instead of entering into transponder contracts?

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[65] *Ibid.*
[66] *Ibid*.
[67] Kerrest, "Transfer", *supra* note 62 at 2.
[68] Ricky J. Lee, "Effects of Satellite Ownership Transfers on the Liability of the Launching States" in *Proceedings of the Forty-third Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2000) 148 at 151 [Lee, "Effects"].
[69] *Ibid* at 152.
[70] Above Part I.A.3.
[71] Kay-Uwe Horl and Kamlesh Gungaphul, "Problems related to 'change of ownership' with respect to registration - The Industry View" (Paper delivered at the Project 2001 Plus Workshop "Current Issues in the Registration of Space Objects", Berlin, 20-21 January 2005).
[72] Below Part I. D.8.
[73] Below Part I. D.1.

Transponders are electronic devices built into satellites which receive, amplify and retransmit signals.[74] A satellite may have many transponders. One transponder may serve different clients and different services, such as voice, video and data, simultaneously. In transponder contracts, the customer purchases satellite capacity from a satellite operator.[75]Transponder lessees purchase a service closely matching their needs, and factors considered are services offered, service area, the manner in which the service is received by a customer, etc.[76] The customer or lessee of a transponder contract generally has the right over only specified transponders and is limited by the terms of the contract with the operator. Such lessees are typically involved in a particular service only, such as telecommunication, or have only a limited area of operation. They have no proprietary right over the satellite. Of course, such contracts are also entered into when there is a shortage of required indigenous transponders due to lack of time and money. Recently, Indian Space Research Organization (ISRO), India's space agency, the sole satellite operator and sole provider of transponder capacities in India, leased foreign transponders, as ISRO was not able to keep pace with the increasing demands for transponders from the Indian private broadcasting sector.[77] Brazil, too, leased transponders from INTELSAT before it could afford its own domestic satellite telecommunication system.[78]

Leasing transponders is akin to leasing office space in a skyscraper, whereas purchasing or leasing a satellite is like purchasing the skyscraper.[79] Thus, if an entity or State wishes to use a lot of transponders, it is better to own a satellite. One way of owning satellite is through on-orbit transfer.

Furthermore, an operator who is big enough to have satellites, particularly a fleet of satellites, will gain free cash-flow that will make it self-sufficient. As Tom Choi, CEO

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[74] Bender, *Launching, supra* note 42 at 102.
[75] White, Bate & Johnson, *supra* note 43 at 358.
[76] Bender, *Launching, supra* note 42 at 102.
[77] Madhumati D S, "Beam us up, Bangalore", *The Hindu*, (20 April 2013).
[78] Frans G. von der Dunk, "The Illogical Link: Launching, Liability and Leasing" in *Proceedings of the Thirty-sixth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1993) 349 at 349.[von der Dunk, "Illogical Link"].
[79] Greg Berlocher, "Satellite Manufacturing: A New Landscape", *Satellite Today* (1 September 2007) online: <http://www.satellitetoday.com/via/features/Satellite-Manufacturing-A-New-Landscape_18882.html>.

of Asia Broadcast Satellite (ABS) (China), a new entrant which has become one of the most impressive satellite operators, recounts:

> Hughes Electronics owned the commercial satellite operator Hughes Communications International (HCI) where I spent five years of my early career. It owned the Galaxy satellite fleet and it merged it with PanAmSat. I observed that HCI, with more than 20 satellites, generated over $500 million in free cash flow, which enabled the company to have a wide range of possibilities. They could build and launch a new satellite whenever they needed to organically grow, or they could use the funds to make strategic investments in new businesses such as DirecTV. It also gave them the freedom to develop new technologies such as the Spaceway, the world's first commercial HTS satellite...With my background in Hughes, I knew that if ABS was going to be successful in the long-term, we had to grow big enough to attain a critical mass of free cash flow.[80]

In addition, with the growing demand for satellite services, demand for transponders is also increasing. Therefore, gaining operation and control of a satellite by transfer, and then leasing the unused transponders, is profitable. After Pakistan leased a satellite from Hughes Global Communication System, the then Advisor to the science ministry of Pakistan said:

> (S)atellite's footprints fall on the commercially hot markets of India, Sri Lanka, Afghanistan, Africa and Europe. We can very easily recover the cost of the present satellite as Pakistan's current total use of transponder is not more than four. The remaining we can sell to other countries' telecommunication or broadcasting companies.[81]

D. State practice of on-orbit satellite transfer

This sub-chapter discusses some instances of on-orbit satellite transfer between States. These examples show that on-orbit satellite transfers have been happening and therefore, it is time to address the related unsolved legal questions. These legal questions, which arise because of such transfers, will be dealt with in detail in the subsequent chapters.

1. Between the UK and China

AsiaSat-1, AsiaSat-2, APSTAR-I and APSTAR-IA were all launched from Xichang, China. Launch of the Asiasat satellites were procured by Asia Satellites

[80] Interview of Tom Choi, CEO, Asia Broadcast Satellite by Mark Holmes (1 March 2013) in "Via Satellite's Satellite Executive of the Year 2012", *Via Satellite Magazine*, March 2013 at 20.
[81] Iqbal, *supra* note 51.

Telecommunications Co. Ltd (AST) which owned and operated them. Launch of the Apstar satellites were procured by APT Satellite Co. (APT) which owned and operated them. Both AST and APT were incorporated in Hong Kong, which was under the sovereignty of the UK at that time. On 1st July 1997, there was a transfer of the satellites- AsiaSat-1, AsiaSat-2, APSTAR-I and APSTAR-IA from UK to China. The situation arose due to the special circumstances involving the transfer of territory (Hong Kong) between the China and United Kingdom in 1997 and it was a part of the negotiations of returning Hong Kong to China.

2. Between the UK and Sweden

The BSB-1A satellite was launched from Cape Canaveral, USA in 1989. Its owner/operator was the British Satellite Broadcasting Ltd. (UK). The satellite was bought on-orbit by a Swedish entity in 1996. Incidentally, Sweden was not involved in the actual launch of the satellite.

3. NSS Satellites of the Netherlands

Two satellites, NSS6 and NSS7, were delivered-in-orbit on April 2002 and December 2002 to New Sky Satellites, incorporated in Netherlands. The satellites were made by the Lockheed Martin and launched from France. Furthermore, four on-orbit satellites were transferred to New Sky Satellites from the previous owner, INTELSAT.

4. Koreasat satellites purchased by ABS

Koreasat-2 of the South Korean KT Corporation was manufactured by Lockheed Martin and launched in January 1996 from Florida, USA. KT Corporation sold and provided TT&C of the satellite to Asia Broadcast Satellite (ABS), a satellite operator in China, which is not a launching State. On 2 July 2009, ABS announced the purchase of Koreasat-2, which was to be renamed as ABS-1A[82] but control remained with Korea.

[82] Setsuko Aoki, "Satellite Ownership Transfers and the Liability of the Launching States" (Paper delivered at the IISL/ECSL Symposium on "Transfer of ownership of space objects: issues of responsibility, liability and registration", 19 March 2012), UNCOPUOS LSC, 51st Sess, 840th Mtg. (2012) at 8. [Aoki "Satellite Ownership"].

Ten months later, on 24th May 2010, ABS bought on-orbit satellite Koreasat-3 from KT Corporation and renamed it ABS-7. Koreasat-3 was manufactured by Lockheed Martin and launched in September 1999 from Guiana Space Center of France. KT Corporation provided TT&C to ABS. Here too, the ownership passed to a company in China whereas control remained with Korea.

5. Telesat's Anik satellites to Argentina

In order to comply with ITU timelines, Argentine corporation Paracom S.A purchased Anik CI and Anik CII satellites from Telesat, a Canadian corporation. The two companies formed a joint venture - Paracomsat (Argentina) which was given the charge of operating the satellites. The satellites remained registered in Canada.[83] In 1997, the satellites were bought back by Telesat.[84]

6. ABS acquisition of LMSCV and LMI companies

Satellite LMI-1 was built by Lockheed Martin Commercial Space Systems of the USA and was launched on orbit on 27th September, 1999 by a Russian Proton carrier rocket[85] from the Baikonur launch site in Republic of Kazakhstan.[86] This launch was carried out under the auspices of International Launch Services (ILS).[87]

The satellite LMI-1 fulfils the satellite capacity requirements of Russian telecommunications and broadcasting companies and also satisfies the capacity requirements of telecommunication and broadcasting in Commonwealth of Independent States, Eastern and Central Europe, Asia and Africa. The owner/operator was Lockheed

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[83] *Note Verbale dated 6 February 1987 from the Permanent Mission of Canada to the United Nations addressed to the Secretary General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/156 (13 February, 1987).
[84] Donald H. Martin, *Communication Satellites* (El Segundo, Calfornia: The Aerospace Press, 2000) 241.
[85] It is a common practice for the payload and the launch vehicle to be registered in different countries
[86] *Note verbale dated 10 December 1999 from the Permanent Mission of the Russian Federation to the United Nations (Vienna) addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/367, (17 December 1999).
[87] International Launch Services, News Release, "Proton Rocket Successfully Launches LMI-1" (27 September 1999) online: International Launch Services <http://www.ilslaunch.com/newsroom/news-releases/proton-rocket-successfully-launches-lmi-1> (ILS is a joint venture stock company established in 1995 to jointly market Proton and the Lockheed Martin Astronautics-built Atlas to the worldwide satellite launch market. ILS is headquartered and incorporated in the USA.).

Martin Space and Communications Venture (LMSCV). Lockheed Martin Intersputnik (LMI)[88] had the exclusive right to market LMI-1. No State of Registry of the satellite has been found.

In September, 2006, ABS, the Chinese satellite operator, acquired LMSCV and LMI from Lockheed Martin Global Telecommunications and the acquired companies were renamed Asia Broadcast Satellite Holdings and Asia Broadcast Satellite, respectively. Thus, this is a case where the transfer of satellite has happened due to acquisition of a company.

7. Between China and Philippines

Agila-2, made by Space Systems/Loral, was launched in 1997 from China. It was owned/operated by Mabhay Satellite Corporation (MSC), a company in Philippines, which was acquired by ABS, China in 2009. The acquisition of MSC also brought ownership of satellite Agila-2 to ABS, which was renamed ABS-5.

8. The UK on Inmarsat Satellites

Inmarsat (earlier INMARSAT) used to be an inter-governmental organisation which was later privatised and incorporated in the UK. Hence, a British entity became the new owner of 8 satellite of erstwhile INMARSAT. This is a case of transfer of ownership of satellite due to change of the legal status of an entity.

9. SingTel-Optus Case

In March 2013, Singapore Telecommunications Ltd (SingTel), one of Southeast Asia's largest telecom companies, initiated a strategic review of its satellite business and was interested to sell the satellite business of its Australian unit Optus, seeking about $2 billion.[89] SingTel was looking to sell the satellite division to realign their business and

[88] Lockheed Martin Intersputnik (LMI) was formed in 1997 as a joint venture of Lockheed Martin and Intersputnik International Organization of Space Communications. LMI's objective was to develop a multi-satellite system, providing a variety of communication and broadcasting services.
[89] Veronica Magan, "SingTel Seeks to Sell Optus Satellite for $2 Billion: KKR and Carlyle Group among suitors", *Satellite Today* (30 May 2013); Gaurav Raghuvanshi, Gillian Tan & Cynthia Koons, "SingTel

invest in other acquisitions that the company has planned. Optus Satellite has five satellites on orbit providing television, radio, phone, data and military services to Australia, New Zealand, and parts of the Antarctic and is expected to launch a sixth satellite this year.[90]

If the deal took place, it might have caused the satellites to be transferred to another company, incorporated in another State. However, at present, the sale of the Optus satellite business has been cancelled,[91] probably because the bids lodged for the satellite business was lower than expected.[92]

10. Between Telesat, Canada and APT, China

The lease arrangement between APT, a Hong-Kong based operator, and Telesat on Telstar satellite was a decade old.[93] It was first executed with Loral Skynet and then, with Telesat after Loral and Telesat merged in 2007. In 2009, Telesat, a satellite operator in Canada, transferred its leasehold interests in Telstar satellite, along with the customer contracts to APT.[94] This deal gave APT full commercial control of the satellite which is also known as Apstar 2R. The reasons for the deal was that APT had been already operating the satellite for a long time; there was upcoming requirement to replace the satellite; and a complex regulatory environment existed surrounding the satellite.[95]

Looks at Sale: Telecom Puts Its Australian Satellite Business Under Review", *Wall Street Journal*, (18 March 2013); SingTel, News Release, "SingTel conducts strategic review of Optus satellite business" (18 March 2013) [SingTel, "Strategic"].

[90] SingTel, "Strategic" *supra* note 89.

[91] SingTel, Media Statement, "Conclusion of Strategic Review of Optus Satellite Business" (13 August 2013),online <http://www.asx.com.au/asxpdf/20130814/pdf/42hn7bt61cfhsy.pdf>.

[92] Ry Crozier, "SingTel cancels sale of Optus satellite business", *itnews* (14 August 2013), online <http://www.itnews.com.au/News/353373,singtel-cancels-sale-of-optus-satellite-business.aspx>.

[93] "Telesat completes US$69M transfer of Telstar 10 back to operator", *Ottawa Business Journal* (9 July 2009) ["Telesat completes US$69M"]

[94] *Ibid*; Telesat, Press Release, "Telesat Completes Transfer Of Its Interests In Telstar 10/Apstar 2R Back To APT Satellite Company" (9 July 2009).

[95] "Telesat completes US$69M", *supra* note 93.

E. Importance of on-orbit satellite transfer

On-orbit satellite transfers have certain distinct advantages. Only a few States have developed the technology and facilities to launch and manufacture satellites,[96] whereas every State needs access to services offered by satellites. In addition, satellite industry is a profitable one. According to reports sponsored by the Satellite Industry Association (SIA), global satellite industry revenues have nearly tripled since 2001, with an average 10% growth per year.[97] As an example of yearly growths, the industry saw a growth of 11% in 2009, 5% in 2010,[98] 6% in 2011 and 7% in 2012.[99] These two abovementioned factors indicate that there are many entities willing to enter into the satellite operating business. It is prudent for new entrants to purchase or lease satellites which have been already launched and are functional. It saves a lot of legal and logistical hassle. The buyers do not need to acquire launch licenses and do not need to comply with other legal requirements necessary for launch under national laws. Furthermore, the buyers do not need to wait for operation till launch is accomplished, do not need to enter into multiple contracts like satellite procurement and launch services contracts, and can

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[96] Berlocher, *supra* note 79 (the satellite manufacturing market is dominated by six major manufacturers - Boeing Satellite Systems, Lockheed Martin, Orbital Sciences, and Space Systems/Loral in the USA and Thales Alenia Space and EADS Astrium in Europe, each focusing on a particular niche area of the market); The Tauri Group, sponsored by Satellite Industry Association, *State of the Satellite Industry Report* (June 2013) at 16, 17, 23, online <http://www.sia.org/wp-content/uploads/2013/06/2013_SSIR_Final.pdf > (in 2012, the USA's market share approached 60% of the global revenues in satellite manufacturing. Other countries involved in manufacturing were European nations, Russia, China, Japan, India and a few others. Out of the 25 commercial payloads ordered to be launched in 2012, 8 were won by the USA, 11 by Europe, 2 by Russia, 2 by China, 1 by India and one by Multi-national ventures.); The Futron Corporation, sponsored by Satellite Industry Association, *State of the Satellite Industry Report* (May 2012) at 20, online: http://www.sia.org/wp-content/uploads/2012/05/FINAL-2012-State-of-Satellite-Industry-Report-20120522.pdf (commercial launch orders announced in 2011 was 30. USA launch providers received 3 of these orders or a 10% share, European launch providers received 14 of these orders or 47%, Russian launch providers received 8 of these orders or 27% and remaining 5 orders were split between the China Great Wall Industry Corporation and the multinational firm Sea Launch); Office of Commercial Transportation, FAA, *Commercial Space Transportation: 2012 Year in review* (January 2013) at 4 (according to the FAA, in 2012, the USA, Russia, Europe, China, Japan, India, Iran, North Korea and Sea Launch, one multi-national provider, conducted 78 launches, 20 of which were commercial).

[97] The Tauri Group, *supra* note 96 at 9.

[98] The Futron Corporation, sponsored by Satellite Industry Association, *State of the Satellite Industry Report* (June 2011) at 6, online <http://www.sia.org/wp-content/uploads/2011/06/2011-State-of-Satellite-Industry-Report-June-2011.pdf>.

[99] The Tauri Group, *supra* note 96 at 6, 8 (also in 2012, satellite industry revenue was $189.5 billion. Satellite industry accounted for 62% of space revenues. Looking at the segments of satellite industry individually, satellite services, the largest segment, grew by 5% ,satellite manufacturing revenues grew by 23%, launch industry revenues rose by 35% and ground equipment by 4% in 2012.).

avoid the risk of launch failure. Similar advantages ensue in the case of lease or other kinds of transfer of operation and control.

For existing operators too, on orbit satellite transfer helps in dealing with sudden demand for satellite services.[100] Pre-construction arrangement takes 2-3 years to fructify[101] and then, it may be found that the launch vehicle, which is scheduled for the launch, has had recent failures. This may necessitate a search for another launch vehicle, but the existing launch vehicles may be too far booked in the future, which will delay the launch of satellite.[102] In addition, there is always a probability of failure of launch. Recently, ISRO, the sole satellite operator, launcher and manufacturer in India, lost two communications satellites (GSAT-4 and GSAT-5P), while launching them on its GSLV test vehicle. ISRO also lost half of INSAR-4B, which got crippled while on orbit, causing a set-back of 50 transponders. Because of these incidents, ISRO was unable to meet the local demand of private broadcasters and was contemplating on-orbit purchase of satellites, which ultimately did not materialize, as satellites with appropriate footprints were not available.[103] These and other contingencies often arise in the case of pre-construction contracts.

Practice of on-orbit satellite transfers will bring in fungibility, which, according to the author, will definitely attract more capital and will be a boon to the space sector. Furthermore, often more than one satellite is required for carrying out satellite services, such as telecommunications and remote-sensing, especially when a large area of the earth is to be covered. In the Geostationary orbit,[104] only three satellites are required to cover the whole globe. Hence, orbital slots of this orbit are high in demand, making it very congested. Additionally, in Low Earth Orbit, (LEO) constellations have been placed for making communication cheaper and better. In fact, 66 satellites of the Iridium constellation are in LEO. They have the computing capacity of all the geo-stationary satellites launched prior and have made it possible to communicate to any point in the

[100] See Horl & Gungaphul,*supra* note 71.
[101] See generally, Madhumati, *supra* note 77.
[102] Bender, *Launching, supra* note 42 at 94.
[103] Madhumati, *supra* note 77.
[104] The geostationary orbit (GEO) is approximately 35700 kilometers above the earth. A satellite in this orbit accomplishes revolution in the same speed as earth and has 24 hour visibility from a point in Earth.

world with mobile phone. When a number of satellites are required, the chances of launch failures and constructions delays increase. In these cases, it makes even more sense to go for on-orbit transfers.

Lastly, it is difficult to find financers for satellite operating ventures and to ascertain the market.[105] It is easier to arrange funds for purchasing the already existing satellites (especially if they are to be used for same purpose by the new company) and to obtain insurance, as the financiers and insurers are certain about the market and about profitability of the venture.[106] Iridium went bankrupt because it was unable to find enough subscribers.[107] In an on-orbit transfer of satellite, the new operator may even get already existing subscribers.

[105] W.B. Scott, "Multimedia Satcom Competition Intensifies", *Aviation Week and Space Technology*, (6 April 1998).
[106] Nesgos, "Legal Issues:, *supra* note 43.
[107] Craig Mellow, "The Rise and Fall and Rise of Iridium", Air & Space Magazine, <http://www.airspacemag.com/space-exploration/iridium.html>.

II. QUESTIONS OF RESPONSIBILITY AND LIABILITY IN ON-ORBIT SATELLITE TRANSFERS

"The scope of issues and factual considerations involved in the problem of allocating responsibility or liability to entities engaged in space activities is vast; perhaps as vast as the space itself."[108]-Dimitri Maniatis

It is important to ascertain the liability and responsibility of States after an on-orbit satellite transfer takes place. This is because damage caused by a satellite may amount to millions of dollars and can totally destroy a successful undertaking or put a significant financial burden on a State.

Space technology has become extraordinarily sophisticated and safer since 1945, when man's exploration of outer space began through rocket exploration.[109] But space activities still continue to be risky. Notwithstanding the precautionary measures taken by States and intergovernmental organizations, on occasion, damage may be caused by space objects.[110] There have been several such instances in history. On 5 September 1962, a metal object roughly weighing twenty pounds landed on a street in Manitowoc, Wisconsin, and according to calculations and observations, it was more than probable that the object was part of Sputnik IV, launched by Soviet Union in 1960.[111] Fortunately, no damage occurred on that occasion. On 5 June, 1969, a Japanese cargo boat off the coast of Siberia was damaged by fragments from a device launched into outer space, and five sailors were injured in the accident.[112] On 24 January 1978, Cosmos 954, a Soviet nuclear powered satellite began dropping from its orbit due to unexplained decompression. It finally broke up and was scattered over a sparsely populated area of northern Canada. The debris was radioactive and the recovery operation cost more than $6 million Canadian dollars.[113] As recently as in January 2013, debris from China's

[108] Dimitri Maniatis, "The Law Governing Liability for Damage Caused by Space Objects" (1997) 22:1 Ann Air & Sp L 370 at 372.
[109] See *Report of the UN Ad Hoc Committee on the Peaceful uses of Outer Space*, UNGAOR, 14th Sess, Annex, Agenda Item 25, UN Doc A/4141 (1959) at 11.
[110] *Liability Convention, supra* note 13, Preamble, para 3.
[111] COPUOSOR,2nd Sess, 15th Mtg, UN Doc A/AC.105/PV.15 (1963) at 33-34.
[112] LSCOR,8th Sess, 116th Mtg, UN Doc A/AC.105/C.2/SR.131 (1969) at 6.
[113] See generally *Canada: Claim Against The Union Of Soviet Socialist Republics For Damage Caused By Soviet Cosmos 954* (23 January 1979 and 15 March 1979)18 ILM 899 [*Canada: Claim*]; *Protocol in respect of the claim for damages caused by the satellite "Cosmos 954"*,(*Canada and the Union of Soviet Socialist Republics*) (1981), 1470 UNTS 270 [*Protocol Cosmos 954*].

destruction of its own satellite in 2007 collided with the Russian BLITS satellite, knocking it off its axis.[114] Now, the satellite knocked from original orientation and is now rendered useless.[115] In 2009, the Iridium 33 and Russian Kosmos 2251 communications satellites collided with each other, resulting in destruction of both the satellites.[116] Thus, there have been damage[117] to the surface of earth and space objects of other States due to space activities of States. Aircrafts in flight may also be damaged by space activities.

After an on-orbit satellite transfer takes place, ideally, the transferee should be held liable as well as responsible for the satellite and its operation. However, under existing international space law, that may not be the case always. This may lead to an unreasonable situation where the transferor is still liable for the satellite which it has already transferred and over which it has no control. The transferee, on the other hand, despite having actual control, is not liable. Similar views have been taken by States, such as the Netherlands for the satellites acquired by New Sky Satellites, and the UK for the Inmarsat satellites, which have been transferred to the UK after privatization of the INMARSAT. To understand the ambiguity and deficiency in the responsibility and liability regime with respect to on-orbit satellite transfers, it is important to first have a look at the present law governing responsibility and liability in outer space.

A. General International Law

To comprehensively understand a concept of space law, it is advisable to first look at it from general international law perspective. General international law has been applicable to outer space from the beginning,[118] and even now applies in cases not

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[114] Leonard David, "Russian Satellite Hit by Debris from Chinese Anti-Satellite Test", *SPACE.Com*, (8 March 2013), online: <http://www.space.com/20138-russian-satellite-chinese-space-junk.html>; Karl Tate, "Russian Satellite Crash with Chinese ASAT Debris Explained", *SPACE.Com* (8 March 2013) online <http://www.space.com/20145-russian-satellite-chinese-debris-crash-infographic.html>.

[115] *Ibid.*

[116] *See generally,* Frans G. von der Dunk, "Too-close Encounters of the Third Party Kind: Will the Liability Convention stand the test of the Cosmos 2251-Iridium 33 Collision" in *Proceedings of International Institute of Space Law* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2009) 199.

[117] See *Black's Law Dictionary*, 9th ed, *sub verbo* 'damage'(Damage essentially means loss or injury to person or property); *Liability Convention*, *supra* note 13, Article I (a).

[118] Bin Cheng, "The Commercial Development of Space: The need for New Treaties" (1991) 19:1 J Sp L 17 at 19; Paul G. Dembling, "Treaty on Principles Governing the Activities of States in the Exploration and

covered by space law, or when space law does not apply to States. Space law is after all a *lex specialis* of general international law from which it is derived "with an eye to the peculiarities of space."[119]

1. Concept of State Responsibility

The term 'Responsibility', derived from the Latin word *respondere* (to answer), means answerability of a subject for acts and omissions imputable to it; for the subject's being in conformity with applicable system of norms, whether moral, legal, religious, political or any other, as well as answerability for consequences of these acts and omissions, whatever they may be.[120] A person is answerable for authorship of his act or omission and its consequences. In the legal context, responsibility is a person's answerability with regards to compliance with legal norms establishing rights and duties and any breaches thereof.

State responsibility is a fundamental principle of international law. The general international law on state responsibility has been embodied in the Articles on Responsibility of States for Internationally Wrongful Acts.[121] Article 1 of the Articles on Responsibility reiterates the established principle[122] that an internationally wrongful act

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Use of Outer Space Including the Moon and Other Celestial Bodies" in Nandasiri Jasentuliyana and Roy S.K.Lee, eds, *Manual of Space Law* 1 at 12. (New York: Oceana Publications, Inc, 1979) [Dembling, "Treaty"]; Bin Cheng, *Studies in International Space Law* (Oxford: Clarendon Press, 1997) at 175 [Cheng, *Studies*].

[119] Frans G. von der Dunk, "Liability versus Responsibility in Space Law: Misconception or Misconstruction?" (in *Proceedings of the Thirty-fourth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1991) 363 at 363. [von der Dunk, "Liability"]; See also UN GA Res 1721, *supra* note 9.

[120]Cheng, *Studies, supra* note 118 at 603; Bin Cheng, "Article VI of The 1967 Space Treaty Revisited: 'International Responsibility', 'National Activities' and 'The Appropriate State'" (1998) 26:1 J Space L 7 at 9 [Cheng, "Article VI"]; A Decencière-Ferrandière, *La responsabilité internationale des États à raison des dommages subis par des étrangers* (Paris, Rousseau, 1925) 11 cited in Brigitte Stern, "The Elements of An Internationally Wrongful Act" in James Crawford, Alain Pellet & Simon Olleson, eds, *The Law of International Responsibility* (Oxford: Oxford University Press, 2010).

[121] *Articles on Responsibility of States for Internationally Wrongful Acts,* GA Res 56/83 and A/56/49(Vol. I)/Corr.4., UNGAOR (2001) ["Articles on Responsibility"]; See Ian Brownlie, *Principles of Public International Law,* (Oxford: Oxford University Press, 2008) at 446, 449.

[122] See *The Corfu Channel Case (United Kingdom of Great Britain and Northern Ireland v Albania)* Merits [1949] ICJ Rep 4 at 23 [*Corfu*]; *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v. United States of America)* Merits, [1986] ICJ Rep 14 at 142, 149 [*Nicaragua*]; *Phosphates in Morocco (Italy v. France)* (1938) PCIJ (Ser A/B) No 74 at 28 [*Phosphates in Morocco*]; *Case of the S.S. "Wimbledon" (United Kingdom, France, Italy & Japan v. Germany)* (1923) PCIJ (Ser A) No 1 at 30.

by a State entails State responsibility. Article 2 lays down the conditions required to prove that an act is an internationally wrongful act. It states that:

> There is an internationally wrongful act of a State when conduct consisting of an action or omission:
> (*a*) is attributable to the State under international law; and
> (*b*) constitutes a breach of an international obligation of the State.[123]

Conduct attributable to State may be an act and/or omission. Attribution may be 'subjective' or 'objective', depending on the circumstances, and a general rule regarding this has not been laid down in the Articles on Responsibility.[124] As to the attribution of a conduct to a State, the general rule is that the conduct of government organs,[125] even when such conduct is outside their authorities;[126] conduct by agents of the State who have acted under direction, guidance or control of government organs;[127] conduct of private persons for which a State has assumed responsibility[128] are all attributed to the State at the international level. Involvement of a State is essential for attribution.[129] Thus, a State is generally not held directly responsible for acts of its private parties. Direct responsibility means responsibility of a State for acts of the government, its officials, agents and others acting on behalf of State, whose acts are 'deemed' to be acts of the State.[130] However, even if a State is not directly responsible for acts of non-governmental actors, it still continues to be indirectly responsible for failing to take all reasonable measures for prevention of the act and for bringing to justice and taking proper steps against the person who has caused the damage.[131]

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[123] *Articles on Responsibility, supra* note 121, Article 2; See also *Case Concerning United States Diplomatic and Consular Staff in Tehran (United States of America v Iran),* [1980] ICJ Rep 3 at 29 [*Tehran*]; *Dickson Car Wheel Company (U.S.A.) v. United Mexican States* (1931) 4 UNRIAA 669 at 678 (American-Mexican Claims Commission); *Phosphates in Morocco*, supra note 122 at 28.
[124] "Draft Articles on Responsibility of states for internationally wrongful acts with commentaries" (UN Doc A/CN.4/SER.A/2001/Add.1) in *Yearbook of the International Law Commission 2001*, vol 2, part 2 (New York and Geneva: UN, 2007) at 34 ["Draft Articles Commentaries"].
[125] *Articles on Responsibility*, *supra* note 121, Article 5
[126] *Articles on Responsibility*, *supra* note 121, Article 7
[127] *Articles on Responsibility*, *supra* note 121, Article 8
[128] *Articles on Responsibility*, *supra* note 121, Article 11; Rudiger Wolfrum, "State Responsibility for Private Actors: An Old Problem of Renewed Relevance" in Maurizio Ragazzi, eds, *International Responsibility Today,* (Leiden, Boston: Martinus Nijhoff Publishers, 2005) 423 at 425.
[129] *Kenneth P. Yeager v. The Islamic Republic of Iran* (1987) 17 Iran-US CTR 92 at 101–102.
[130] *B. E. Chattin (United States.) v. United Mexican States* (1927) 4 UNRIAA 422 at 425-426, dissenting opinion by Mexican Commissioner.
[131] *Ibid* ; Wolfrum, *supra* note 128 at 424.

Sometimes, it is said that there has to be a third element, namely damage.[132] However, this is the old view.[133] Now, State responsibility ensues even in if the breach of an international obligation by State does not cause any damage/injury but, the extent and form of reparation will depend on the damage actually caused.[134]

2. Concepts of "Reparation for State Responsibility" & "Liability"

International law imposes on a responsible State the obligation to make full reparation for the harmful consequences, material or moral, of its internationally wrongful acts or omissions.[135] Breach of an engagement involves the obligation to make reparation to the victim by wiping out all of the consequences of an illegal act or omission and by re-establishing situation that would have existed had the illegal act or omission not been committed.[136] Judge Huber said, in a report on the *Spanish Zone of Morocco Claims,*[137] "Responsibility is the necessary corollary of a right. All rights of an international character involve international responsibility. If the obligation in question is not met, responsibility entails the duty to make reparation." Reparation is a consequence of responsibility and the duty to make reparation is a part of the broader concept of responsibility. Restitution, compensation and satisfaction, either singly or in combination, form full reparation.[138] However, restitution[139] is most closely related to the basic concept

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[132] *Draft Articles Commentaries*, *supra* note 124 at 36; Brigitte Stern, "The Elements of an Internationally Wrongful Act" in James Crawford, Alain Pellet & Simon Olleson, eds, *The Law of International Responsibility* (Oxford: Oxford University Press, 2010) 193 at 193.

[133] Alain Pellet, "The Definition of Responsibility in International Law" in James Crawford, Alain Pellet & Simon Olleson, eds, *The Law of International Responsibility* (Oxford: Oxford University Press, 2010) 3 at 8-10; Gilbert Guillaume, "Overview of Part One of the Articles on State Responsibility" in James Crawford, Alain Pellet & Simon Olleson, eds, *The Law of International Responsibility* (Oxford: Oxford University Press, 2010) 187 at 187.

[134] Brigitte Stern, "The Obligation to Make Reparation" in James Crawford, Alain Pellet & Simon Olleson, eds, *The Law of International Responsibility* (Oxford: Oxford University Press, 2010) 563 at 566.

[135] *Articles on Responsibility, supra* note 121, Article 31; *Draft Articles Commentaries, supra* note 124 at 87.

[136] Cheng, *Studies, supra* note 118 at 603; Cheng, "Article VI" *supra* note 120 at 9; *Case Concerning the Factory at Chorzów (Germany v Poland) (Merits)* (1928) PCIJ (Ser A) No 17 at 29, 47 [*Chorzow, Merits*]; *British claims in Spanish Zone of Morocco Claims(Great Britain v. Spain)* (1924) 2 R.I.A.A. 615 at 641 (Max Huber) [*Spanish Zone*]; Daniel-Erasmus Khan, "Max Huber as Arbitrator: The Palmas (Miangas) Case and Other Arbitrations" (2007) 18:1 EJIL 145 at 153-158; Malcolm Shaw, *International Law* (Cambridge, U.K.: Cambridge University Press, 2003) at 694.

[137] *Spanish Zone, supra* note 136 at 641.

[138] *Articles on Responsibility, supra* note 121, Article 34

of reparation, i.e. wiping out all consequences of the wrongful act and re-establishing the situation that would have existed had the act or omission not been committed. Hence, it comes first amongst the forms of reparation. But it is often impossible, unavailable, too inflexible, poses legal and practical difficulties and is generally not preferred by an injured State. If restitution in kind is not possible, then compensation is to be paid as reparation for the internationally wrongful act.[140] The amount of compensation is determined according to principles such as the "sum corresponding to the value which restitution in kind would bear" and "award...of damages for loss sustained which would not be covered by restitution in kind or payment in place of it."[141] Compensation covers any financially assessable damage including loss of profits[142] and other costs that are reasonable and proximately caused by the wrongful act.[143] Compensation, however, does not include exemplary or punitive payment.[144] It is worthy to mention here that it is an established principle of law[145] that an international court or tribunal which has jurisdiction over a claim of State responsibility, also has the power to award compensation as an aspect of that jurisdiction. As Ian Brownlie wrote, "The duty to pay compensation is a normal consequence of responsibility but is not conterminous with it."[146]As mentioned earlier, satisfaction, which can be an acknowledgement of the breach, an expression of regret, a formal apology or another appropriate modality is the third form of reparation.[147] Of all these forms of reparation, compensation is the most

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[139] See *Articles on Responsibility, supra* note 121, Article 35.
[140] *Gabcikovo-Nagymaros Project (Hungary v Slovakia)* [1997] ICJ Rep 7 at 81*; Case Concerning the Factory at Chorzów (Germany v Poland) (Jurisdiction)* (1927), PCIJ (Ser A) No 9. [*Chorzow Jurisdiction*].
[141] *Chorzow Jurisdiction, supra* note 140 at 47; *M/V "Saiga" (Saint Vincent and the Grenadines* v. *Guinea*, No 2, [1999] ITLOS Reports at 65.
[142] *Articles on Responsibility, supra* note 121, Article 36(2) ; *Affaire des navires Cape Horn Pigeon, James Hamilton Lewis, C. H. White et Kate and Anna* (1902) 9 UNRIAA 63 at 66 ; *Sapphire International Petroleums Ltd.* v. *National Iranian Oil Company* (1963) 35 ILR 136 at 187, 189.
[143] See *Canada Claim, supra* note 101 at 907.
[144] See *Velásquez Rodriguez*, *Compensatory Damages case* (1989) Inter-Am Ct HR (Ser C) No 7; *Letelier and Moffitt* (1992) 88 ILR 727 (Commission for settlement of disputes).
[145] *Chorzow Jurisdiction, supra* note 140 at 21; *Nicaragua, supra* note 122 at 142; *Fisheries Jurisdiction (Federal Republic of Germany* v. *Iceland)*(*Merits)* [1974] ICJ Rep 175 at 203–205.
[146]Brownlie, supra note 121 at 421.
[147]*Articles on Responsibility, supra* note 121, Article 37.

appropriate and often claimed, especially if there is damage due to the wrongful act. As Grotius says, "money is the common measure of valuable things."[148]

Liability means the "obligation to bear consequences of a breach of legal duty, in particular the obligation to make reparation for any damage caused, especially in the form of monetary payment."[149] Thus, liability is nothing but the obligation to make reparation, which is an aspect and consequence of responsibility.

To sum up, under general international law, damage, attributed to a State and caused by breach of its obligations, is to be paid for by the responsible State as reparation.

3. Assessment

Under general international law, a State is liable only for internationally wrongful acts attributable to it. Hence, if it does not have control over a satellite, it cannot be held liable for it; whereas the State which has actual control will be liable as the act can be attributed to it. However, the special regime of outer space law puts emphasis on 'launching', bringing in inconsistencies, as will be discussed in next sub-chapter.

Also, under general international law, a State is only indirectly responsible for private space activities, unlike in space law, where a State is directly responsible for private activities.[150]

B. International Space Law

Questions of responsibility and liability in space law are addressed in two treaties: the Outer Space Treaty and the Liability Convention. Because generally, space law applies to outer space, it is important to determine who is liable and responsible, under space law, for a satellite's operation after an on-orbit transfer takes place.

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[148] Hugo Grotius, *The Rights of War & Peace* , translated with notes by J.Barbeyrac (Clark, New Jersey: The Lawbook Exchange, 2004), vol 2 , chapter 17, xxii.
[149] Cheng, "Article VI", *supra* note 120 at 9-10.
[150] See Part-I.B.1.a below.

1. Responsibility

a. Article VI of Outer Space Treaty: Commentary

In 1962, the UN General Assembly through COPUOS began considering the issue of responsibility in outer space in light of the high risk of damage being caused due to space activities. The present concept of state responsibility in space law is articulated in Article VI of Outer Space Treaty and is similar to the related principle in the Declaration of Legal Principles.[151] Article VI reads as:

> States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty. When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

The legislative history of the Outer Space Treaty shows that private activity in outer space was contemplated by States even at the time of drafting of the Treaty.[152] In fact, the USA expressly supported involvement of private players[153] but was opposed by the USSR which wanted only States to undertake space activities.[154] Article VI of the

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[151] See *Declaration of Legal Principles, supra* note 10, Principle 5 ("States bear international responsibility for national activities in outer space, whether carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried on in conformity with the principles set forth in the present Declaration. The activities of non-governmental entities in outer space shall require authorization and continuing supervision by the State concerned. When activities are carried on in outer space by an international organization, responsibility for compliance with the principles set forth in this Declaration shall be borne by the international organization and by the States participating in it.").

[152] See also, P.M. Sterns, "Space Law in the 21st Century: The Outer Space Treaties Revisited*"* in *Proceedings of the Forty-sixth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2003)136 at 136.

[153] Ambassador Stevenson (Statement delivered at the First Committee of the General Assembly, 4 December 1961), cited in J .A. Johnson, "Freedom and Control in Outer Space" in *Proceedings of the Conference on Space Science and Space Law* (1963) 139 .

[154] *Declaration of the Basic Principles governing the Activities of States pertaining to the Exploration and Use of Outer Space (USSR Proposal to Legal SubCommittee),*UN Doc A/AC.105/C.2/L.1, reproduced in *Report of the Legal Sub-Committee on the work of its First Session* , UNGAOR, 1962, UN Doc A/AC.105/6 at 4; *Proposals submitted to the Committee on the Peaceful Uses of Outer Space at its second session*, UNGAOR, 17th Sess, Annex 3, Agenda Item 27, UN Doc 5181(1962).

Outer Space Treaty is a compromise between the two schools of thought.[155] Private activity was allowed, provided States assumed responsibility for such acts, committed to authorize and supervise private activities and ensured that they complied with Outer Space Treaty.[156]

The first sentence of the article states the following:

i) States are internationally responsible for their national activities in outer space;

ii) Such national activities include those by both governmental and non-governmental entities;

iii) States have the duty to assure, i.e. guarantee that national activities are carried out in conformity with the Outer Space Treaty.

'National activity' means not only a State's own activities, but also any act or omission that has a connecting link with a State, its nationals, territory or facility[157] and over which a State has effective jurisdiction.[158] It includes private space activity. One space activity may be national activity of several States. For example, launching of a satellite may be national activity of several States such as the State of nationality of the entity launching, the State whose territory is used for launching and the State which furnished financial resources.

It is important to mention here that the regime of State responsibility in outer space is radically different in certain ways from the general concept of State

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[155] Legal Sub Committee, Committee on the Peaceful Uses of Outer Space, *Summary Record of the Twentieth Meeting* , UNGAOR, 2nd Sess, UN Doc A/AC.105/C.2/SR.20 (1963) (the USSR later agreed that "it would be possible to consider the question of not excluding from the declaration the possibility of activity in outer space by private companies, on the condition that such activity would be subject to the control of the appropriate State, and the State would bear international responsibility for it."); See Frans von der Dunk, "Report of the 3rd Eilene M. Galloway Symposium on Critical Issues in Space Law- Article VI of the Outer Space Treaty: Issues and Implementation" in *Proceedings of the International Institute of Space Law* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2008) 531 at 532.

[156] See generally C. Wilfred Jenks, *Space Law* (London: Stevens & Sons, 1965) at 211. [Jenks, *Space Law*].

[157] See Ram Jakhu, "Implementation of Art VI of Outer Space Treaty in North America" (Paper delivered at the 3rd Eilene M. Galloway Symposium on Critical Issues in Space Law on theme "Art. VI of the Outer Space Treaty: Issues and Implementation" ,Washington D.C., 11 December 2008).

[158] Cheng, *Studies*, *supra* note 118 at 603; Cheng, "Article VI", *supra* note 120 at 23-26; Bin Cheng, "International Responsibility and Liability for Launch Activities" (1995) 20:6 Air & Space L 297 at 309; Bin Cheng, "International Responsibility and Liability for Launch Activities", in Cia-Jui Cheng, ed, *The Use of Air and Outer Space Cooperation and Competition* (The Hague: Kluwer Law International, 1998) 159 at 173.

responsibility. As discussed earlier, State responsibility is generally divided into two categories: direct responsibility and indirect responsibility.[159] Generally, a State is directly responsible only for acts by its agents and servants in official capacity as generally, imputability is one of the requirements for holding a State internationally responsible.[160] But under space law, even acts of non-governmental entities are 'deemed' to be acts of State.[161] As has been explained by Bin Cheng, international State responsibility in outer space for private space activities arises the moment a breach of an international obligation is committed unlike in general international law, where State's responsibility for non-governmental entities arise when the State fails in its duty to prevent or repress such breach.[162] This is because under space law, State is immediately accountable for the breach internationally as if it itself had breached the international obligation.[163] Hence, the State is responsible for space activities by its private entities, even if it has been ignorant of such activity or has taken best efforts to control an activity.[164] On this basis, it can be said that the second part of Article VI (ensuring compliance with Treaty) and second sentence of Article VI (authorization and supervision of activities of non-governmental entities by appropriate State) do not exhaust the scope of responsibility stated in the first part of the first sentence. These are merely certain specific duties flowing from the more general responsibility of a State for all of its 'national activities' and mentioned so as to emphasize them but not to undermine the scope of the general responsibility.[165] However, some States still seem to continue to believe that they are only indirectly responsible for space activities. For example, the stance of the Netherlands is that the law of responsibility in space law is not

[159] See text accompanying footnotes 130 and 131.
[160] *Articles on Responsibility, supra* note 121, Article 2.
[161] See generally, J.E.S. Fawcett, *Outer Space: New Challenges to Law and Policy* (Oxford: Clarendon Press, 1984) at 41; Armel Kerrest, "The Need to Implement the Outer Space Treaty through National Law in the Light of the Current and Foreseeable Space Activity" (Paper delivered at Vienna, 22 March 2010) in *Proceedings of the IISL/ECSL Symposium: National Space Legislation: Crafting Legal Engines for the Growth of Space Activities: The Need for National Space Legislation* (2010) [Kerrest, "National Law"]; Gyula Gal, "Public International Law, Private Laws and private International Law in the System of space liability" in *Proceedings of the Forty-Third Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2000) 157 at 157-158; Kerrest, "Remarks", *supra* note 22 at 138.
[162] Cheng, "Article VI", *supra* note 120 at 15.
[163] *Ibid.*
[164] Kerrest, "Remarks", *supra* note 22 at 139.
[165] Cheng, *Studies, supra* note 118 at 606.

different from the law of responsibility of States under general international law.[166] According to it, a State only has due diligence and other indirect responsibility for private space activities for which the Netherlands accepts responsibility.[167] Hence, the Netherlands accepts only responsibility for the NSS satellites which were delivered-in-orbit and purchased on orbit and not liability for them.[168]

The second sentence of Article VI lays down the specific responsibility of authorization and continuing supervision by the appropriate State. This is often done by national regulation on licensing of space activities.[169]

It is important to understand the concept of 'appropriate State' in this context, though it has not been defined in the Outer Space Treaty. The State having territorial jurisdiction,[170] the State of seat of the non-governmental entity,[171] the launching State,[172] the State of production[173] or any State having a connection with the space activity[174] may

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[166] Olivier Ribbelink, "The Registration Policy of the Netherlands", (Paper delivered at the "Current Issues in the Registration of Space Objects" Workshop, 20-21 January 2005, Berlin).
[167] *Ibid*.
[168] *Note verbale dated 29 July 2003 from the Permanent Mission of the Netherlands to the United Nations (Vienna) addressed to the Secretary-General,* UNGAOR, UN Doc A/AC.105/806 (22nd August 2003) [*Note verbale Netherlands,* 2003] and *Note verbale dated 18 February 2004 from the Permanent Mission of the Netherlands to the United Nations (Vienna) addressed to the Secretary-General,* UNGAOR, UN Doc A/AC.105/824, (16 March 2004) [*Note verbale Netherlands,* 2004].
[169] See *Application of the Concept of the Launching State,* GA Res 59/115, UNGAOR, 59th Sess., UN Doc A/RES/59/11 (2004) [UN GA Res 59/115] (This resolution basically presents the recommendations of the COPUOS Legal Subcommittee's Working Group.); Paul Stephen Dempsey, "Liability for Damage Caused by Space Objects under International and National Law" in *Proceedings of International Institute of Space Law,* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2011) 165 at 166, 169; Edward A. Frankle and E. Jason Steptoe, "Legal Considerations Affecting Commercial Space Launches From International Territory" in *Proceedings of the Forty-Second Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1999) 297 at 302.
[170] Ricky J. Lee, "Liability Arising from Article VI of the Outer Space Treaty: States, Domestic Law and Private Operators" in *Proceedings of the Forty-Eighth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2005) 216.[Lee, " Liability"]
[171] Stephen Gorove, "Liability in space Law: An Overview" (1983) 8 Ann Air & Sp L 373 at 377 [Gorove, "Liability"].
[172] Karl-Heinz Bockstiegel, "The Term 'Appropriate State' in International Space Law" in *Proceedings of the Thirty-Seventh Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1994) 77.
[173] *Ibid*
[174] Istvan Herczeg, "Problems of Interpretation of the Space Treaty of 27th January, 1967: Introductory Report" in *Proceedings of the Tenth Colloquium on the Law of Outer Space* (California, USA: The University of California School of Law, 1968) 105 at 108.

be an appropriate State which should be determined on case to case basis.[175] Though the Treaty mentions the appropriate "State" and not "States", it cannot be said that there should be only one appropriate State with the "most appropriate connection"[176] with the activity.[177] This is because, if an activity is a national activity of several States which are responsible and even liable as launching States,[178] it is unlikely that these States will give up the power to authorize and supervise the space activities to one appropriate State. Of course, this does not mean that States cannot by agreement give the power to one such State. The other States, however, continue to be internationally responsible even after such agreement.[179]

This view has been supported by practice, as several national space legislations, like that of USA[180] and Australia[181] govern space activities both in their territory and by nationals outside of their territory. Thus, an USA national launching a satellite from Australian territory would be governed by both USA and Australia's laws. However, national laws of some States provide that applying for a license in that State is not required in the case of arrangements made between that State and another appropriate State, in which such other State agrees to authorize and supervise the space activity.[182]

The second sentence of Article VI is the most important from a domestic concern and forms the basis for national space laws.[183] Though, such national space laws are desirable, it cannot be said that by requiring "authorization", Article VI mandates every State Party to enact national space laws because authorization can be done by a State without specific laws for outer space.

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[175] Karl-Heinz Bockstiegel, "The Terms 'Appropriate State' and 'Launching State' in the Space Treaties-Indicators of State Responsibility and Liability for State and Private State Activities" in *Proceedings of the Thirty-fourth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1991)13 at 14 [Bockstiegel, "Indicators"].
[176] See *Ibid*; Lee, "Liability" *supra* note 170.
[177] *See* Herczeg, *supra* note 174 at 107-108.
[178] See part II.B.2.b. below (for definition of launching State).
[179] Cheng, "Article VI", *supra* note 120 at 28.
[180] *Commercial Space Act,*49 U.S.C.§70101 (1998) (USA)
[181] *Space Activities Act 1998,* Act No 123 of 1998 (Australia) s 6, 11 & 12; *Space Activities Regulation 2001* (Australia).
[182] See e.g. *Outer Space Act 1986* (UK) s 3(2)(b).
[183] Dembling, "Treaty", *supra* note 118 at 17.

2. Liability

The question of liability, i.e. the legal obligation to repair a loss for damage by space object, is addressed in Article VII of the Outer Space Treaty and the Liability Convention.

a. Outer Space Treaty

Article VII of the Outer Space Treaty provides:

> Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the Moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the Moon and other celestial bodies.[184]

The Treaty states that damage may be caused by a space object or its component parts. The damage can occur on Earth, in airspace or in outer space. There are four categories of States which are internationally liable for damage by space objects to another State Party or its natural persons, namely:

i) the State that launches an object into outer space;

ii) the State that procures the launching of an object into space;

iii) the State from whose territory an object is launched into space; and

iv) the State from whose facility an object is launched.

This list is exclusive and not inclusive. These States are liable for both their governmental and non-governmental space activities.[185] Thus, the Outer Space Treaty creates the possibility of four States being simultaneously, jointly and severally liable for the damage. Article VII lays down that the States in question are internationally subject to the legal obligation to make reparation, particularly to compensate the victim State for the damage caused to it by the space object.

The Outer Space Treaty does not provide for a specific procedure, but States may enter into diplomatic negotiations to decide on the form of settlement of disputes.[186]

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[184] See also *Declaration of Legal Principles, supra* note 10, Principle 8

[185] Cheng, *Studies, supra* note 118 at 237.

[186] See Gorove, "Liability"*, supra* note 171 at 376.

Further, the amount of compensation to be paid by the State(s) liable is not fixed. Also, there is no limitation of time for making a claim.

It is not clear from Article VII what "is internationally liable for damage" means.[187] When the breach of obligation requirement is removed, liability is absolute liability or no-fault liability. It is debatable whether, in general international law, there is yet an existing principle for no-fault liability for damage caused by ultra-hazardous activities of States.[188] During the drafting of the Outer Space Treaty, an Indian representative said that "the word internationally had not been explained and would be acceptable to his delegation only if the Powers concerned made it clear that it meant absolutely [liable]."[189] But no express clarification was made that Article VII removed the breach of obligation requirement.[190] This question has been later answered by the Liability Convention.

b. Liability Convention

The Liability Convention elaborates on Article VII of the Outer Space Treaty and is highly victim oriented.[191] It lays down "international rules and procedures concerning liability for damage caused by the launching of objects into outer space."[192]

i. Definitions

The States, which are held internationally liable under Article VII of Outer Space Treaty and Liability Convention are the same, except that unlike in Outer Space Treaty, such States are defined as launching States in Liability Convention. Article I (c) states:

The term "launching State" means:

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[187] William A. Hyman, *Magna Carta of Space* (Amherst: Amherst Press, 1966) at 273.
[188] See C. Wilfred Jenks, "Liability for Ultra-Hazardous Activities in International Law" (1966) 117:1 Rec des Cours 99 at 99-100*;* Karl Zemanek, "Causes and Forms of International Liability", in Bin Cheng and E.D. Brown, eds, *Contemporary Problems of International Law: Essays in Honour of Georg Schwarzenberger* (London: Stevens, 1988) 319 at 324-6.
[189] COPUOS LSC, 5th Sess, 71st Mtg, UN Doc A/AC.105/C.2/SR.71 (1966) at 10.
[190]See Dembling, "Treaty", *supra* note 118 at 19. (while discussions regarding Article VII of the Outer Space Treaty was going on, it was recognised that legal SubCommittee was already in the process of drafting a detailed treaty on liability and as the French delegate stated questions of liability and assistance were extremely complicated and any reference o them in the outer space treaty should be brief and merely establish the principle).
[191] See *International co-operation in the peaceful uses of outer space*, GA Res 2733 (XXV), UNGAOR, 25th Sess, (1970); Maniatis, *supra* note 108 at 378.
[192] *International co-operation in the peaceful uses of outer space,* GA Res. 2601B (XXIV), UNGAOR, 24th Sess (1969).

(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 these four criteria, it is evident that there can be more than one launching State. The matter is often complicated. It may be difficult to identify the launching States as in case of the Sea Launch.[193] Under the Convention, launching also includes attempted launching.[194]

'Damage' has been defined in the Convention as loss of life, personal injury or other impairment to health, or loss of or damage to property.[195] Damage has to be caused by a space object as a prerequisite to be covered under the Liability Convention.[196] The Convention does not cover indirect economic damage or immaterial damage, other than impairment of health. It offers the reasonable expectation of prompt and fair compensation but does not in any way seek to penalize a launching State.[197]

A full definition of the term 'space object' has not been given in the Convention, as discussed above.[198]

ii. Applicability

The Convention applies to damage caused by both civilian and military satellites,[199] irrespective of whether the damage occurs on earth, in airspace or in outer

[193] Sea Launch is a multi-national venture established in 1995. It was the first private launch service provider. Its original partners were: Boeing (US) 40%,Korolev Rocket & Space Corporation Energia (Russia) 25%, Kvaerner (Norway) 20%, Yuzhnoye/Yuzhmash (Ukraine) 15%. At present, it is owned by Boeing (USA) and Kvaerner (Norway) together 5% and Russia: 95%. It is incorporated in Switzerland. Its rockets are launched from a platform in high seas and the launch vehicle used is Ukrainian Zenit 3SL launch vehicle and the platform (facility) is registered in Liberia which is not party to the Liability Convention; *See generally,* Armel Kerrest, "Launching Spacecraft from the Sea and the Outer Space treaty: The Sea Launch Project" in *Proceedings of the Fortieth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics,1997) 264.
[194] *Liability Convention*, *supra* note 13, Article I (b). See Gyula Gál, "Space Treaties and Space Technology: Questions of Interpretation" in *Proceedings of the Fifteenth Colloquium on the Law of Outer Space* (California: University of California School of Law, 1973) 105 at 105; Bockstiegel, "Indicators", *supra* note 175 at 15 (Borrowing concepts from criminal law, Stephen Gorove has suggested that to distinguish attempted launching from pre-launch preparations, the attempted launching must be intended, not impossible of commission, there must be perpetration or 'execution and not mere preparation, the means used must be adequate and they must have come close to success).
[195] *Liability Convention*, *supra* note 13, Article I (c),
[196] See Gorove, "Cosmos 954", *supra* note 40 at 139.
[197] United States Mission, Press Release (30 June 1971) at 3, cited in Aldo Armando Cocca, "From Full Compensation to Total Responsibility" in *Proceedings of the Twenty-Sixth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics,1983) 157 at 158.
[198] *Liability Convention*, *supra* note 13, Article I (d); See text accompanying note 48-52.

space. The Convention, however, does not apply to damage caused by a space object of a launching State to "nationals of *that* launching State."[200] What happens if there is more than one launching State? According to one view, application of the provision precludes all claims by nationals of launching States against any or all launching States. The rationale behind this argument is that, if a launching State presents a claim on behalf of its nationals to other launching States, the respondent States will have a right to contribution or indemnification from the claimant State.[201] The other view is that the Liability Convention does not apply to damage caused by a launching State to its own nationals. Hence, in cases of more than one launching States, a national of one launching State can present a claim to foreign launching States.[202] Thus, Article VII (a) simply restates the basic principle that international law generally does not deal with relations between a State and its nationals.[203] The second view is compatible with the wording of the Article, namely, "launching State" (in singular) and "nationals of *that* launching State", which imply that claims could be brought against launching States other than *that* launching State. Also this interpretation fits with the victim-oriented approach of the Convention.

The Convention also does not apply to foreign nationals, participating in the operation of a space object, or to foreign nationals in the immediate vicinity of planned launching or recovery.[204] This is based on the principle of *volenti non fit injuria.*[205]

iii. Regimes of Liability

The regime of liability is not the same in all the locations. Article II of the Liability Convention lays down an absolute liability regime for damage occurring on the

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[199] Maniatis, *supra* note 108 at 379.
[200] *Liability Convention*, *supra* note 13, Article I(b). [emphasis added].
[201] Ricky Lee, "The Liability Convention and Private Space Launch Services- Domestic Regulatory Responses" (2006) 31 Ann Air & Sp L 351 at 357-58. [Lee, "The Liability Convention"].
[202] Matte, *Scientific Exploration, supra* note 2 at 158; Bruce A. Hurwitz, *Space Liability for Outer Space Activities in Accordance with the 1972 Convention on International Liability for Damage caused by Space Objects* (Dordrecht, the Netherlands: Martinus NIjhoff Publishers, 1992) at 44.
[203] Bin Cheng, "Convention on International Liability for Damage caused by Space Objects" in Nandasiri Jasentuliyana and Roy S.K. Lee, eds, *Manual of Space Law,* vol 1, (New York: Oceana Publications, Inc, 1979) 83 at 101.
[204] *Liability Convention*, *supra* note 13, Article VII.
[205] To a willing person, damage is not done.

surface of the Earth or to an aircraft in flight.[206] The harshness of absolute liability is mitigated by certain provisions which exonerate the liability. If the space activity was conducted according to international law, particularly the Charter of United Nations and the Outer Space Treaty, a launching State will be exonerated from absolute liability to the extent it establishes that damage is caused, partly or wholly, due to gross negligence or an intentional act or omission by a claimant State or its nationals.[207]

Article III of the same Convention lays down the fault or negligence-based liability regime for damage caused by a space object to another space object or to persons or property on board a space object while in space. It applies only when damage caused is international i.e has a foreign element involved.

iv. Jointly and Severally Liable

Article IV deals with a situation when damage is caused by one space object to another,[208] elsewhere than on surface of earth, and it results in damage to a third State.[209] Launching States of both the space objects are jointly and severally liable to the third State. Paragraph 2 of the Article IV provides that liability shall be apportioned according to fault and if fault is not determined, then equally between the launching States of space objects that collided.

Also, from the definition of launching State, it is clear that there can be more than one launching State for a space object. All of these launching States are jointly and severally liable for damage, i.e. a victim may approach the launching States, individually or severally.[210] This helps the victim to easily identify at least one State to be held liable and, in the case that more than one State is identified, the victim has the option of bringing the claim against the State from whom effective recovery is more likely in line

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[206] *Liability Convention*, *supra* note 13.
[207] *Liability Convention*, *supra* note 13, Article VI.
[208] Apart from physical collision, such damage can be caused when laser beam from one space object damages another space object.
[209] See *Liability Convention*, *supra* note 13, Article IV; See Lee, "The Liability Convention", *supra* note 201 at 357.
[210] *Liability Convention*, *supra* note 13, Article V.

with the deep pocket theory.[211] The Convention puts all launching States on an equal plane from the victim's viewpoint, irrespective of the launching States' interests and involvement in the launch or fault in the damage caused.[212]

A launching State, that pays compensation, has the right to make a claim for indemnification from other launching States.[213] If the launching States have had equal participation in the launch, liability should be apportioned on the basis of their fault, and if fault cannot be ascertained, then equally. However, it has been questioned whether the launching States, which only allow their territory or facility to be used, and do not derive any benefit from the launch, or which do not own or operate the space object, should be held liable equally with the State which launches the object and derives benefits.[214] As of now, the matter is subject to negotiation between the launching States. The States may agree between themselves regarding apportioning of financial obligations for which they are jointly and severally liable[215]and to avoid future issues, it is recommended that launching States enter into such agreements before the launch.[216] These agreements are without prejudice to the right of a victim State to seek the entire compensation due under the Convention.[217] It is pertinent to mention here that one type of liability agreement entered into in joint launches is a cross-waiver of liability through which partners in space missions agree not to seek recovery of damage from each other.[218] For example: The International Space Station Agreement includes a cross-waiver of liability between the partners.

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[211] See *Black's Law Dictionary,* 9th ed, *sub verbo* "Deep Pocket" ("A person or corporation of substantial wealth and resources, from which a claim or judgment may be made")
[212] Mathias Forteau, "Space Law", in James Crawford, Alain Pellet and Simon Olleson, eds, *The Law of International Responsibility* (Oxford: Oxford University Press, 2010) 903 at 905.
[213] *Liability Convention*, *supra* note 13, Article V(2).
[214] *Launching State: Secretariat Report, supra* note 44 at 16-17.
[215] *Liability Convention*, *supra* note 13, Article V(2).
[216] UN GA Res 59/115*, supra* note 169 at 2 ; *Report of the Legal Subcommittee on its forty-second session*, UNCOPUOSOR, 2003, UN Doc A/AC.105/L.249 at 2: *Launching State: Secretariat Report, supra* note 44 at 13.
[217] *Liability Convention*, *supra* note 13, Article V(2).
[218] *Launching State: Secretariat Report*, *supra* note 44 at 14; See Jenks, *Space Law, supra* note 156 at 289; Frans G. von der Dunk, "Commercial Space Activities: An Inventory Of Liability - An Inventory Of Problems" in *Proceedings of Thirty-Seventh Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics,1994)161 at 166 [von der Dunk, "Commercial Space Activities"].

v. Amount of Compensation and Settlement of Claims

The amount of compensation is determined according to general international law and principles of equity and justice, so as to provide reparation for the damage.[219] The reparation should restore to the injured person, natural or juridical, State or international organization, to the condition that would have existed if the damage had not occurred.[220]

Regardless of the fact whether the injured party is a governmental or a private entity, only States, and not individuals, have the right to set up claims.[221] The State which suffers damage or whose natural and juridical person suffers damage may bring the claim at its discretion.[222] If the State of nationality has not presented the claim, the State in whose territory damage is sustained by any natural or juridical person may bring the claim against a launching State.[223] If the abovementioned States do not present the claim or do not notify their intention to do so, another State may present it to a launching State for damage sustained by its permanent residents.[224]

Settlement of claims for compensation under the Liability Convention is done initially through diplomatic channels,[225] presented to a launching State, not later than one year after occurrence of the damage.[226] Presentation of a claim does not require the prior exhaustion of local remedies.[227] However, this remedy does not prevent local remedies in courts, administrative tribunals or agencies from being pursued. To prevent duplication of claim, while local remedies or other remedies are being availed of, the claim cannot be presented under the Convention for the same damage.[228]

In case of a failure to resolve a dispute after one year from the date of submission of documentation of claim, a Claims Commission, which decides on the merits of the

[219] *Liability Convention, supra* note 13, Article XII.
[220] *Liability Convention, supra* note 13, Article XII.
[221] *Liability Convention*, *supra* note 13, Article VIII
[222] *Liability Convention*, *supra* note 13, Article VIII (1).
[223] *Liability Convention*, *supra* note 13, Article VIII (2).
[224] *Liability Convention*, *supra* note 13, Article VIII(3).
[225] *Liability Convention, supra* note 13, Article IX.
[226] *Liability Convention, supra* note 13, Article X
[227] *Liability Convention, supra* note 13, Article XI(1)
[228] *Liability Convention, supra* note 13, Article XI(2)

case and amount of compensation,[229] is established at the request of either party.[230] The objective of having a Claim Commission dispute resolution process is to initiate an independent process in which the claimant State will be able to reach a definitive conclusion on the question of liability and the amount of liability, with, but if necessary also without, the co-operation of launching State.[231]

Until now, only one claim has been under made Liability Convention.[232] It was the case of the USSR's Cosmos 954 falling in north Canada. The final settlement reached after negotiations, however, does not refer to the Liability Convention.[233]

National space laws generally contain an indemnification clause under which the licensee has to indemnify the State, if the licensee's space activity incurs international liability of the State.[234]

vi. Insurance

In order to ensure compensation to victims and to protect national governments from incurring liability under the Liability Convention, national space laws of several States require an entity to obtain insurance before it can carry out launch activity, operate a launch site, etc.[235] For example, Australian law imposes insurance or financial requirements as a condition of a launch permit (for launches from Australia) and in some situations, for an overseas launch certificate (for launches outside Australia). The holder of the authorization or permit must either obtain sufficient insurance or demonstrate direct financial responsibility for the maximum probable loss. To ease the availability of insurance policies, States often put a ceiling on the liability in their national laws. For example, for French Guyana Kourou launches, the private entities must take insurance but only up to a certain level (400 Mfr). For liability arising beyond that, the amount is to

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[229] *Liability Convention, supra* note 13, Article XVIII.
[230] *Liability Convention, supra* note 13, Article XIV.
[231] Cheng, *Studies, supra* note 118 at 351; See *Liability Convention, supra* note 13, Articles XIV, XV(2), XVI(1) and XVII.
[232] *Canada: Claim*, *supra* note 113.
[233] *Protocol Cosmos 954*, *supra* note 113.
[234] *See eg: Outer Space Act 1986* (UK); *Act on Space Activities 1982* (1982:963) (Sweden); *Space Affairs Act 1993,* No 84 of 1993 (South African Republic); *Space Activities Act 1998,* Act No 123 of 1998 (Australia).
[235] See Hyman, *supra* note 187 at 214. (The need for national insurance programs for space activities was suggested as early as in 1966 by Hyman.)

be paid by the French government. Space liability insurance is on occurrence basis and is linked to annual insurance coverage.[236]

C. Responsibility and Liability: non-parties to space treaties

The responsibility and liability for international space activities are essentially determined by the Outer Space Treaty and the Liability Convention. However, these treaties do not apply to non-State Parties. As Article 34 of Vienna Convention on the Law of Treaties, which is reflection of the customary law on law of the treaties,[237] provides, "a treaty does not create either obligations or rights for a third State without its consent."[238] The Outer Space Treaty, which is the most widely accepted of the space law treaties, has only 102 parties, and Liability Convention has 89 State Parties and 3 intergovernmental organizations declaring their acceptance to rights and obligations of the Convention. What law applies to the non-State Parties?

It is common practice to start, and sometimes to end, any listing of sources of international law by referring to the four sub-paragraphs of Article 38(1) of the Statute of International Court of Justice.[239] According to Article 38 of ICJ Statute[240] the sources of international law are:

a) treaties,

b) customary law,

c) general principles of law recognised by civilised nations, and

d) teachings of highly published publicists and judicial decisions as subsidiary sources.

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[236] Lesley Jane Smith, "Facing up to third party liability for space activities: Some reflections", in *Proceedings of the International Institute of Space Law* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2009) 255 at 258.

[237] *North Sea Continental Shelf Cases* (*Federal Republic of Germany v. Denmark; Federal Republic of Germany v. Netherlands)* [1968] ICJ Rep 3 at 12 [*Continental Shelf*]; Brownlie, *supra* note 121 at 608; *Legal Consequences For States Of The Continued Presence Of South Africa In Namibia (South West Africa) Notwithstanding Security Council Resolution 276 (1970)* (Advisory Opinion) [1971] ICJ Rep 16 at 47.

[238] *Vienna Convention on Law of Treaties*, 23 May 1969, 1155 UNTS 331 (entered into force on 27 January 1980), Article 34. [*Vienna Convention on Law of Treaties*].

[239] Paul Szasz, "General Law-making Processes" in O. Schachter and C.C. Joyner, eds, *United Nations Legal Order* (1995) vol. 1, 35 at 38.

[240] *Statute of the International Court of Justice*, 26 June 1945, 59 Stat. 1055, 33 UNTS 993 [*ICJ Statute*].

Though UN General Assembly Resolution is not listed as a source of international law in the ICJ Statute, some of the UN resolutions are regarded as law or at least, in the process of becoming law.[241] Though, majority of the UN general assembly resolutions are merely recommendations, having no binding force, they have some credence constituting evidence of opinions of government especially if adopted by consensus or without voting.[242] Also, some UNGA resolutions are adopted in the form of declarations and they have been viewed differently by scholars.[243] United Nations Office of Legal Affairs stated that:

> A declaration or a recommendation is adopted by a resolution of a United Nations organ. As such it cannot be made binding upon Member States, in the sense that a treaty or a convention is binding upon parties to it, purely by the device of terming it a 'declaration' rather than a 'recommendation'....However, in the view of the greater solemnity and significance of the declaration, it may be considered to import, on behalf of the organ adopting it, a strong expectation that Members of the international community will abide by it. Consequently, insofar as the expectation is gradually justified by State practice, a declaration may by custom become recognised as laying down rules binding upon States.[244]

When couched in language of laying down general principles, the resolutions form the basis for "progressive development of the law and the speedy consolidation of customary laws."[245]

Looking at space law making history, the most authoritative document found other than the treaties is the General Assembly resolution- Declaration of Legal Principles. Principle 5 of the Declaration, which deals with responsibility, and Principle 8, which deals with liability, have been imported substantially into Articles VI and VII of the Outer Space Treaty. It may be pertinent to note here that unlike the Liability

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[241] Andrei Terekhov, "UN General Assembly Resolutions and Outer Space Law" in Proceedings of the Fortieth Colloquium on Law of Outer Space (Washington D.C., USA: American Institute of Aeronautics and Astronautics,1997) 97; Carl Quimby Christol, *Space Law- Past, Present and Future* (Deventer: Kluwer, 1991) at 311; R.R. Baxter, "Treaties and Custom" (1970) 129 Rec des Cours 27 at 69-74.
[242] *Nicaragua, supra* note 122 at 98-104, 203-205; Brownlie, *supra* note 121 at 15.
[243] V. Kopal, "The Role of United Nations Declarations of Principles in the Progressive Development of Space Law", (1988) 16:1 J Space L 5 at 19; Chia-Jui Cheng, "New Sources of International Space Law" in Chia-Jui Cheng, eds, *The Use of Air and Outer Space Cooperation and Competition* (The Hague: Kluwer Law International, 1998) 207 at 222-223.
[244] S.M. Schwebel, "The Effect of Resolutions of the U.N. General Assembly in Customary International Law" in *Proceedings of the 73rd Annual Meeting of American Society of International Law* (Washington DC: American Society of International Law, 1979) 304; *United Nations Juridical Yearbook* (New York: UN, 1981) at 149.
[245] Brownlie, *supra* note 121 at 15.

Convention, Principle 8 of the Declaration of Legal Principles does not talk about any mechanism for redressing claims. It is up to the States to decide on the mechanism by negotiations. An Arbitral tribunal or claims tribunal may be set up. Also, the liability under principle 8 cannot be held to be absolute. Not until the conclusion of the Liability Convention, was absolute liability introduced in space law and no evidence indicates that it has become custom since.

The unanimous adoption of the Declaration of Legal Principles and subsequent incorporation of those principles in the Outer Space Treaty point toward the fact that at least, the most fundamental principles of the Declaration have become customary law. In any case, analysis of State practice shows that long before conclusion of the Outer Space Treaty, important principles of space law had been established as customary international law.[246] Brownlie argues that principles of the Declaration formed part of customary international law soon after its adoption.[247] Without going into the controversy of instant customary international law,[248] it cannot be denied that most publicists believe that international law, particularly customary law of outer space, does not require the existence of practice for a long period of time.[249]

However, undeniably, some difference of opinion exists regarding binding nature of the Declaration of Legal Principles. This is precisely the reason why the space treaties were entered into. Treaties establish unequivocally binding obligations for parties.[250] Hence, the Declaration of Legal Principles may not be found binding in circumstances and in these cases, general international law governs.

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[246] V.S. Vereshchetin & G.M. Danilenko, "Custom as A source of International Law of Outer Space" (1985) 13:1 J Space L 22 at 25; Qizhi He, "The Outer Space Treaty in Perspective" in *Proceedings of the Fortieth Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics,1997) 51 at 53.

[247] Brownlie, *supra* note 121 at 15; Manfred Lachs, *The Law of Outer Space: An Experience in Contemporary Law-Making*, (Leiden: Sithoff, 1972) at 138.

[248] See Bin Cheng, "United Nations Resolutions on Outer Space: "Instant" International Customary Law?" (1965) 5 IJIL. 23 at 35, 36, 46 (instant customary law is customary law that can form overnight, if a consensus among states on the existence of a certain rule is identified).

[249] Bin Cheng, "The 1967 Space Treaty: Thirty Years on" in *Proceedings of the Fortieth Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics,1997) XVII at XVIII, XIX. [Cheng, "Thirty Years On"]; *Continental Shelf, supra* note 237 at 43 ("[t]he passage of only a short period of time is not necessarily, or of itself, a bar to formation of a new customary law.").

[250] Terekhov, *supra* note 241 at 103.

In addition, damaged parties have the right to bring a suit against the concerned entity under national jurisdiction for tort or delict. Suit may also be brought against a manufacturer or a financier according to product liability[251] or lender's liability rules.[252] While applying these national laws, questions about applicable law may arise if foreign elements are involved. In these cases, private international law applies, and as conflict of law rules of each State varies, there comes legal uncertainty.[253] For damage sustained, private international law prescribes two rules for determining the applicable law: *Lex loci commissi* (law of the place where the act or event took place) and *lex loci damni* (place where damage was sustained).[254] In the recent past, there has been a tendency of courts to adjudge that *lex loci damni* applies.[255] Rome II Regulations[256] have simplified and limited the options arising by virtue of *lex loci delict commissi* and *lex loci damni* at least within European Union. Alongside the Rome Regulations, the Brussels I Convention limits the possibility of parallel actions under various jurisdictions. For non-EU States, their respective conflict of law rules govern.

D. Responsibility and liability after on-orbit transfer

Acts of non-governmental entities in outer space are deemed to be acts of State under Article VI of Outer Space Treaty. Hence, change in private ownership cannot alone result in any change of liable parties. Involvement of interested governments is necessary in an inter-State on-orbit satellite transfer. In the case of transfer of ownership between two entities in two States, the transferee State will be considered as the 'appropriate' State

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[251] Product Liability is liability for damage caused due to a defective product. In *Appalachian Insurance Co. v McDonell Douglas,* (1990) 18:1 J Sp L 41, insurers, by their right of subrogation, sued the subcontractor Hitco, for being negligent in designing, manufacturing and testing, and McDonnell, for being negligent in failing to warn of the risk of loss. Claims were rejected by the court as in the contract between owners of Palapa B-2 and McDonnell, McDonnell had excluded liability for negligence and had covered its sub-contractors too.

[252] Kozuka, *supra* note 34 at 303.

[253] Lawrence Collins (eds), *Dicey, Morris and Collins on the Conflict of Laws* (London: Sweet & Maxwell, 2006) at 4; David McClean, *J.H.C. Morris's The Conflict of Laws,* (London: Sweet & Maxwell, 2009) at 4.

[254] James Fawcett and Janeen Carruthers, eds, *Cheshire, North & Fawcett Private International Law,* (Oxford: Oxford University Press, 2008) at 766-767.

[255] Lesley Jane Smith, "Jurisdiction and Applicable Law in Cases of damage from Space in Europe- The advent of the most suitable choice- Rome II" in *Proceedings of International Institute of Space Law* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2008) 44 at 49.

[256] EC, *Regulation (EC) No 864/2007 of the European Parliament and of the Council of 11 July 2007 on the law applicable to non-contractual obligations* [2007] OJ 199 P. 0040 - 0049 [Rome II Regulations].

for continuing supervision and authorisation of the satellite. This is because the operation of the satellite will be the transferee State's national activity. Thus, once the transfer takes place, the transferor is no longer responsible for the activities in relation to the satellite.

On-orbit transfer of satellite may be of 3 kinds:

a) between two entities within a launching State;

b) between two launching States of satellites or entities within the two States; or

c) between a launching State and a non-launching State or entities in such States.

In the first case, no legal issues arise at the international level as the matter is within the domestic jurisdiction of the State. The State of registry and State of supervision/authorisation remains same. Also, there is no change in the launching State. This situation is beyond the scope of the thesis. Such a discussion will need an extensive analysis under various State laws.

In the second case, there is no change in liability of States because the transfer happens between two launching States which are already liable as launching States. They may enter into an agreement apportioning liability between themselves as per Article V of Liability Convention, without prejudicing a victim's rights. Furthermore, the new transferee becomes the appropriate State, responsible for continued supervision and authorisation, provided that it was not already the appropriate State before the transfer. In the transfer of Asiasat-1, Asiasat-2, APSTAR-I and APSTAR IA, the transfer was between launching States. The satellites were launched from the territory of China and the launch was procured by Hong Kong under the sovereignty of the UK. Hence, both China and United Kingdom were launching States. There was no change in liable States following transfer of the satellites, as both the transferor and transferee States, having been involved in the launch of the satellites, were liable from the beginning for any damage caused by satellites. The same occurred with Agila-2 (renamed ABS-5) whose ownership was transferred to ABS (China) with ABS's acquisition of Mabhay Satellite Corporation (Philippines), which owned and operated the satellite. China, from whose territory the satellite was launched, and Philippines were launching States and they were liable for any damage caused by the satellite. The satellite, thus, was transferred to a State

which was already a launching State and hence, already liable. Also, as a Chinese national owns the satellite after transfer, China is now the appropriate State and has to authorise and continuously supervise the activities of the satellite.

Transfers may also be between launching and non-launching States. One example is the purchase of the BSB-1A satellite (renamed SIRIUS) by a Swedish entity from the UK. The launching States were the USA from whose territory it was launched, and the UK, who procured the launching. Sweden was not an original launching State. Another example is the transfer of four INTELSAT satellites while on-orbit to New Sky Satellites (Netherlands). France and USA were launching States on behalf of INTELSAT, and the Netherlands was not involved in the launch. Another example is the purchase of Koreasat-2 and Koreasat-3 by ABS (China). China was not an original launching State, and the transfer was between a launching State and non-launching State. Also, in the past, Argentina was not the launching State of Anik CI and Anik CII satellites, which it had purchased from Telesat, Canada and which were operated by an Argentine corporation. In another case, when ABS (China) acquired LMSCV and LMI, LMI-I was transferred to China, which was a non-launching State.

It is in this third scenario that a multitude of problems arise. The new transferee State becomes the appropriate State under Article VI for continued supervision and authorisation and is responsible for the space activities of the satellite. Yet, it is not liable for any damage caused by the satellite, as it is not a launching State, at least by a strict interpretation of Article VII of Outer Space Treaty and the Liability Convention. This strict interpretation have been followed by States, such as the UK which became the new owner of INMARSAT satellites after the privatization of INMARSAT. Not being involved in the actual launch of the satellites, it asserted that it is not a launching State for the purposes of the Liability Convention and hence, not liable for the satellites.[257] Similarly, the Netherlands, to which four INTELSAT satellites were transferred, asserts that it is not a launching State and hence, not liable.[258] The transferor State, though it is

[257] *Note verbale dated 9 September 2002 from the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland to the United Nations (Vienna) addressed to the Secretary-General,* ST/SG/SER.E/417/Rev.1, 3rd December, 2002 [*Note verbale UK 2002*].
[258] *Note verbale Netherlands, 2004, supra* note 168 .

no longer the 'appropriate State' to authorise the space activity, nevertheless is liable as the launching State of the satellite. In the case of the INTELSAT satellites transferred to the Netherlands, France and the USA were launching States on behalf of INTELSAT and they continue to be liable, even after the satellites were transferred to the Netherlands. In the case of purchase of BSB-1A by Sweden from the UK, the UK, being a launching State, continues to be liable even after the transfer of the satellite.

The concept of launching State in the space treaties considers ownership irrelevant and defines a liable entity based on launch which means that once a liable State, always a liable State.[259] So, when the launching State transfers a satellite to a non-launching State over which the former has no jurisdiction and control, the launching State still continues to be liable.[260] The successor, being a non-launching State, is technically not liable under international law for damage caused by the satellite, despite having actual control over it. Obviously, when a comprehensive change of ownership does not bring about a change in the determination of liable parties, partial ownership transfers like lease of satellite do not result in any such change.[261] By forcing the launching State to maintain links with a space object, even after it is removed from the State's jurisdiction, the present law hinders commercial activity.

Apart from this, there are complications in identifying the launching States which may create legal issues both in the second and the third case. It is difficult to ascertain whether the transfer is taking place with a launching or non-launching State. For example, it is difficult to determine the State which procures the launch, because it is not clear whether procurement means buying a launch contract, buying satellites on-orbit, leasing of transponders, or entering into a contract having elements of exchange of funds

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[259] Henry Hertzfeld & Frans von der Dunk, "Bringing Space Law into the Commercial World: Property Rights without Sovereignty" (2005) 6:1 Chicago J Int'l L 81 at 89; *See* Aoki, "Satellite Ownership", *supra* note 82 at 8*;* Cheng, *Studies, supra* note 118 at 468; Susan Trepczynski, "The Effect Of The Liability Convention On National Space Legislation", (2007) 33:1 J Sp L 221 at 224.

[260] See Motoko Uchitomi, "State Responsibility/Liability for 'National' Space Activities" in *Proceedings of the Forty-fourth Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2001) 51 at 59; Kerrest, "National Law", *supra* note 161.

[261] Hertzfeld & von der Dunk, *supra* note 259 at 90.

or sale.[262] The term 'procures' has, especially, created confusion as to the level of involvement required for a State to be launching State.[263] An instance where determining the launching State was tricky was when OTRAG, a private company with its seat in Germany, assembled rockets abroad and launched them from privately built facilities in Zaire and Libya. The question was whether Germany could be said to have procured the launch because of the activity of one of its nationals, though the State was not in any way involved with the launch.[264]

In this context, reference may be drawn to the Netherlands' stance regarding NSS-6 and NSS-7 which were delivered on-orbit to a Dutch entity. Steve Stott, the then chief technology officer of New Skies stated that, the satellites were "designed exclusively by New Skies to match our customers' present and future business plans, while being extremely competitive with existing capacity in the region."[265] In the words of Dan Goldberg, the then chief executive officer of New Skies after the launch of NSS7, "After more than three years of continually striving to maximize the potential of the resources we inherited, we now have a satellite that was procured, designed and launched by New Skies, optimized to meet current and future market demands and customer requirements."[266] Clearly, this is a case of delivery-in-orbit and not purchase of a second-hand satellite. However, the Netherlands has a restrictive view of the term 'launching State'. In 2003, the Dutch government sent a *note verbale* to UN Secretariat where it asserted that it did not consider itself launching State for the delivery-in orbits.[267] The reason given was that the satellites were "delivered in orbit to New Skies Satellites after they were launched and positioned in orbit by persons not subject to the jurisdiction and control of the Netherlands."[268] However, launching and procuring launch are two separate criteria under Article I (c) of the Liability Convention and hence, procuring launch cannot

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[262] *See* Valérie Kayser, *Launching space objects* (Boston : Kluwer Academic, 2001) at 34; *Launching State: Secretariat Report*, *supra* note 44 at 17; Frankle & Steptoe, *supra* note 169 at 304.
[263] *See* Carl Quimby Christol, *The Modern International Law of Outer Space* (New York: Pergamon Press, 1982) at 115.
[264] Bockstiegel, "Indicators", *supra* note 175 at 15.
[265] "New Skies' NSS-7 satellite arrives at Arianespace launch site to be readied for mid-April launch", *Space REF* (20 March 2002), online: SpaceREF <http://www.spaceref.com/news/viewpr.html?pid=7827>.
[266] "New Skies' NSS-7 Atlantic Ocean region satellite successfully launched into orbit", *Business Wire* (17 April, 2002).
[267] *Note verbale Netherlands,* 2003, *supra* note 168.
[268] *Ibid.*

be interpreted so restrictively that it approximates launching.[269] Clearly, the Netherlands is a launching State for NSS6 and NSS7 and therefore, can be held liable for any damage caused by the satellites, despite its claiming otherwise.

Also, holding the State of facility from which launch takes place as a launching State gives rise to confusions, especially regarding the level or type of property interest a State should have in the facility to become the launching State.[270] Also, in case of launches from aircraft, an important question is when does the launch actually take place? Is it when the aircrafts starts or when the spacecraft separates from the aircraft?

The legal problems that arise due to the concept of launching State in space treaties, gives rise to the question as to why liability is affixed on launching State by drafters in the first place. The reason is that launch is the riskiest space activity, liability is fixed on the launching State.[271] In fact, even after half a decade of practice, lift-off remains a stressful moment for launch teams, customers, insurers and the public at large, especially those in the vicinity of launch. The texts of Liability Convention and Outer Space Treaty were adopted at a time when there were only two major space powers, the USA and the USSR. Almost all other States were potential victims. Hence, no doubt the Liability convention is victim-oriented. It was decided that someone should be held liable for damages caused due to space activities, irrespective of their fault and because launch is the riskiest phase, the States involved in launching are held liable under the Convention. Similar instances of fixing liability can be found in the International Convention on Civil Liability for Oil Pollution Damage[272] wherein the owner of an oil tanker is held liable both because he is supposed to pay or take insurance cover and because he is responsible for maintenance of ship. In space law, the launching State is

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[269] Bernhard Schmidt-Tedd & Michel Gerhard, "Registration of Space Objects: Which are the Advantages for States Resulting from Registration?" in Marietta Benko & Kai Uwe Schrogi, *Space Law: Current Problems and Perspectives for Future Regulation* (Ulrecht: Eleven International Publishing, 2005) 121 at 132 [Schmidt-Tedd & Gerhard, " Registration Advantages"].

[270] *See* Kai-Uwe Schrogl, "A new look at the "launching State: The results of the UNCOPUOS Legal Sub-Committee Working Group: Review of the concept of the launching State: 2000-2002" in *Proceedings of the Forty-Fifth Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2002) 286 at 290.

[271] Peter van Fenema*, The International Trade in Launch Services* (Leiden: H.Peter van Fenema, 1999) at 69.

[272] *International Convention on Civil Liability for Oil Pollution Damage*, 29 November 1969, 9 ILM 45 (in force 19 June 1975).

held liable even if it has no control, especially because the damage in these cases may be huge, and given the technicality of the processes, it is extremely difficult to prove fault.[273] Secondly, affixing liability on a launching State means that territorial jurisdiction of the State applies when the satellite is on Earth, at the time of launch and such jurisdiction is much more efficient than personal jurisdiction.[274] This, however, results in the transferor State is held liable even after on-orbit satellite transfer.

This principle, that the launching State is liable, has been disputed at the international level because it is contrary to principle of causation where casualty is linked to the event triggering the damage.[275] The question that comes to mind is that, if launching State does not have actual jurisdiction and control over a space object, whether should it be held liable for damage caused by the space object.[276] A reference may be drawn from the Principle 2(1) of the Principles Relevant to the Use of Nuclear Power Sources in Outer Space, which defines 'launching State' as "the State which exercises jurisdiction and control over a space object with nuclear power sources on board at a given point in time relevant to the principle concerned."[277] Unlike Article VII of Outer Space Treaty and the Liability Convention, 'jurisdiction and control' are an integral part of the definition of launching State under the Principles on Nuclear Power Sources.[278]

With a lack of jurisdiction and control, it may be difficult to prevent damage. At present, this may be taken into consideration when damage is not on surface of Earth and hence, the liability is fault-based. Of course, even in these circumstances, a State may be held at least partially liable for damage, as in instances of pre-existing design or orbit failure.[279] However, when the damage is on surface of Earth, the liability is absolute. A

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[273] Kerrest, "Remarks", *supra* note 22 at 136.
[274] Kerrest, "Transfer", *supra* note 62 at 3.
[275] *Report of the Committee on the Peaceful Uses of Outer Space*, UNGAOR, Supp No.20 UN Doc. A/54/20 (1999), part II.C.4(b) .
[276] *See* Schrogl, *supra* note 270 at 290 (apart from a case of on-orbit satellite transfer in which transferor is held liable for damage, the situation also arises when a State allows its territory to be used in launch and is not otherwise involved in the launch.)
[277] *Principles Relevant to the Use of Nuclear Power Sources in Outer Space* ,GA Res 47/68, UNGAOR, 47th Sess, 85th Mtg, UN Doc A/RES/47/68 (1992). [*Principles on Nuclear Power Sources*].
[278] Similar definition of 'launching State' is provided in *Registration Convention*, *supra* note 14, Article I(b).
[279] Kai-Uwe Schrogl & Charles Davies, "A New Look at the Concept of the 'Launching State' - The results of the UNCOPUOS Legal Subcommittee Working Group 2000 - 2002" (2002) 51 ZLW 359 at 370-371.

State is held liable for being launching State, despite having no control over the satellite, and having no right to authorise the activities of the space object under Article VI of Outer Space Treaty. Thus, in case of transfer of satellites on-orbit between launching and non-launching States, an entirely unreasonable situation arises where State, having no effective control, is held liable, at times even absolutely liable.[280]The Permanent Court of International Justice (PCIJ) stated, "words have to be interpreted in the sense that they would normally have in their context, unless such interpretation would lead to something unreasonable or absurd."[281]

However, as of now, the launching State, which transfers the satellites, continues to be liable as the Liability Convention does not foresee the possibility of extinguishing the liability of launching States[282] even though it result in unfair results.[283]

[280] See Uchitomi, *supra* note 260 at 59; Kerrest, "National Law", *supra* note 161; Lee, "Effects", *supra* note 68 at 151.
[281] *Polish Postal Service in Danzig,* (1925) Advisory Opinion, PCIJ (Ser B) No 11 at 39; *South West Africa Cases (Ethiopia v. South Africa.; Liberia v South Africa)* [1962] ICJ Rep 319 at 336.
[282] Lee, "Effects", *supra* note 68 at 151.
[283] See, Kerrest, "National Law", *supra* note 161.

II. THE QUESTION OF REGISTRATION IN ON-ORBIT TRANSFERS

Another important question related to on-orbit transfers is whether the transferee can become the new State of registry. This is particularly important as under space law, jurisdiction and control over satellite is a consequence of registration as will be discussed in this chapter. Before going into the problems of registration, which has been brought to light by on-orbit satellite transfers, it is necessary to look into the general law registration in outer space.

For years, systems of registration have existed for ships, aircrafts and motor vehicles. They exist because the State authorities need some information about the nature of vehicle to determine ownership, insurance and liability. A typical registration system has two components: a) markings on vehicles or objects and b) registration of such vehicles or objects by these markings, together with the parties legally responsible for them, in a registry.[284] Ships and aircrafts are generally registered in their national registers.[285] Registration is generally done with only one authority. Multiple registrations are not made.[286]

The system of registration under outer space law has been laid down in Article VIII of the Outer Space Treaty and the Registration Convention. Essential functions of system of registration in outer space are as follows:

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[284] *See* Nicolas Mateesco Matte, "The Convention on Registration of Objects launched into outer space", (1976) 1 Ann Air & Sp L 231 at 231[Matte, "Registration"].
[285] *Convention on Civil Aviation*, 7 December 1944, 15 U.N.T.S. 295 (entered into force 4 April 1947) Article 19 [Chicago Convention] (for aircrafts) and *United Nations Convention on the Law of the Sea*, 9 December 1982, 1833 UNTS 3, 21 ILM 1261, Article 91 [UNCLOS] (for ships)
[286] *See* Sylvia Ospina, "Revisiting the Registration Convention: A proposal to meet the need to know 'what is up there'" in *Proceedings of the Forty-Third Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2000) 199 at 200; Sylvia Ospina, "The UNIDROIT Registration of Security Interests and the Registration Convention: Compatible/ Complementary or Contradictory" in *Proceedings of the Forty-Sixth Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2003) 464 at 466.

a) without a system of registration, it is not possible to identify the space object, which has caused damage, and thus, impute liability to it;[287]
b) a complete informative system of registration minimizes the likelihood of weapon of mass destruction being put on orbit[288] and
c) a registration system facilitates co-operation of several nations in tracking of a space object, which ensures that the tracking facilities are not overloaded.[289]

Many space objects have been and are being launched in the orbit around the earth, especially in the geostationary orbit which is congested and where the possibility of collision is becoming greater. Further, space activities have created a number of debris which may again collide with other space objects. The law of liability in outer space will be very hard to enforce without a proper system of registration of space objects.

A. UN GA Resolution 1721 of December 20, 1961

States understood the importance of registration in the very early stage of space exploration. The matter was brought to the UN within two years of the Sputnik launch. On 20 December 1961, the UN General Assembly passed the Resolution 1721[290] based on a draft Resolution proposed by Australia, Canada, Italy and the USA. The 1961 resolution calls upon the States to promptly furnish data about objects launched by them in the orbit or beyond to the COPUOS. The Resolution requests the Secretary General to maintain a public registry for such information furnished, though it does not indicate the details which are to be furnished. Pursuant to this resolution, a register has been kept by the Outer Space Affairs division of the UN Secretariat since 7 March 1962. The resolution does not talk about the maintenance of any national register. Since 1962, information regarding most launches were reported,[291] though the details of such information furnished varied considerably. However, it must be remembered that the

[287] Aldo Armando Cocca, "Registration of Space Objects" in N. Jasentuliyana & Roy S.K. Lee, eds, *Manual on Space Law* (New York: Oceana,1978) vol 1, 173 at 173. [Cocca, "Registration"].
[288] Isabella Henrietta Philepina Diederiks-Verschoor, *An Introduction to Space Law* (The Netherlands: Kluwer Law International, 2008) at 44.
[289] Cocca, "Registration", *supra* note 287 at 174.
[290] UN GA Res 1721, *supra* note 9 at 6.
[291] Schmidt-Tedd & Gerhard, " Registration Advantages", *supra* note 269 at 122.

1961 resolution is an UN General Assembly Resolution and having no binding force by itself, information submitted by States is on voluntary basis. It cannot be said that registration of space objects has become customary international law because several space objects are not registered by States.[292]

B. Article VIII of the Outer Space Treaty

As the 1961 Resolution was not found sufficient to address registration of space objects, later the concept was incorporated in the space treaties.

Article VIII of the Outer Space Treaty provides the following:

> 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... while in outer space or on a celestial body. Ownership of objects launched into outer space, including objects landed or constructed on a celestial body, and of their component parts, is not affected by their presence in outer space or on a celestial body or by their return to the Earth....

Article VIII almost reproduced Paragraph 7 of the Declaration of Legal Principles,[293] subject to some minor drafting changes.

As has been discussed earlier, under Article VI of the Outer Space Treaty, the States are responsible for national space activities of even their non-governmental entities. Under Article VI, a State is internationally responsible to ensure that non-governmental entities carry out their space activities according to the Outer Space Treaty, which includes Article VIII.[294]

1. "Jurisdiction and Control" and "Ownership"

According to Article VIII of Outer Space Treaty, space objects have a State of registry. The details of space objects are entered in the register of such State of registry.

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[292] *Ibid*.

[293] *Declaration of Legal Principles, supra* note 10, Principle 7 ("The State on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and any personnel thereon, while in outer space. Ownership of objects launched into outer space, and of their component parts, is not affected by their passage through outer space or by their return to the Earth. Such objects or component parts found beyond the limits of the State of registry shall be returned to that State, which shall furnish identifying data upon request prior to return.")

[294] Schmidt-Tedd & Gerhard, " Registration Advantages", *supra* note 269 at 126.

Such State retains jurisdiction and control over the space objects while they are in outer space and/or celestial bodies.

The States cannot have territorial sovereignty in outer space or on celestial bodies according to Article II of the Outer Space Treaty.[295] The jurisdiction that they exercise over the space objects in their registry is quasi-territorial in nature, like the jurisdiction that States have on their ships and aircrafts.[296] The Outer Space Treaty prohibits the exercise of national sovereignty in space environment, but not the exercise of national jurisdiction.[297]

Under general international law, States have quasi-territorial jurisdiction over ships and aircrafts by virtue of the nationality[298] which these objects acquire under domestic law. Nationality is acquired by the ships and aircrafts either for being registered in a State, as in most cases, or for being owned by nationals of a State (eg: British ships).[299] However, under Article VIII of Outer Space Treaty, space objects are not conferred with any nationality. The States, while drafting the Outer Space Treaty, deliberately left out the concept of nationality for fear of being held responsible for their registered space objects.[300] Also, many States were anxious that they would not be able to engage in space individually. The only way to be involved in space activities for them was via co-operation. The concept of nationality, as applicable to ships and aircrafts, may be difficult to apply in these cases.

Since space objects do not have nationality, it is important to register them. This allows State to exercise its jurisdiction and control over space objects outside its

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[295] *Outer Space Treaty*, *supra* note 11, Article II ("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 by any other means.")
[296] Cheng, *Studies, supra* note 118 at 467.See generally, N.C. Goldman & D.J. O' Donnell, "Revisiting the Outer Space Treaty: A re-examination of the sovereignty-jurisdiction compromise" in *Proceedings of the Fortieth Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1997) 316.
[297] Carl Quimby Christol, "The Natural Resources of the Moon: The Management Issue" in *Proceedings of the Forty-First Colloquium on Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 1998) 1.
[298] Cheng, *Studies, supra* note 118 at 477 (nationality is a special bond between a State and various objects of international law by which State treats latter as component of its national community.)
[299] Cheng, *Studies, supra* note 118 at 467.
[300] Larsen, "Draft", *supra* note 56 at 490.

territorial jurisdiction[301] because registration, not nationality, establishes the link between a State and its space objects.[302] Attribution of jurisdiction and control to the State of registry brings certainty in determination of applicable law and thereby encourages commerce.[303]

Also, launch of space objects into outer space, their presence in outer space and return to earth do not affect their ownership under Article VIII, despite the fact that space is not subject to "appropriation".[304]

2. State of Registry

The wordings of Article VIII "a State Party on whose registry" imply that it is talking about a national registry and not of international registration.[305] Also, the words "a State Party" suggest that there is only one State of registry for a space object. Similar language was used in the Declaration of Legal Principles. When States chose to import a similar language into Article VIII, they brought along several years of practice which indicated that there can be only one State of registry.[306] This has been further clarified in Article II of the Registration Convention, which will be dealt with later.[307]

> Article XI of the Outer Space Treaty contains a similar provision:
>
> In order to promote international cooperation in the peaceful exploration and use of outer space, States Parties to the Treaty conducting activities in outer space, including the Moon and other celestial bodies, agree to inform the Secretary General of the United Nations as well as the public and the international scientific community, to the greatest extent feasible and practicable, of the nature, conduct, locations and results of such activities. On receiving the said

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[301] Setsuko Aoki, " In search of the current legal status of registration of space objects" in *Proceedings of the International Institute of Space Law* " (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2010) at 2. [Aoki, "In Search"].
[302] Cheng, *Studies, supra* note 118 at 483; Herczeg, *supra* note 174 at 108; "Summary of discussion on Interpretation of the Space Treaty 1967" in *Proceedings of the Tenth Colloquium on the Law of Outer Space* (California, USA: The University of California School of Law, 1968) 114 at 116.
[303] Horl and Gungaphul, *supra* note 71.
[304] *Outer Space Treaty, supra* note 11, Article II.
[305] Herczeg, *supra* note 174 at 108.
[306] Larsen, "Draft", *supra* note 56 at 490; *See* Kay-Uwe Horl & Julian Hermida, "Change of Ownership, Change of Registry? Which objects to register, what data to be furnished, when and until when?"in *Proceedings of the Forty-Sixth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2003) 454 at 455.
[307] See part III.C.1 below.

information, the Secretary-General of the United Nations should be prepared to disseminate it immediately and effectively.

C. The Registration Convention

The Registration Convention elaborates on Article VIII of Outer Space Treaty. The Convention was commended for signature by the UN General Assembly on 26 November 1974 and entered into force in 1976.[308] Objectives of the Convention are clearly written in its preamble as given by the following:

(a) to make provision for registration of space objects by launching States;

(b) to provide a central register of space objects, established and maintained by United Nations on obligatory basis; and

(c) to provide additional means of identification of space objects.

The Registration Convention also strengthens the Liability Convention, by making it easier to identify the damage-causing space objects .

The Registration Convention defines 'State of Registry' as a launching State on whose registry a space object is carried in.[309] The definition of 'launching State' in Registration Convention[310] is same as that in Liability Convention and hence, same interpretation applies to the term in both the Conventions.[311]

1. National Registration

The Registration Convention, unlike UN GA Resolution 1721, provides for national registration under Article II (1) of the Convention.

> When a space object is launched into Earth orbit or beyond, the launching State shall register the space object by means of an entry in an appropriate registry

[308] In 1968, France submitted a Draft Convention Concerning the Registration of Objects launched into Space for the Exploration or Use of Outer Space to the Legal Sub-Committee of COPUOS. Apart from the French draft, Canada, too, had submitted a draft and Canada and France took constructive steps to combine their drafts which was considered by the Legal Sub-Committee's Working Group. In 1973, the USA too submitted a draft Convention. *See French Draft*, A/AC.105/C.2/L.45 (1968) reproduced in the *Report of the Legal SubCommittee on the Work of its 11th Session*, Annex II , UN Doc A/AC.105/101 (1972); Matte, "Registration", *supra* note 284 at 234, 235; A/AC.105/C.2/L.83 of April 4, 1972; A/AC.105/C.2/L.85 of March 19, 1973; A/AC.105/C.2/L.85 of March 19, 1973.

[309] Registration Convention, *supra* note 14, Article I(c).

[310] Registration Convention, *supra* note 14, Article I(a).

[311] Part II.B.2.a.i above.

> which it shall maintain. Each launching State shall inform the Secretary-General of the United Nations of the establishment of such a registry.

When the States establish national registry, they communicate the information to the UN in the form of *note verbale*, which is disseminated in the ST/SG/SER.E/INF. series.[312]

The Registration Convention clarifies what Article VIII of Outer Space Treaty already indicated- there is only *one* State of registry for one space object.[313] Article II (2) provides the following:

> 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 in accordance with paragraph 1 of this article, bearing in mind the provisions of article VIII of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, and without prejudice to appropriate agreements concluded or to be concluded among the launching States on jurisdiction and control over the space object and over any personnel thereof.

Thus, when there is more than one launching State, the Registration Convention gives flexibility to the States to decide which State among them will be the State of registry and hence, have jurisdiction and control over the space object. For example, Greece and Cyprus jointly decided that Greece would register the satellite HELLASSAT-2.[314]

Also, Article I(c) and Article II(1) of the Registration Convention mandate that only a launching State can be the State of registry. Article II(3) states that the contents of a national registry and the conditions under which it is maintained shall be determined by the State of registry.

Under Article VII of the Registration Convention, international intergovernmental organisations can become quasi-parties to the Convention by accepting the rights and obligations under the Convention. These inter-governmental organizations are entitled to have their own registers. However, such organisations have not been endowed with the capability to have jurisdiction and control over space objects, as this is the prerogative of

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[312] Niklas Hedman," The United Nations Register of Objects Launched into Outer Space" (Statement delivered at the UN/Thailand Workshop on Space Law, Bangkok, Thailand, 16-19 November 2010).
[313] Cocca, "Registration", *supra* note 287 at 174,180.
[314] *Note verbale dated 25 March 2004 from the Permanent Mission of Greece to the United Nations addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/446 (25 March 2004).

a sovereign State.[315] In cases where space objects are registered by such organisation, according to UN Legal Counsel, arrangements may be made by the organisation with one of its Member States to extend latter's jurisdiction and control over object registered.[316]

2. United Nations Register

In addition to domestic registers which determine the State of registry, Article III of the Registration Convention provides that "Secretary-General of the United Nations shall maintain a Register in which the information furnished in accordance with article IV shall be recorded." This UN Register was established for maintaining information received from Member States and inter-governmental organizations who have declared the acceptance of rights and obligations. This system of registration is mandatory for the parties to the Convention. Non-members continue to report their launches under UNGA Res 1721B voluntarily. Thus, United Nations maintains two complimentary registers.

a. Information to be submitted to the UN

Article IV requires the following information to be submitted by the State of registry to the Secretary-General of the UN as soon as practicable:

(*a*) Name of launching State or States;
(*b*) An appropriate designator of the space object or its registration number;
(*c*) Date and territory or location of launch;
(*d*) Basic orbital parameters, including:
    (i) Nodal period;
    (ii) Inclination;
    (iii) Apogee;
    (iv) Perigee;
(*e*) General function of the space object.[317]

The States agreed that these minimum eight items were sufficient for identification of space objects, without forcing the States to divulge information that they would be unwilling to disclose.[318] Besides, additional information about the space object may be

[315] *See* D.W. Bowett, "Jurisdiction: Changing Patterns of Authority over Activities and Resources" (1982) 53 Brit YB Int'l L 1; James Crawford, "The Criteria for Statehood in International Law" (1976-1977) 48 Brit YB Int'l L 108.
[316] Cheng, *Studies, supra* note 118 at 469.
[317] Registration Convention, *supra* note 14 , Article IV(1).
[318] Matte, "Registration", *supra* note 284 at 238.

given by States to the Secretary-General from time to time on voluntary basis.[319] Article IV(3) provides that the States of registry shall also notify the Secretary-General, to the greatest extent feasible and as soon as practicable, information about space objects regarding which information has been previously transmitted and which no longer exist in the Earth's orbit. Information is generally given by Permanent Missions of States to the Secretary General of UN in the format of *note verbale* or letter and information received is disseminated as a document in the ST/SG/SER.E/ series.[320] Information in the UN Register are maintained by the Office of Outer Space Affairs and are openly and fully accessible.[321] Intergovernmental organisations, which are quasi-parties to the Convention, too have to abide by these aforementioned rules.

b. Marking of satellites

A system of voluntary marking has been adopted. But, if a space object launched is marked with a designator or registration number, this information have to be communicated to Secretary-General by the State of Registry who shall record this notification in the Register.[322]

c. Space Monitoring and Tracking

There may be cases where application of the aforementioned provisions of the Registration Convention does not result in identification of the space object which has caused damage or which may be of hazardous or deleterious nature. In these cases, other State Parties, especially those having space monitoring and tracking facilities, shall respond to request by a State Party, made by itself or through Secretary General of UN for identification of the space object, under 'equitable and reasonable conditions' and subject to arrangement made by the concerned State Parties.[323] The party making the request shall "to the greatest extent feasible" submit information as to time, nature and circumstance giving rise to the request made.[324]

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[319] Registration Convention, *supra* note 14, Article IV(2).
[320] Hedman, *supra* note 312.
[321] Registration Convention, *supra* note 14, Article III (2).
[322] Registration Convention, *supra* note 14, Article V.
[323] Registration Convention, *supra* note 14, Article VI
[324] Registration Convention, *supra* note 14, Article VI

3. Unregistered satellites

Despite the space treaties on registration, several unregistered space objects exist. These unregistered objects reduce the utility of maintaining the UN Register of Objects Launched into Outer Space, as the important goal of the Convention if States furnish correct information on every single space object.[325] These unregistered space objects exist because many States are not parties to the Registration Convention.[326] As of 8 March 2013, only 61 States have acceded/ratified the Registration Convention, 4 States have signed it and 2 inter-governmental entities have declared their acceptance of the rights and obligations under the Convention.[327] Even some State Parties to the Registration Convention have not been registering all their satellites, especially those launched by private parties.[328] Another concern is that not all State Parties have set up national registries as required by Article II of the Registration Convention. For example, as of 1 January 2005, only 16 of the 45 State Parties had informed the UN Secretary General of establishment of national registries.[329]

In this light, it was recommended by the UN GA Res 62/101 that non-Party States should accede to the Registration Convention and till that time, they should submit information under UN GA Res 1721B.[330] Similarly, international intergovernmental organizations conducting space activities should declare their acceptance of the rights and obligations under the Registration.[331] In order to improve the practice of registering space objects, it has been recommended that the States should advice the launch service providers in its jurisdiction to encourage the owners/operator of a space object to register

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[325] *Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects*, GA Res 62/101, UNGAOR, 62nd Sess, UN Doc A/RES/62/101 (2008), preamble [UN GA Res 62/101]; *Registration of space objects: harmonization of practices, non-registration of space objects, transfer of ownership and registration/non-registration of "foreign" space objects*, UNGAOR, 2006, UN Doc A/AC.105/867 (Germany).
[326] *Registration Convention, supra* note 14, Article II and IV.
[327] "Status of International Agreements relating to Activities in Outer Space", online <http://www.oosa.unvienna.org/oosa/en/SpaceLaw/treatystatus/index.html>; *Accession by Lithuania to the Convention on Registration of Objects launched into Outer Space*, C.N.181.2013.TREATIES-XXIV.1 (Depository Notification) (8 Match 2013).
[328] UN GA Res 62/101, *supra* note 325; See generally Jonathan McDowell, "Adherence to the 1976 Convention on Registration of Objects launched into outer space"(2013), online < http://planet4589.org/space/un/un_paper1.html> (list of unregistered satellites).
[329] Schrogl & Hedman, *supra* note 4 at 146.
[330] UN GA Res 62/101, *supra* note 325, para 1(a).
[331] UN GA Res 62/101, *supra* note 325, para 1(b).

it.[332] In absence of an agreement between launching States for determination of the State of registry,[333] the State from whose territory or facility the space object was launched should contact the other launching States for making such agreement to decide on the State of registry.[334] It is relevant to mention here that the Russian Statute on Licensing Space Operations lists as a requirement of launching license, the applicant's guarantee that foreign space object launched by Russian launch facilities, will be entered in the register of the proprietor of the space object. [335] It has also been recommended that in joint launches of space objects, each of the space objects should be registered separately, and space objects should be included in the in the registry of the State responsible for the operation of the space object under article VI of the Outer Space Treaty.[336]

D. Problems of Registration in on-orbit satellite transfers

Can ownership of space objects can be changed while in space? Article VIII of the Outer Space Treaty provides that ownership of object is not affected by them being in outer space. On earth, such objects can be sold or bought and since the ownership is not changed by their presence in outer space, satellites can be transferred on-orbit.[337]

In Article VIII of the Outer Space Treaty, there is a very strong co-relation between the concepts 'registry', 'jurisdiction and control' and 'ownership.' This is to the extent that the State of registry is supposed to, and even obliged to, exercise jurisdiction and control over space object and unless contrary is shown, it should be logically deemed to be the State of the owner of space object.[338] However, in case of on-orbit sale of satellites, often the State of registry and State of nationality of the new owner are different. In that case, while transferee State has *de facto* jurisdiction and control,

[332] UN GA Res 62/101, *supra* note 325, para 3(d).
[333] *Registration Convention, supra* note 14, Article II(2).
[334] UN GA Res 62/101, *supra* note 325, para 3(b).
[335] Russian Federation, *Statute on Licensing Space Operations* (Federal Government Decree No. 104 of 2 February 1996), Article 5.
[336] UN GA Res 62/101, *supra* note 325, para 3(c).
[337] *See* Kerrest, "Transfer", *supra* note 62 at 4.
[338] von der Dunk, "Illogical Link", *supra* note 78 at 351.

including tracking and command system,[339] it does not have *de jure* jurisdiction and control because it is not the State of registry.

So, can the State of registry be changed in such cases? Nothing in the Registration Convention and the Outer Space Treaty prevents subsequent change in the State of registry.[340] The State of registry of previously UK registered satellites- Asiasat-1,[341] Asiasat-2,[342] APSTAR 1[343] and APSTAR 1A[344] was changed when Hong Kong was transferred to China from the UK. From 1 July 1997, the satellites were removed from the register of the UK and were entered into the register of China, which is now the State of registry.[345] This example shows that change in the State of registry is possible. Such change may be executed by an agreement regarding the same between launching States as contemplated under Article II(2).[346] However, such change must conform to the requirement of Article I(c) of the Registration Convention that the State of registry must be a launching State. As in the transfer of Asiasat I, Asiasat 2, APSTAR 1 and APSTAR 1A, in an on-orbit sale of satellites between two launching States, less legal complications are involved. As per Article VIII of the Outer Space Treaty and Article II of Registration Convention, with the change of State of registry, the jurisdiction and control over the satellites has also been transferred from the UK to China, the new State of Registry. The UK, being no more the State of registry, does not have jurisdiction and control over the satellites.

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[339] *See* Trögeler*, supra* note 31 at 6.
[340] Kerrest, "National Law", *supra* note 161; Kerrest, "Transfer", *supra* note 62 at 4; Cheng, *Studies, supra* note 118 at 473.
[341] *Note Verbale dated 15th May 1990 from the Permanent Representative of the United Kingdom of Great Britain and Northern Ireland addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/222 (29 August 1990).
[342] *Note verbale dated 23 January 1996 from the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland to the United Nations (Vienna) addressed to the Secretary-General*, UNGA, UN Doc ST/SG/SER.E/300 (1 February 1996).
[343] *Ibid.*
[344] *Letter dated 21 October 1996 from the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland to the United Nations (Vienna),* UNGAOR, UN Doc ST/SG/SER.E/316 (31 October 1996).
[345] *Note verbale dated 27 March 1998 from the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland to the United Nations (Vienna) addressed to the Secretary-General*, UNSECRETARIATOR, UN Doc ST/SG/SER.E/333 (3 April 1998); *Note verbale dated 27 March 1998 from the Permanent Mission of China to the United Nations (Vienna) addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/334 (3 April 1998).
[346] *See* Trögeler, *supra* note 31 at 6.

In another case, acquisition of MSC (Phillipines) by ABS (China) caused satellite Agila-2 to be transferred between two launching States. According to the UN registry, no transfer of registration has taken place. However, if change of registration was made, China, being a launching State, would have fulfilled the conditions for being the State of registry as defined in the Registration Convention. Consequently, it could have had jurisdiction and control that State of registry has as per Article VIII of the Outer Space Treaty.

Legal difficulty arises when the sale is between a launching and a non-launching State. The new transferee cannot become a State of registry as Registration Convention provides that only a launching State can be a State of registry.[347] Some non-launching States, which later became transferee of an on-orbit satellite transfer, have taken advantage of this lacunae and have not furnished information regarding the transfer to the UN.

The case of the NSS satellites of the Netherlands makes an interesting study. The Dutch government asserts that it does not consider itself launching State, State of Registry or launching authority for these satellites, some of which were delivered-in-orbits and some transferred on-orbit.[348] The Netherlands at the same time claims that:

> Following the transfer in orbit of ownership of the space objects to New Skies Satellites, the Kingdom of the Netherlands is of the opinion that it bears international responsibility for their operation in accordance with article VI and has jurisdiction and control over them in accordance with article VIII of the Outer Space Treaty.'[349]

It is not possible for the Netherlands to not be State of Registry yet to have jurisdiction and control under Article VIII. From international perspective and at least among State Parties to the Outer Space Treaty and the Registration Convention, no jurisdiction and control over a space object is feasible without national registration. Control should be based on legitimate jurisdiction and should not depend on factual and technical

[347] See Schmidt-Tedd & Gerhard, " Registration Advantages", *supra* note 269 at 131; Kerrest, "Remarks", *supra* note 22 at 309; Bernhard Schmidt-Tedd & Michael Gerhard, "How to Adapt The Present Regime for Registration of Space Objects to New Developments in Space Applications?" in *Proceedings of the Forty-Sixth Colloquium on the Law of Outer Space* (Washington D.C., USA: American Institute of Aeronautics and Astronautics, 2005) 353 at 357.
[348] *Note verbale Netherlands,* 2003, *supra* note 168; *Note verbale Netherlands,* 2004, *supra* note 168.
[349] *Ibid.*

capabilities only.[350] This can be explained by drawing rationale from the *Barcelona Traction Case.*[351] Barcelona Traction Power and Light Company was incorporated in Toronto, Canada where it also had its head office. Its assets were expropriated by Spain. In that case, the Court held that Belgium lacked *locus standi* to bring a claim on behalf of Belgium shareholders, who owned most of the shares of the Barcelona Traction Power and Light Company, since the company was incorporated in Canada. Thus, the Court found that the legal basis by which Canada was identified with the company as important and held that "disregarding the legal entity" of company was allowed only in exceptional circumstances.[352] The reason given was "the incorporation of the company under the law of Canada was an act of free choice... this connection is in no way weakened by the fact that the company engaged from the very outset in commercial activities outside Canada."[353] Similarly, under space law, it is the State of registry which has jurisdiction and control. This link is established by law due to registration and should be given importance. The Netherlands cannot claim to have *de jure* jurisdiction and control just because it is in actual control of satellites, unless it becomes the State of Registry. Incidentally, the satellites purchased while on-orbit were erstwhile INTELSAT satellites which had not been registered earlier.[354] It is doubtful whether the Netherlands can register these satellites as it is not an original launching State for these satellites. For the cases of NSS6 and NSS7, however, the Netherlands is one of the launching States.[355] Hence, there is no restriction on it being 'State of Registry' under Article II and Article 1(c) of the Registration Convention for NSS6 and NSS7.

In 2009, the Netherlands furnished information about establishment of two kinds of registry: a) the United Nations Sub-Registry, which will be used when the Netherlands is a State of Registry because it is a launching State, and (b) the National Sub-Registry, which will be used when the Netherlands is not a launching State or State or Registry but

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[350] Stephen Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl, eds, *Cologne Commentary on Space Law,* vol 1 (Cologne: Carl Heymanns Verlag, 2010) at 152.
[351] *Barcelona Traction, Light and Power Co (Second Phase) (Belg. v. Spain)* [1970] ICJ Rep 3 [*Barcelona Traction*].
[352] *Barcelona Traction*, *supra* note 351 at 39.
[353] *Ibid* at 43.
[354] INTELSAT had not declared acceptance of rights and obligations under the Registration Convention as an intergovernmental body.
[355] See text accompanying notes 265-269.

has jurisdiction and control.[356] Thus, the Netherlands continues to have the same restrictive view.

Another interesting case is that of the UK's registration of erstwhile INMARSAT satellites. In 2002, the UK furnished information to the UN, in accordance with Article XI of the Outer Space Treaty and Article IV of the Registration Convention, about the change of status of eight erstwhile INMARSAT satellites (I2-F2, I2-F3, I2-F4, I3-F1, I3-F2, I3-F3, I3-F4, and I3-F5) after INMARSAT's privatisation and its incorporation in the UK.[357] Although the UK acknowledges the existence of these satellites, it asserts that it is not the State of registry or the launching State.[358] But, as Inmarsat is now incorporated in the UK, clearly the *de facto* control over the satellites lies in the hands of the UK. Again, an inequitable situation arises because of the current regime of international space law. According to Aoki, by furnishing information to the UN Secretary General about the satellites owned and operated by its nationals, the UK follows the logic of Dutch practice and implicitly claims that it has jurisdiction and control over the eight satellites.[359]

Similar problems arise in leases and other transfers of control and operation of on-orbit satellites between States. A notable exception on this is the case of transfer of BSB-1A satellite where a non-launching State informed the UN about its purchase of BSB-1A. The BSB-1A was registered in the UK registry[360] and later, it was purchased while on-orbit by a Swedish entity, even though Sweden was not a launching State. The satellite is still in the UK Registry with the explanation that "notified UN on 1 February 1999 that title and control of the satellite had been transferred to a Swedish national… Now operated as SIRIUS and carried on Swedish Registry."[361] The State of registry was

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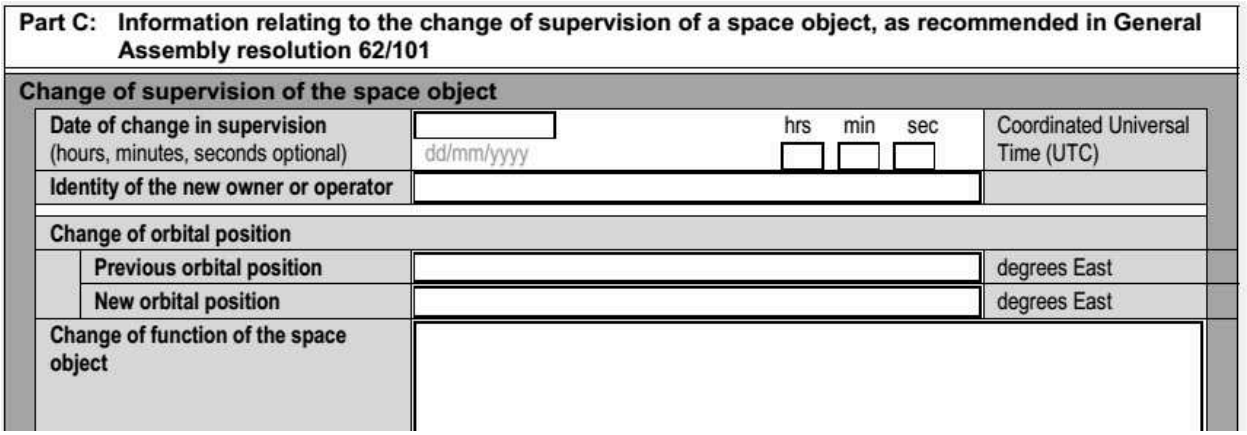
[356] *Note verbale dated 3 June 2009 from the Permanent Mission of the Netherlands to the United Nations (Vienna) addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/INF.24 (20 Aug 2009) at 1-2.
[357] *Note verbale UK 2002*, *supra* note 257.
[358] *Ibid*.
[359] Aoki, " In Search", *supra* note 301 at 250.
[360] *Note verbale dated 12 April 1990 from the Permanent Mission of the United Kingdom of Great Britain and Northern Ireland addressed to the Secretary General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/219, (24 April 1990).
[361] Trogeler, *supra* note 31 at 7.

changed to Sweden and Sweden notified the same to the UN.[362] It is doubtful, however, whether such an act is permissible because the Registration Convention does not allow non-launching States to become the State of registry. In any case, if Sweden is a State of registry, it implies that Sweden has assumed the status of a launching State because Article 1(c) of the Registration Convention states that only launching States can be the State of registry. Hence, Sweden should be liable under the Liability Convention for any damage caused by the satellite.

Registration of BSB-1A by Sweden, though an irregularity, is a desired practice. In order to bring in efficiency, certainty and uniformity in the procedure of registration, the least the information about the on-orbit satellite transfer, irrespective of whether the transferee is launching or non-launching State, should be given to the UN on a voluntary basis.[363] UN GA Resolution 62/101 elaborates on this matter and states that in case of change in supervision of a space object while in orbit, the State of registry, in cooperation with appropriate State, should furnish additional information to the UN Secretary General regarding: the date of change in supervision, the identification of the new owner or operator, any change of orbital position and/or any change of function of space object.[364] If there is no State of registry, the appropriate State should furnish the abovementioned information to the Secretary General of UN.[365] As suggested by the resolution,[366] changes have been made to the UN's Model Registration Information Submission Form:

[362] *Note verbale dated 1 February 1999 from the Permanent Mission of Sweden to the United Nations (Vienna) addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/352 (19 February 1999).
[363] UN GA Res 59/115*, supra* note 169; UN GA Res 62/101, *supra* note 325.
[364] UN GA Res 62/101, *supra* note 325, para 4 (a).
[365] UN GA Res 62/101, *supra* note 325*,* para 4(b).
[366] UN GA Res 62/101, *supra* note 325*,* para 5(a).



Part C: Information relating to the change of supervision of a space object, as recommended in General Assembly resolution 62/101

Change of supervision of the space object

Date of change in supervision (hours, minutes, seconds optional)	dd/mm/yyyy hrs min sec	Coordinated Universal Time (UTC)
Identity of the new owner or operator		
Change of orbital position		
Previous orbital position		degrees East
New orbital position		degrees East
Change of function of the space object		

This, however, is not the current practice of the States who do not report about transfer of on-orbit satellites to the UN.[367] Not only does the international law provide impediment for registering the transferee as the State of registry, the States have been confused, lackadaisical or reluctant on submitting information about on-orbit satellite transfers.[368] In addition, to the above-mentioned examples, there are some more instances where information about transfer of satellite was not furnished to the UN. Canadian Telesat's Anik was bought by an Argentine entity, which had factual control over Anik, but the State of registry (Canada) was not changed.[369] In another case, the satellites Koreasat-2, registered by Republic of Korea,[370] and Koreasat-3, not registered according to UN procedures,[371] were sold to an entity in China, a non-launching State. The sales were, however, not accompanied by a change of control or change in the State of registry.

[367] Schrogl & Hedman, *supra* note 4 at 147.
[368] See generally, McDowell, *supra* note 328.
[369] *Note Verbale dated 6 February 1987 from the permanent Mission of Canada to the United Nations addressed to the Secretary General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/156 (13 February 1987).
[370] *Note verbale dated 11 March 1996 from the Permanent Mission of the Republic of Korea to the United Nations (Vienna) addressed to the Secretary-General,* UNSECRETARIATOR, UN Doc ST/SG/SER.E/304 (19 March 1996).
[371] Aoki, "Satellite Ownership", *supra* note 82 at 8.

III. OTHER ISSUES ON ON-ORBIT SATELLITE TRANSFER

A. Return of Satellites

On-orbit satellite transfers also raise questions on the State to which found satellites or their components are to be returned. According to the Outer Space Treaty, the discovered satellites or component parts are to be returned to the State of registry[372] and according to the Rescue Agreement, to the launching authority.[373] However, the transferee State of an on-orbit transfer, which often has the actual control and interest in the satellite or its components, may not be either the State of registry or the launching authority. This creates problems because if they do not have control or interest over the satellite, the State of registry and the launching authority may not be interested in carrying out the duties assigned to them under the space treaties. Also, the State of registry and the launching authority, if they are not in actual control of the satellite, may not have sufficient information to fulfil their obligations under the space law treaties. For example, under the Outer Space Treaty, the State of registry may be asked to furnish identifying data, prior to return of space objects or their components.[374] However, the State of registry, as it is not actually operating the satellite and has no control over the satellite, may neither be interested nor in position to furnish necessary identifying data. The transferee State, which may be interested in obtaining the found satellite or its parts, will find it difficult to obtain it.

Rescue Agreement develops upon and gives further expression to the duties laid down in the Outer Space Treaty, for both launching authority and other State Parties. The Rescue Agreement departs from the notion of State of registry of the Outer Space Treaty and dispenses with link between the State of registry and return of found space objects.[375] The States Parties of Rescue Agreement owe the obligation to return space objects to the launching authority[376] which has been defined as the State or international organization

[372] *Outer Space Treaty, supra* note 11, Article VIII.
[373] *Rescue Agreement, supra* note 12.
[374] *Outer Space Treaty, supra* note 11, Article VIII.
[375] Cheng, *Studies, supra* note 118 at 280.
[376] *Rescue Agreement, supra* note 12, Article V.

responsible for launching.[377] However, the Rescue Agreement fails to clarify what is meant by 'responsible'. This brings in confusion about who are launching authorities, just like the ambiguity on the concept of 'launching State' in Liability Convention and Registration Convention. Hence, the Netherlands, though it procured in-orbit delivery of NSS-6 and NSS-7 satellites, asserts that it is not a launching authority for these satellites.[378]

Under Rescue Agreement, the States Parties are required to notify the launching authority and Secretary-General of the UN, if they discover or receive information that a space object has returned to earth.[379] The space object or component parts may land in the territory under a State's jurisdiction, on the high seas or in any other place not under the jurisdiction of any State.[380] The place where the space object has landed makes no difference to the obligation to notify.[381] It may be noted here that the duty of notification arises only when space object "has returned to Earth."[382] This duty had not been imposed by the Outer Space Treaty. Furthermore, if it is requested to do so by the launching authority, the Rescue Agreement requires the State Party, in whose territory the space object has been discovered, to take practicable steps to recover the space object.[383] The launching authority has to provide assistance in the recovery if the State, in whose jurisdiction the space object is discovered, so requests.[384] Objects, which are found beyond territorial limits of launching authority, are to be returned to launching authority if it so requests.[385] Thus, unlike in Outer Space Treaty, duty to return is contingent upon request from launching authority.[386] After an on-orbit transfer of satellite, the transferor State may not request for recovery or in case it requests, provide assistance in recovery since it has no interest in the space object. Transferee, not being the launching authority,

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[377] *Rescue Agreement, supra* note 12, Article VI
[378] *Note verbale Netherlands,* 2003, *supra* note 168.
[379] *Rescue Agreement, supra* note 12, Article V(1).
[380] *Rescue Agreement, supra* note 12, Article V(1).
[381] *See* Roy S.K. Lee, "Agreement on the Rescue of Astronauts, he Return of Astronauts and the Return of Objects Launched into Outer Space" in N. Jasentuliyana & Roy S.K. Lee, eds, *Manual on Space Law* (New York: Oceana, 1978) vol 1, 53 at 63.
[382] *Ibid* at 63.
[383] *Rescue Agreement, supra* note 12, Article V(2);
[384] *Rescue Agreement, supra* note 12, Article V(2).
[385] *Rescue Agreement, supra* note 12, Article V(3).
[386] Paul G. Dembling, "The Treaty on Rescue and Return of Astronauts and Space Objects", (1968) 9 Wm & Mary L Rev 630 at 654; Cheng, *Studies, supra* note 118 at 279.

cannot make request for recovery of the object. Furthermore, there may be cases where the State, in whose territory space object is found, has reason to believe that the object is hazardous or deleterious in nature. That State may notify this to the launching authority who is obligated to immediately take effective steps to eliminate possible danger of harm, under direction and control of the State having territorial jurisdiction.[387] Also, launching authority has to pay for expenses incurred for recovery of space objects by other States.[388] It is, however, onerous to impose these duties for recovery of a satellite on a transferor State which is no longer operating it, merely because the State is the launching authority. The transferee, on the other hand, not being the launching authority, despite having control over operation of satellite prior to their return, will not have any obligation. In fact, certain States like the Netherlands, whose entity purchased certain INTELSAT satellites on-orbit, and the UK, whose national gained control over satellites due to privatization of intergovernmental INMARSAT, have clearly declared that they cannot be deemed 'launching authority' for satellites in whose launch they have had no involvement.[389]

The issue of return of satellite, however, is not important. On re-entering Earth's atmosphere, generally, a satellite either burns up completely or at least, disintegrates.[390] Hence, a satellite or its component part on return to Earth becomes commercially non-viable. In most cases, the responsible State may not be interested in recovery of its satellites. For example, in the case of accident of the USSR's Cosmos 954, the satellite, while entering the Earth's atmosphere, burned up, disintegrated and parts of it crashed on north Canada. Soviet Union did not request the return of the debris of the Cosmos 954.[391]

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[387] *Rescue Agreement, supra* note 12, Article V(4).
[388] *Rescue Agreement, supra* note 12, Article V(5).
[389] *Note verbale Netherlands,* 2004, *supra* note 168; *Note verbale UK 2002*, *supra* note 257.
[390] S. E. Doyle, "Reentering Space Objects: Facts and Fiction", (1978) 6:2 J Sp L 107 at 109, 116; US Senate Report, *The Convention on International Liability for Damage Caused by Space Objects Launched into Outer Space: Analysis and Background Data*, 92d Cong., 2d Sess. 6 (1972).
[391] Peter P. C. Haanappel, " Some Observations on the Crash of Cosmos 954", (1978) 6:2 J Sp L 147 at 148; Paul G. Dembling, "Cosmos 954 and The Space Treaties" (1978) 6:2 J Sp L 129 at 132.

B. National Barriers to on-orbit transfer

In addition to problems posed by international space law, there are other barriers to on-orbit satellite transfers which are imposed by national laws. This sub-chapter points out the important questions that these barriers raise but these problems will not be dealt with in detail in this thesis.

One barrier is the caps and conditions for foreign investment in different sectors imposed by the States. For example, in India, foreign direct investment in establishment and operation of satellites can be done only through government route and subject to any guidelines laid down by ISRO.[392] Such caps and conditions create barriers when on-orbit satellite transfers occur due to acquisition of a company providing satellite services such as telecommunication or any other entity in control and operation of satellite/s. Foreign Investment policies and laws of certain States also put nationality or residency requirements for directors of companies.[393]

Another legal issue to be faced in case of acquisition of a company, owning satellites, is the national law on corporations and regulating securities market.

Export control laws of countries is another legal barrier which substantially restricts feasibility of on-orbit satellite transfer. This is elaborated briefly in next sub-chapter.

C. Export Control Laws

Export control laws put restrictions on transfer of satellites, especially to certain States and on re-export to these States. Laws on export control of goods and services are generally passed by legislators because of national security reasons. They are aimed at curbing proliferation of weapons and technology having military use. Export means transfer of anything to a foreign State by any means, anywhere, anytime, or the

[392] Department of Industrial Policy and Promotion, Ministry of Commerce and Industry, Government of India, *Consolidated FDI Policy* (Effective from April 5 2013).
[393] Ronald Hirshhorn, "Formal And Informal Barriers To Foreign Direct Investment In The Telecom Sector" in Working Paper Series (Canada: Industry Canada, 2008-07) at 2,4.

knowledge that goods and services, being transferred to a national, may further be transferred to a foreign person.[394]

Transfer of satellites is subject to export control laws because technology used in satellites and component parts of satellites have dual use. A sophisticated spacecraft system may include computer software and hardware, propulsion technology to keep satellite on station and remote sensing technology, which may be threat to national security of a State.

1. The USA

The USA has been historically the most influential player in the field of satellite manufacturing and launch services. Hence, it is imperative to look into export control laws of the USA. The USA Government controls exports of sensitive equipment, software and technology in order to promote its national security interests and foreign policy objectives, to prevent proliferation of weapons and technologies, including weapons of mass destruction, to problem end-users and supporters of international terrorism.[395]

The President of USA is authorized to control the export of defense articles and services by section 38 of the Arms Export Control Act (AECA).[396] This Presidential authority has been delegated to the Directorate of Defense Trade Controls (DDTC) within the Department of State. The AECA gives the government the power to control export of goods, services and technical data to other nations. The International Traffic in Arms Regulations (ITAR) was promulgated by Department of State to implement the AECA.[397]

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[394] Bob Tucker for NASA Office of International and Interagency Relations, "U.S. Export Control Laws And Regulations ", online: <https://www.google.ca/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0CD0QFjAB&url=http%3A%2F%2Foiir.hq.nasa.gov%2Fnasaecp%2FWebbrfg%2Fwebbrfg.ppt&ei=Vs71UYK1Kon_qwG2-YBI&usg=AFQjCNEBLZoGY3OiEmuDutdC956OVIj3lQ&sig2=vxD-eWy6gSckLlzWfdhgYA>.

[395] A Resource on Strategic Trade Management and Export Controls, <http://www.state.gov/strategictrade/overview/>.

[396] 22 U.S.C. § 2778 (2007).

[397] 22 C.F.R. § 120.1(a)

Under ITAR, the Department of State, in concurrence with the Department of Defense,[398] designates the United States Munitions List (USML).[399] This list is used to identify defense products or services, which are subject to export controls.[400] Export of an article, identified in the list, is regulated by the Department of State.[401] The designations are made primarily on the basis whether the article or service are deemed to be inherently military or has predominant military application.[402] The munitions list may include satellites, its equipments and technical data in equipments and there are prohibitions of them being exported.[403] Among other things, the ITAR prohibits disclosure or transfer to foreign persons, without prior approval of the DDTC, of technical data (such as information necessary for design, development, operation and repair) about any defense article on the USA Munitions List and furnishing to foreign persons of any defense services which includes assistance with regards to a defense article.[404]

Export under the ITAR is possible, if the foreign State meets certain requirements, such as, establishing an export control regime that is comparable to the USA regime. The foreign country should also share export-import documentation with the USA law enforcement agencies and not re-export articles and services in munitions list to proscribed countries.[405] ITAR approval is needed at almost every step of the export process "including being able to discuss technical performance details with the customer, obtaining insurance for a satellite . . . , exporting a satellite to a launch base, and being able to talk to ground operators for help with flying the spacecraft."[406] As K.R. Sridhara Murthy, former Executive Director of Antrix Corp Ltd., the commercial arm of the

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[398] 22 C.F.R. § 120.2.
[399] 22 C.F.R. § 120.3(b)
[400] 22 C.F.R. § 120.2.
[401] 22 C.F.R. § 120.5.
[402] van Fenema, *supra* note 271 at 111.
[403] 22 C.F.R. § 121.1 and § 126.1
[404] Raymond G. Bender, "Conducting Satellite Industry Arbitrations Under The Watchful Eye Of The International traffic In Arms Regulations" in Thomas C. Carbonneau & Jeanette A. Jaeggi, eds, *American Arbitration Association's Handbook on International Arbitration & ADR* (New York: JurisNet, 2006) 121 at 122-123.
[405] P.J. Blount, "The ITAR Treaty And Its Implications For U.S. Space Exploration Policy And The Commercial Space Industry", (2008) 73 J. Air L & Com. 705 at 715-716.
[406] Ryan Zelnio, "The Effects of Export Control on the Space Industry", *Space Rev*, (2006), online: <http://www.thespacereview.com/article/533/1>.

ISRO, stated that, "ITAR is the most challenging and difficult regulation we have to contend with."[407]

The Department of Commerce, through the Bureau of Industry and Security, administers the Export Administration Regulations (EAR) in order to control dual-use and commercial items, including those identified in the Commerce Control List (CCL). This list, too, includes several items which may be in a space object, such as, sensors, avionics, computers and navigation. The Commerce Department is endowed with the duty to ensure that any dual-use technology or equipment is not exported from USA to a potential adversary and that such transfers are not made under the guise of civilian projects.[408] EAR, too, has detailed licensing procedure.

The fundamental difference these two Departments- DOC and DOS lies in their purposes. Whereas DOC's role is to promote USA's business interests abroad, DOS's task is to ensure that sensitive USA technology is not proliferated around the world.[409] The EAR presumes that items will be approved for trade, unless country or recipient involved is red-flagged, while ITAR has a presumption of denial unless the export is in the foreign policy interest of the USA.[410] Also, the licensing system of DOC is much less complex and speedier.

In 1996, commercial communication satellites and related components were transferred to DOC jurisdiction. But, soon after this, there was the launch failure of the Chinese Long March 3B rocket carrying the USA built Intelsat 708 satellite which was followed by the Cox Report. According to the Cox Report, satellite technology information transferred to China compromised national security and improved reliability of Chinese inter-continental ballistic missile (ICBM). Hence, commercial communication satellites and all related equipment were transferred back on the USML on 15 March

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[407] "U.S. Regulations Restrict Space Industry Growth", *India PRwire* (27 September 2007), <http://www.indiaprwire.com/businessnews/20070927/24683.htm>.
[408] van Fenema, *supra* note 271 at 120.
[409] Ryan J. Zelnio, "Determining the Effects of ITAR Regulation on the Commercial Space Manufacturing Sector", online: *<http://www. cspo. org/igscdocs/Ryan% 20Zelnio. pdf>*; Blount, *supra* note 405 at 710; Interview of Patricia Cooper by WorldECT in "Talking export controls with Patricia Cooper", online: WorldECR <http://www.sia.org/wp-content/uploads/2013/04/WorldECR-issue-20-201303-PC-Article-p14.pdf> [Interview of Patricia Cooper].
[410] Interview of Patricia Cooper, *supra* note 409.

1999 pursuant to the Strom Thurmond National Defense Authorization Act of 1999 and the regime became restrictive again.

Furthermore, the USA has restrictions on remote sensing satellites. Under the 1992 Land Remote Sensing Policy Act and the 2000 Regulations Relating to the Licensing of Private Land Remote-Sensing Space Systems, the USA can exercise control over the operation of a foreign remote-sensing satellite and can limit the collection or distribution of data by a satellite launched by an American launch company.[411]

The trade-restrictive export control laws have compliance costs.[412] Companies in the USA indicated that the USA export control laws are primary barrier to selling in foreign markets.[413] This has put serious competitive disadvantages on the USA's manufacturing companies[414] because the USA national satellite manufacturers derive substantial revenue from foreign customers and these foreign customers may wish to use foreign launch systems which may be cheaper or better scheduled to meet launch deadline.[415] Because of the restrictive laws, USA domestic satellite manufacturers lost out on such customers, besides losing customers from the proscribed countries. The restrictive regime also encouraged other States to develop indigenous technologies, thus bringing in competition for the USA manufacturers. The complexity of ITAR has induced foreign buyers to go to other sellers who produce ITAR free satellites and ITARFree has become a business strategy, supported by European Union. For example, the European Space Agency has directed European companies to find non-USA sources for space products and has funded development of competing products to avoid ITAR requirements.[416] Though, officially, ITAR restriction was to maintain national security and world peace, it has been used by the USA to maintain its hegemony in satellite

[411] Ram Jakhu, "Legal Issues Relating to the Global Public Interest in Outer Space" (2006) 32:1 J Sp L 31 at 58. [Jakhu, "Legal Issues"]
[412] *Defense Industrial Base Assessment: U.S. Space Industry* , Final Report (Dayton, Ohio, 31 August 2007) at 35 (export control compliance costs averaged $49M/year industry-wide. Compliance costs grew 37% during the 2003–2006 period, with the burden of compliance significantly higher for firms in the lower tiers).
[413] *Ibid* at 14.
[414] Elizabeth Seebode Waldrop, "Integration of Military and Civilian Space Assets: Legal and National Security Implications", (2004) 55 AFL Rev 157 at 194; Blount, *supra* note 405 at 711
[415] Bender, *Launching, supra* note 42 at 83.
[416] *Ibid* at 37.

manufacturing (also launch service) market, an objective which has backfired.[417] Thus, the USA is losing its share in satellite manufacturing, potentially harming domestic innovation processes[418] and is facing tough competition from Europe and Asia-Pacific Region where the export control laws are not as restrictive. There is a noticeable disconnect between USA's policy of encouraging the space industry and the commercial reality where satellite trade is restricted by ITAR, and the balancing task is complicated.[419]

To address the difficulties faced by satellite manufacturers, National Defense Authorization Act for Fiscal Year (NDAA) 2013 was enacted. Its effect was to reverse the Storm Thurmond Act and commercial communications satellites were brought to DOC (CCL) from DOS (USML). However, even under NDAA 2013, there are restrictions on transfer satellite component or technology to several countries, such as, China, Cuba, Iran, North Korea, Sudan and Syria. Undoubtedly NDAA 2013 is a commendable effort which has relaxed restrictions, improved the situation for satellite manufacturers and eased trade in satellites.[420]

2. CoCom and Wassenaar Arrangement

Other countries, too, have export control laws for both munitions and dual-use items, though their laws are generally less restrictive than the USA's, especially with respect of re-export restrictions. In 1949, the Co-ordination Committee for Multilateral Export Controls (CoCom) was established as the western countries felt the need to ensure that certain strategically important goods and equipment should not fall into the hands of Soviet Union and their allies. On 12-13 July 1996 in Vienna, a new arrangement, the Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods

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[417] See generally, Jakhu, "Legal Issues", *supra* note 411.
[418] "ITAR and the U.S. Space Industry", *Space Foundation*, online: <http://www.spacefoundation.org/docs/SpaceFoundation_ITAR.pdf>.
[419] Waldrop, *supra* note 414 at 158, 176; Blount, *supra* note 405 at 711.
[420] *See* Harrison G. Wolf, "ITAR Reforms for Dual-Use Technologies: A Case Analysis and Policy Outline", online: <http://viterbi.usc.edu/aviation/assets/002/79883.pdf>; Nancy A. Fischer and Aaron R. Hutman, "U.S. Congress Authorizes Satellite Export Control Reform", *Pillsbury (*21 December 2012).

and Technologies,[421] was officially established as the successor to CoCom. In the Arrangement, the list of restricted technologies is broken into two parts, the List of Dual-Use Goods and Technologies (also known as the Basic List) and the Munitions List. The Basic List has two further classifications: Sensitive and Very Sensitive. Space related activities like communications, navigation and avionics, sensors and lasers are dealt with by the Arrangement. The final decision regarding transfer of any item is the sole responsibility of each Participating State. The Arrangement is not a treaty and has no binding value. All measures with respect to the Arrangement are taken in accordance with national legislation and policies and are implemented on the basis of national discretion.[422]

3. Europe

Among Member States of European Union (EU), the circulation of goods and people has been free since 1993. However, in order to respect the international commitments of the EU and its Members and to avoid the proliferation of nuclear, chemical, biological, and ballistic arms, the export of dual-use items is still subject to control. Export control of dual-use goods and technology in Europe is regulated by the EC Regulation No 428/2009,[423] which sets up a Community regime for the control of exports, transfer, brokering and transit of dual-use items and technologies. It entered into force on 27 August 2009, replacing the earlier Regulation 1334/2000. The Regulation states that in addition to the dual-use items listed in Annex I to the Regulation, Article 4 known as the "catch-all clause" requires authorization for exports of items which are or may be intended for use in connection with weapons of mass destruction, as well as, conventional arms if these are to be exported to destinations under an arms embargo. The Regulation creates a Community General Export Authorization[424] for all, except the most sensitive listed dual-use items, for seven like-minded third countries. In cases of all other exports which require authorization, the Regulation leaves it on the national authorities to

[421] *The Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies*, July 11-12, 1996 [Arrangement].
[422] Wassenaar Arrangement on Export Controls for Conventional Arms and Dual-Use Goods and Technologies, <http://www.wassenaar.org/introduction/>.
[423] The Regulation has been last updated on April 19, 2012 by the Council Regulation (EC) No 388/2012.
[424] EC Regulation No 428/2009, Article 9(1) and Annex II

make the final decision about whether to grant a national, global or individual export license.[425] Thus, the Regulation strikes a balance between the Community competence and the legitimate concerns of Member States to remain in control of matters of national security.

4. Restrictions on Satellite Transfer on-orbit due to export control laws

Export restrictions must be closely considered before a deal on transfer of satellite is struck . The restrictions on re-export must be kept in mind. For example, if a satellite, owned by a Canadian entity, has an USA equipment that falls under Munition List, Canada cannot sell, lease or in any way transfer the satellite to a State in the proscribed list like Iran.[426] In another situation, Canada engages in a space activity with secured financing and a satellite, manufactured by the USA or using the USA's technology, is secured. If the financier is from Pakistan or any country in proscribed list, it cannot take possession of the satellite. Also, if the financier is from a safe country like Canada, after it takes possession of the satellite, the financier cannot transfer it to a State which is on proscribed list. This means ITARFree satellites will have more fungibility in the market and can be transferred and retransferred as many times possible.

In this way, export control laws can put serious hindrance to an on-orbit transfer of satellites between States and States with less stricter export control law can be more engaged in such transfers.

[425] EC Regulation No 428/2009, Article 9(2).

[426] If a country appears on this list, it is (generally) USA's policy to deny licenses, or other approvals, associated with exports and imports of defense articles and defense services, destined for or originating in that country, 22 CFR 126.1.

IV. SOLUTIONS

The present chapter will try to find solutions for the inconsistencies that arise in case of an on-orbit transfer of satellites under international space law only and not those created by national laws, such as, export control laws. However, restrictions put by national laws should be relaxed by the concerned States to encourage transfer of satellites.

As Kerrest succinctly narrates, under the present regime of international space law, after transfer of satellite on-orbit, there may be a liable State having jurisdiction and control of the space object, that it cannot control and for which another State is responsible because it is that State's national activity.[427]

A. Factors to consider for solution

Certain factors should be kept in mind in order to reach a solution:

a) Interests of the victim: The space law regime, especially the Liability Convention, is victim-oriented. Launching State/s are being held liable because launching is a hazardous activity. The solution reached should not impede the interests of the victims. A solution, in which liability is on the State-in-charge of the space activity, will have a preventive effect and will better protect the victim. If a State is held liable for its activities, it will have strict standards and will exercise due care and prudence.

b) Interests of the transferor (original launching State): The transferor should be allowed to denounce its status and obligations as launching State, once the transfer takes place. This is the central issue. The transferor State cannot do anything about the operation of the satellite, after it is transferred. The current regime which holds transferor State liable for damage, caused by the satellite, after the transfer is unreasonable. Also, unlike the existing scenario, the transferor State should be allowed to transfer registration (if it is the State of registry) to the transferee State, so that transferor State is not obligated

[427] Armel Kerrest, "The need to implement the Outer Space Treaty through national law in the light of the current and foreseeable space activity" in the *Proceedings of the International Institute of Space Law* (Washington DC, USA: American Institute of Aeronautics and Astronautics, 2010) 551 at 556.

to exercise 'jurisdiction and control' for something that is clearly not its national activity anymore.

c) Interests of the transferee State : The transferee State often has *de facto* control over a satellite and the operation of the satellite is the State's national activity. However, if the transferee State is not the launching State of the satellite, it cannot be the State of registry and hence, cannot have 'jurisdiction and control' over the satellite. This situation is unfair and removed from practical realities. A solution has to be found. The transferee State should be held liable and this is not against its interests. It should pay for damage caused by a satellite, operated and controlled by it.

Any solution reached should be after keeping these three, somewhat conflicting, interests in mind. An ideal solution should ensure that the State or international organization to whom operation and control of satellite has been transferred should be held liable for any damage by the satellite after the transfer and responsible for the operation of the satellite. It should have jurisdiction and control over the satellite and regarded to be the State of registry for it. The transferor State, which does not have control over the satellite, should not be held liable or be the State of registry.

B. Amendment of the Space Treaties

The Outer Space Treaty and other space treaties are undoubtedly commendable endeavours. They still hold good and there is no need to rewrite them. However, as the treaties were adopted in the initial phase of space era, there has been change in circumstances today with technical innovation, commercialisation and privatisation. It has been suggested that the treaties could do with a review and some judicious adjustments without actually transforming them.[428] Explicit provisions for on-orbit satellite transfers, such as, allowing non-launching States to become State of registry and be made liable after transfer of satellite has been suggested. It has also been suggested that registration and liability be separated from the concept of launching State. During discussions on launching State in UNCOPUOS, representative of China described the

[428] Cheng, "Thirty Years On", *supra* note 249 at XVIII, XIX; Kerrest, "Remarks", *supra* note 22 at 309; Chatzipanagioti, *supra* note 22 at 231; Kerrest, "Transfer", *supra* note 62 at 2.

Chinese practice of sharing of liabilities among the joint launching States.[429] The practice is that during the launching phase i.e. from ignition to the point of separation of the satellite from the launch vehicle, the liability was on the State that provided the launching service. [430] After separation, liability for the entire operation phase is borne by the State of owner and operator of the satellite.[431] On similar lines, it has been suggested that, in case of transfer of satellite while on-orbit to a non-launching State, the liability should pass on to the new transferee who becomes the owner and operator.[432] However, these suggestions have not been found acceptable to the international community as a whole.

Also, it may be unwise to amend the space treaties. It may end up opening the Pandora's box and eventually, result in doing away with the victim-oriented structure and the principle of mutual assistance, which had been incorporated in the space treaties in the spirit of co-operation and the excitement of the new-found access to outer space.

Besides, at present, an amendment of the space treaties seems unlikely. In international politics, as Bin Cheng points out,[433] to build up an international agreement, three conditions have to be met:

(a)Perceived need on the part of the States concerned: The States must feel the need for the agreement and that it will be in their own interests. One can only hope that the representatives of States try to pursue their countries' broader long term interests and that they do not seek short-term success or personal glory to the detriment of those interests. What is fair and reasonable in the interests of international co-operation must be done .

(b) Due representation of the dominant section of international society having special concern in the subject-matter: Experience shows and truism indicates, that in any international treaty or rule making, due weight has to be given to the views of those

[429] *Report of the Chairman*, supra note 22 at para 9.
[430] *Ibid*; See also, *Launching State: Secretariat Report*, *supra* note 44, para. 17.
[431] *Ibid.*
[432] *Ibid*.
[433] Cheng, "Thirty Years On", *supra* note 249 at XVIII, XIX

whose co-operation is indispensible for the working of a treaty,[434] including those 'specially affected'.[435]

(iii) A propitious political climate: Even in cases where a given rule or treaty is found reasonable or desirable by all the States, including those which are specially affected, the rule or treaty is unlikely to come to fruition unless the international political situation is propitious for it.[436]

The COPUOS has not been successful in coming up with any treaty since the Moon Agreement, which was adopted more than thirty years ago. The Moon Agreement, too, is not successful and has only 15 State Parties, out of which hardly any is a dominant space-faring nation.

The decision-making procedure of the COPUOS is that of consensus which is "the search for the common ground in a debate by means of a scientific discussion of the problem until an agreement is reached."[437] With 74 Member States now, it has proved to be very difficult to reach a consensus in the COPUOS. Armel Kerrest writes, " Having had the opportunity to take part in some of the meetings of the COPUOS Legal Sub-Committee, I know it would be absolutely impossible to create a new satisfactory system by consensus."[438]An amendment of the space treaties will take years to take place and hence, it is not a feasible option.

C. General Assembly Resolution

Since treaties are difficult to make or amend, a way to deal with the problem is to pass a UN GA Resolution on liability and registration issues in a transfer of a satellite.[439] It is easier to garner the political will of States for a General Assembly Resolution, than

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[434] *Ibid.*
[435] *Continental Shelf Cases, supra* note 237 at 43.
[436] Cheng, "Thirty Years On", *supra* note 249 at XVIII, XIX.
[437] Julian Hermida, *Legal Basis for a National Space Legislation*, (Secaucus, New Jersey: Kluwer Academic, 2004) at 17.
[438] Kerrest, "Remarks", *supra* note 22 at 308; *See also* Trogeler, *supra* note 31 at 7.
[439] Olavo de O. Bittencourt Neto, "Regulatory Options for Dealing with the Transfer of Ownership" (Paper delivered at the IISL/ECSL Symposium on "Transfer of ownership of space objects: issues of responsibility, liability and registration", 19 March 2012), UNCOPUOS LSC, 51st Sess, 840th Mtg. (2012) at 20.

for a treaty. The Resolutions may not be binding *per se* but may eventually, become binding customary law or be the cornerstone for a future treaty/treaty provision. Once a GA Resolution becomes customary international law, it may exist parallel to treaties and be applicable even to non-Member States to treaties.

However, since the five space law treaties were drafted, several resolutions governing outer space have been passed and none of them have become a treaty provision or customary international law yet. In any case, UN Resolutions are soft laws.[440] Also, due to the consensus procedure of the COPUOS, it takes time for any resolution on space law to be passed. Hence, adopting GA Resolution does not seem to be an efficient solution.

D. Extensive interpretation of existing space treaties

A simpler and more practicable solution, than amendment of space treaties, is extensive and progressive interpretation of the existing space treaties, keeping in mind the recent commercial developments.[441]

1. Parallel Regime of Liability under Article VI of Outer Space Treaty

Article VI of the Outer Space Treaty, according to several commentators, prescribes only regulatory responsibility for State's national space activities to be in conformity with Outer Space Treaty without imposition of any liability. [442] Article VII of the Outer Space Treaty (elaborated in Liability Convention) speaks of the launching State's liability for damage caused by space objects towards other states or their nationals or property.[443] The two principles seem "nicely divided, no link or relation established,

[440] *See also* Alan Boyle and Christine Chinkin, *The Making of International Law*, (Oxford: Oxford University Press, 2007) at 212("[f]rom law-making perspective, soft law means a variety of non-legally binding instruments used in contemporary international relations").
[441] Neto, *supra* note 439 at 18; Chatzipanagioti, *supra* note 22 at 233-238.
[442] *See* example, Awford, "Commercial Space Activities: Legal Liability Issues", in Mani Bhatt and Reddy eds, *Recent Trends in International Space Law and Policy* (New Delhi, India: Lancers Books, 1997) 383 at 388.
[443] *Ibid.*

no trouble arising"[444]. On a closer look, they seem less independent and there exists a connection between the concepts of liability and responsibility in space law.[445]

Firstly, French, Spanish, Chinese and Russian, all being authentic languages of the Outer Space Treaty,[446] do not distinguish between the English words 'responsibility' and 'liability' and texts of the Treaty in these languages have used same words for 'responsibility' and 'liability' in Article VI and VII, respectively. If no differentiation exists between the two terms, then Article VII can be seen as corollary to Article VI i.e. that liability in Article VII arises as a consequence of the breach of international law by national space activities.[447]

Article III of Outer Space Treaty states that, "States Parties to the Treaty shall carry on activities in the exploration and use of outer space, including the Moon and other celestial bodies, in accordance with international law, including the Charter of the United Nations."[448] Thus, space law is not a self-contained regime,[449] though it lays down certain *lex specialis*. The concept of responsibility and liability in international law has been somewhat modified by Outer Space Treaty, which is the *lex specialis*.[450] The States are held directly responsible even for private activities and in certain circumstances, liability arises even though the State had not committed an internationally wrongful act. Such modifications have altered the general international law applicable to outer space only "to the extent"[451] it is specifically stated. Therefore, the general concept of responsibility in international law, which has residual character,[452] continues to govern space law. In general international law, liability flows to a State because of its responsibility for a wrongful act[453] and is a part of the broader concept of responsibility. Responsibility

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[444]von der Dunk, "Liability", *supra* note 119 at 363
[445] See Gorove, "Liability", *supra* note 171 at 376.
[446] Outer Space Treaty, *supra* note 11, Article XVII.
[447] Lee, "Liability", *supra* note 170 at 216-217.
[448] See UNGA Res 1472, *supra* note 7; UN GA Res 1721, *supra* note 9; *Declaration of Legal Principles, supra* note 10.
[449] See *Tehran, supra* note 123 at 40; Bruno Simma, "Self-contained regimes" (1985)16 Netherlands Yearbook of International Law 111.
[450] *Articles on Responsibility, supra* note 121, Article 55.
[451] *Articles on Responsibility, supra* note 121, Article 55.
[452] "Draft Articles Commentaries", *supra* note 124 at 32.
[453] *Corfu, supra* note 122 at 22.

generally entails double penalty- both economic and juridical.[454] In a case, the PCIJ said that "the concept of obligation to make reparation (liability) is an indispensible complement of a failure to apply a convention, and there is no necessity for this to be stated in the convention itself."[455] Accordingly, a State should be liable for all its national space activities. This is in contrast to liability under the Liability Convention and Article VII of the Outer Space Treaty according to which the launching State is liable to pay compensation for damage and the liability may even be absolute. The liability which flows from Article VI has a broader connotation and finds even those States, which have connecting link with the space activity but not launching States, liable. However, no absolute liability arises under liability flowing from Article VI because the concept of reparation in general international law is fault-based. Damage caused by a satellite, owned by a non-launching State (after on-orbit transfer), is national activity. The responsible States is can be held liable for not fulfilling its responsibility under Article VI. Since Article VII of Outer Space Treaty and Liability Convention are neither inconsistent with principle of reparation, a consequence of State responsibility, and nor do they specifically exclude it, the principle applies. Therefore, even if the new transferee State cannot be held liable under the Liability Convention and Article VII of Outer Space Treaty, the State can be found to be liable under Article VI of Outer Space Treaty and under general international law.[456]

2. Procuring launch includes on-orbit transfer of satellite

Whether transferee of an on-orbit satellite transfer or a delivery-in-orbit contract is considered a launching State, will depend on whether one considers that the launching is procured as part of the whole package. However, a State can counter-argue that it purchased the satellite while on-orbit and therefore, has not procured the launch.[457]

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[454] *See* Aldo Armando Cocca, "From Full Compensation to Total Responsibility" in *Proceedings of Twenty-Sixth Colloquium on the Law of Outer Space* (Washington DC, USA: American Institute of Aeronautics and Astronautics, 1983) 157 at 157.
[455] *Chorzow, Merits, supra* note 136 at 29.
[456] Kerrest, "Remarks", *supra* note 22 at 309
[457] Kayser, *supra* note 262 at 36

To avoid the unfair situation in-orbit satellite transfers where transferor State is found liable even after transfer of satellite, it has been suggested that the 'launching State' need not be the original launching State.[458] Any State, which has obtained benefit from launch, whether or not it was involved in the actual launch of satellite, should be taken as launching State too.[459] The interpretation should be that the status of launching State need not be acquired only at the moment of launch but may be acquired later and hence, when a State purchases a satellite on-orbit, it can be said to have procured the launch.[460]

Hence, once the transfer of operation and control of satellite takes place, the new transferee should be held liable and that State should be responsible for continuing supervision of the activity of that satellite.[461]

3. State of registry and non-launching State

Julian Hermida and Aldo Cocca has said that even a non-launching State can have 'jurisdiction and control'. According to them, Registration Convention allows the possibility of concluding agreements on jurisdiction and control over space objects and launching States can agree to transfer some or all jurisdiction and control to non-launching States.[462] Article II(2) of the Registration Convention provides that launching States shall jointly determine the State of registry, bearing in mind Article VIII of Outer Space Treaty, but such determination will be without prejudice to agreements between launching States on jurisdiction and control.[463] Vienna Convention on the Law of Treaties, which is also reflection of international customary law, provides that States can create rights and obligations for a third State only with its consent.[464] In case a right is conferred, consent is presumed[465] whereas in case of obligations created, express written

[458] Schrogl & Davies, *supra* note 279 at 370-371.
[459] *Ibid*.
[460] Julian Hermida, "Transfer of satellites in orbit. An International Law Approach" in *Proceedings of Forty-Sixth Colloquium on the Law of Outer Space* (Washington DC, USA: American Institute of Aeronautics and Astronautics, 2003) 189 at 191. [Hermida, "Transfer"]
[461] *Recommendations on national legislation relevant to the peaceful exploration and use of outer space*, UNGAOR, 2012, Appendix at 40, UN Doc A/AC.105/1003 [*Recommendations on national legislation*].
[462] Hermida, "Transfer", *supra* note 460 at 190; Horl & Hermida, *supra* note 306 at 457-58.
[463] Cocca, "Registration", *supra* note 287 at 180.
[464] *Vienna Convention on Law of Treaties*, *supra* note 238, Article 34.
[465] *Vienna Convention on Law of Treaties*, *supra* note 238, Article 36.

consent of third State is necessary.[466] According to these authors, jurisdiction and control can be transferred to third State with their written consent.[467]

Other authors have suggested that by a separate agreement, the transferor may assign its rights under Article VIII of the Convention to the transferee.[468] If several States were involved in the launch of the satellite, then this solution is based on the presumption that the transferor State has the right of jurisdiction and control as per Article VIII of the Outer Space Treaty, Article II of the Registration Convention and agreements between launching States.

However, such interpretation is in derogation to Article VIII of the Outer Space Treaty. As discussed above, in space law, the nationality link is not there[469] and the only way States have jurisdiction and control over space objects is through registration. Altering the link between registration and jurisdiction, through alternative arrangements between States, will bring about uncertainty regarding which State has jurisdiction and control [470] It is questionable whether by such agreements, States can escape their obligations under Article VIII of the Outer Space Treaty and derogate from it by an agreement.[471] An agreement between States cannot derogate from treaty provisions which the States have ratified or acceded to, according to the principle of *pacta sunt servanda.*[472] In any case, in the author's opinion, if the drafters wanted that third parties can be made State of registry by agreement, they would have been more specific about it.

In addition, such above-mentioned arrangements are also not required to be reported to the UN and recorded in the UN register according to Article II(2) of Registration Convention. This is in contrast to Article 83*bis* of the Chicago Convention where permitted deviation from the Convention, by separate agreement between the Member States, is effective vis-a-vis other parties to the Convention, only when such agreement have been directly communicated to other members or when such agreement

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[466] *Vienna Convention on Law of Treaties*, *supra* note 238, Article 35.
[467] Hermida, "Transfer", *supra* note 460 at190; Horl & Hermida, *supra* note 306 at 457, 458.
[468] *See* Chatzipanagiotis, *supra* note 22 at 232.
[469] See text accompanying note 300-302.
[470] Cheng, *Studies, supra* note 118 at 473-474.
[471] Brownlie, *supra* note 121 at 671.
[472] *Vienna Convention on Law of Treaties*, *supra* note 238, Article 26.

have been registered with and made public by the International Civil Aviation Organization. It is also pertinent to look into Article V of the Liability Convention which states that special agreements between launching States (for apportioning liability) do not affect the right of third parties to claim compensation from these States under the Liability Convention. Thus, bilateral agreements between two States do not alter their position vis-a-vis other State Parties, unless alteration of position has been declared publicly and such alteration of position not prohibited by the Convention.[473]

The Registration Convention does not provide for information about the said arrangements to be made public. In this circumstance, if it is interpreted that States can make these arrangements under the Registration Convention and the arrangements will be effective vis-a-vis third parties, it will create confusion as to which State has 'jurisdiction and control' and consequently, which law will be applicable on-board satellite.[474] Thus, third parties will be misled and Article VIII will lose all its credibility.

However, if transferee States of on-orbit satellite transfer are regarded as launching States for procuring launch, they can also become the State of registry having 'jurisdiction and control' without violating Article VIII of the Outer Space Treaty.

4. Assessment

Though extensive interpretation seem to be a plausible solution, there are many difficulties in implementing it. Firstly, several States may not accept such interpretation. There are strict restrictions imposed upon mandate of the working groups of the Legal Subcommittee of COPUOS. This was evidenced during the adoption of resolutions on Application of Launching State when the working groups were not allowed to elaborate on proposals for revision of existing norms or to provide authoritative interpretation to space treaties.[475] In fact, even the UN GA Res 62/101 of 17 December 2007[476] and UN GA Res 59/115[477] provide that they are not an authoritative interpretation to the space treaties. The only way, that such extensive interpretation can become the norm, is by

[473] *See Vienna Convention on the Law of Treaties*, *supra* note 238, Article 41.
[474] Cheng, *Studies, supra* note 118 at 485.
[475] Chatzipanagiotis, *supra* note 22 at 231; *See also* Schrogl & Davies, *supra* note 279 at 372.
[476] UN GA Res 62/101, *supra* note 325.
[477] UN GA Res 59/115, *supra* note 169.

State practice and expression of intent to abide by such interpretation (*opinio juris)* by the States. An instance of this is change meaning of 'peaceful purposes' in the Outer Space Treaty from 'non-military' to 'non-aggressive' over time with State practice.[478] However, such adoption of extensive interpretation, as a solution to legal issues in on-orbit satellite transfers, may not find support in States whose interests are preserved by restrictive interpretations, such as, the Netherlands and the UK. Hence, such extensive interpretation, though will provide an excellent solution, cannot be the answer, at least in the short-term.

E. National Legislation

Another alternative solution can be regulating the matter by national space legislations. In the recent past, the LSC of COPUOS and various commentators have stressed upon the importance of national legislations and that they can solve several issues not addressed by the space treaties.[479] According to some commentators, the solution in this case too lies in enacting and enforcing national legislations.[480] In fact, this seems to be the stance of the States in COPUOS.

In 2012 report of the LSC of COPUOS, it was recommended that the States enact national laws which provide for obligations to submit information about the change in status of the operation of a space object.[481] The States should always have updated information regarding transfer of satellites and they should provide the updated and accurate information on such changes to the UN Secretariat.

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[478] A.J. Butler, "Peaceful use and Self-defence in Outer Space" in *Proceedings of The Twenty-Fifth Colloquium on The Law of Outer Space* (Washington DC, USA: American Institute of Aeronautics and Astronautics,1982) 77 at 78, 79 ; "Soviets Outstanding US on Space by $ 3-4 million", *Aviation Week and Space Technology*, (19 July 1982) at 28; Donald A. Vogt, "Space Arms Control: A Difficult Process', Law" in *Proceedings of The Twenty-Fifth Colloquium on The Law of Outer Space* (Washington DC, USA: American Institute of Aeronautics and Astronautics,1982) 167 at 167,168.

[479] Ram S. Jakhu, "Regulation of Small & Micro Satellites", (Paper delivered at the "6th IAASS Conference: Safety is Not an Option" , Montreal, Canada, 21-23 May 2013) [unpublished] at 2 [Jakhu, "Micro Satellites"].

[480] Horl & Gungaphul, *supra* note 71 ; Trögeler, *supra* note 31 at 8.

[481] *Recommendations on national legislation, supra* note 461; *See* Irmgard Marboe, "The Importance of National Space Legislation for the Peaceful Uses of Outer Space" (paper delivered at the UNCOPUOS Legal Subcommittee,16 April 2013); *Set of recommendations on national legislation relevant to the peaceful exploration and use of outer space, for submission as a separate draft resolution for consideration by the General Assembly at its sixty-eighth session*, UNGAOR, 56th Sess, Annex III, UN Doc A/AC.105/1045(2013).

Certain States have made efforts to deal with the situation by their national laws. An approach, such as, the one by France, Belgium and Austria is to limit the possibility of transfer of satellites by regulation and authorisation. This limitation of possibility of transfer of satellites restricts cross-border satellite business and hence, not recommended. National laws of some other States allow transfer of authorisation. According to Section 7 of the USA's Commercial Space Launch Act, the Secretary of Transportation may transfer the authorisation to an applicant who meets the licensing requirements. Similar provision has been incorporated in Australian law. Under UK's Outer Space Act, authorisation may be transferred, with the written consent of the Secretary of State, though the conditions, that should be met, have not been laid down. These laws require that the new transferee meets financial and other personal requirements. But, they do not lay down anything about a situation where the transferee is not within the jurisdiction of the State. The matter has been addressed to some extent by the UK which consents to the transfer under its Outer Space Act only if the new appropriate State exempts the UK from its liability as a launching State.[482] However, even if appropriate State exempts the original launching State, the latter continues to be liable to third parties in international law.

Space-faring nations may lay down the jurisdictional scope of space activities are governed by the domestic laws.[483] However, these domestic laws have no application in international sphere because a State cannot escape international responsibility and liability by enacting internal laws.[484]

Undeniably, national regulations can improve the present situation. The State of the transferor can, of course, enter into bilateral agreements with the State of the transferee and have provisions by which the transferee State accepts liability. The second way can be that the 'former appropriate but still liable' transferor State can govern the matter by obliging the holder of the authorisation. The restrictions may be put in the original authorization itself, as a condition to the authorization.[485] The restriction may

[482] *See* Gerhard, *supra* note 32 at 577.
[483] *Report of the Chairman*, *supra* note 22 at para 9.
[484] Vienna Convention on the Law of Treaties, *supra* note 238, Article 27.
[485] *See* Gerhard, *supra* note 32 at 578-580.

also be put in a separate document stating that transfer of authorization will be valid, subject to consent of authorizing authority and the consent will be based on certain conditions, which have to be complied with for a successful transfer.[486] Such restriction will be that the transferor has to enter into an agreement (whether or not as a part of original transfer agreement) regarding derogation from liability for the satellite or ensure that the transferee State make a unilateral declaration accepting liability. However, national laws cannot be viable solution by themselves, especially when private entities are involved. This will be elaborated in next sub-chapters.

The States should also record the on-orbit satellite transfers and also send such information to UN as recommended by the Resolutions. However, no national law can completely address the inconsistency in the existing system of registration, according to which in a transfer of satellite to a non-launching State, the transferee State cannot become the State of registry.

F. Unilateral Declarations

It has been recognised by publicists that unilateral acts are capable of having legal effects[487] and a State can accept international obligations by unilateral declarations.[488] In *Nuclear Tests Case* (*Australia v France*),[489] the ICJ held that France was bound by the publicly given undertakings to cease conduct of atmospheric nuclear tests, that had been made on behalf of French Government. According to the Court, the conditions to be fulfilled for a declaration to be binding are: a) it should be made by the State with the intention of being bound by its terms (b) the declaration be made publicly and (c) there is no requirement of a *quid pro quo.*[490]

One solution to the present problem is that the State of the transferee provide an official public declaration to the UN, accepting liability (including duty to indemnify fully, in case the victim claims compensation from transferor State) and submitting

[486] *Ibid*.
[487] Brownlie, *supra* note 121 at 640.
[488] *Ibid* at 641.
[489] *Nuclear Tests Case (New Zealand v France)* [1974] ICJ Rep 253 at 267-71.
[490] *See also Nicaragua, supra* note 122 at 132, para 261; *Continental Shelf, supra* note 237 at 25, paras 27-28.; *Case Concerning the Frontier Dispute (Burkina Faso v Mali*) [1986] ICJ Rep 554 at 573.

information regarding the transfer of space object to the UN.[491] Benefits of a system of unilateral declaration is that the process is straightforward and can be implemented immediately. However, lack of a standard procedure for a unilateral declaration may eventually give rise to conflicts of interpretation and conflicts of opinion.[492] Hence, unilateral declaration may not prove to be that effective. Also, a non-governmental entity may find it difficult to convince its government to make such declaration.[493] Perhaps, the best way is to back the unilateral declaration by a bilateral agreement between concerned States.[494]

G. Contracts between private entities

Another solution is for transferor entity and transferee entity to enter into a private contractual arrangement, by which the transferee entity agrees to be liable and indemnify any compensation that the transferor or transferor's State has to pay due to damage caused by the satellite transferred. In any case, as a matter of commercial sense,[495] such contractual arrangements have been entered into during such transfers.[496] This can be in the form of separate agreement or a part of the transfer agreement. If satellites are given as security, as contemplated by the Space Assets Protocol, similar provisions providing explicitly liability of transferee in case of transfer of satellites, due to default, should be incorporated in finance contract.

However, it does not seem wisest to let the matter to be governed by complex system of private contracts. The problem, at hand, is one of public international law, which governs the States and where private parties have no standing. This is especially in the case of space law. Paul G. Dembling states, "The second sentence of Article VI [of Outer Space Treaty] would prohibit, as a matter of treaty obligation, strictly private, unregulated activity in outer space or on celestial bodies even at a time when such private

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[491] *See* Neto, *supra* note 439 at 20; *See* Gerhard, *supra* note 32 at 579; Chatzipanagioti, *supra* note 22 at 233-234.
[492] *Ibid*.
[493] Gerhard, *supra* note 32 at 579-580.
[494] Neto, *supra* note 439 at 20.
[495] Lee, "Effects", *supra* note 68 at 151.
[496] von der Dunk, "Commercial Space Activities", *supra* note 218 at 163; von der Dunk, "Illogical Link" , *supra* note 78 at 354-355.

activity becomes most common place."[497] Firstly, authorization of transferor State may be needed under its national laws, even in transfers by private contracts. Only with the support of public law, private agreements become more effective and enforceable.[498] Secondly, involvement of transferee's State is also required. Otherwise, the transferee, if it is a private entity, may become bankrupt and the transferor (and/or State of transferor) may find itself liable with no possibility of indemnification by transferee.

H. Bilateral Treaties

An alternative solution is to incorporate provisions in bilateral agreements between the transferor's and transferee's States that make the transferee liable and that exculpate transferee from liability. These agreements should also put obligation on both the States to give information regarding the same the UN Secretariat. Transferee State should also maintain such information in its national register. These agreements are in the nature of those contemplated in Article V of the Liability Convention, though those agreements are only between original launching States.[499]

Whereas these agreements do not change the status of the States as launching State or State of registry, they provide a workable fair system. For the victim, however, the transferor State is still a launching State, from whom he can receive compensation. But, in that case, the transferee State has to indemnify the transferor State, as provided in the bilateral agreement.

It may, however, be difficult to have bilateral treaties when satellites are transferred to creditor, due to default of payment. Space financing contracts with satellites as assets, thus, have to involve the States. Private parties to transfer may find it difficult to make their States enter into bilateral agreement. Further, such agreements cannot transfer the State of registry, if the transferee State is non-launching State.

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[497] Dembling, "Treaty", *supra* note 118 at 17; *See also* Jakhu, "Micro Satellites", *supra* note 479 at 1.
[498] Hart H. Almond, "Application and Implementation, The Law of outer Space" in *Proceedings of the Fortieth Colloquium on the Law of Outer Space,* (Washington DC, USA: American Institute of Aeronautics and Astronautics,1997) 193 at 195.
[499] Kerrest, "Transfer", *supra* note 62 at 5.

CONCLUSION AND SUMMARY

Detailed analysis of problems plaguing on-orbit satellite transfer business has given some important insights:

a) Ownership and control of satellites can be transferred under space law.

b) On-orbit satellite transfers have happened ever since early 1990s and today, with the growing demand of satellite services, there will be more such cases happening. Such transfers may be sale, lease and transfer of security interest, among others. They can also happen due to cross-border mergers and acquisitions, transfer of territory between States, change in status of inter-governmental entity and other reasons.

c) Once a State is a launching State, it is the launching State forever. The State of registry, however, can be changed, provided that the new State of registry is also a launching State. Appropriate State can also change.

d) On-orbit transfers may be classified as:

i) between entities within a State,

ii) between entities in two launching States, and

iii) between entities in a launching and a non-launching State.

The first case is addressed by national laws. No legal difficulty arises under international law in the second case. Both transferee and transferor States are liable from before and in any case, the States can have an agreement apportioning their liability under Article V of the Liability Convention. Also, there is no legal barrier to changing the State of registry. It is in the third case that significant legal complications arise.

e) In case of transfer between launching and non-launching State, the transferee State is the appropriate State for authorizing the operation of satellite. Transferee State is not the launching State or State of registry. It may have *de facto* control over satellite but not *de jure* control. This situation is unreasonable.

f) State practice regarding transfer of satellite on-orbit has not been consistent. Whereas in some cases, transferee States claim 'jurisdiction and control' despite not being State of registry, in others, there is not even change in actual control post-transfer.

g) Restrictions on on-orbit satellite transfers are put by certain States, so that they are not held internationally liable after transfer takes place. Also, States have put export controls and other restrictions on transfer of satellites by their national laws.

The present regime on the matter is ambiguous and dissatisfactory. Law has not been changed to be at pace with commercial development. As a result, State practice are clearly incoherent and at times, even violative of international space law. Also, the isolated cases of on-orbit satellite transfers cannot be seen as creating customary international law.[500]

It seems, that in most cases of on-orbit satellite transfers, the entities involved have simply entered into private arrangements, without State involvement. Naturally, the need was not felt, in most cases, to inform the UN Secretary-General. Also, there have been attempts made by the States to escape liability for damage caused by transferred satellites. A situation may arise when the transferor State denies liability for not being in actual charge of operation of satellites and transferee State denies liability by taking advantage of lacunae and inconsistencies in space treaties. Further, the States do not have a consistent practice regarding submitting information to UN Secretariat regarding the transfer, despite UN resolutions recommending such information to be submitted. The best practice is seen in the transfer of satellites registered in the UK to China. The UK informed the UN about removing the satellites from its register and China informed the UN about including the satellites in its register.

The legal difficulties and the incoherent State practice necessitate an immediate solution. The concerned topic has been discussed in the UNCOPUOS and there does not seem to be a political will to take concerted efforts by the States. Multilateral attempts to create treaty law or intention of States at large to accept a principle as customary law does not seem to be underway at the moment. The immediate solution is entering into bilateral agreements by concerned States, whereby the transferee State agrees to be liable and to indemnify transferor State for any damage caused by the satellite. Between themselves, the transferee State should be given 'jurisdiction and control' over the satellite

[500] Julian Hermida, "Argentine Space Law and Policy" (1996) 21:2 Ann. Air Sp. L 177 at 178.

as transferor State does not have actual control over it. Meanwhile, the States should accept an extensive interpretation of the space treaties. The existing space treaties do not need an overhaul and are, in fact, creditable and foresighted work. They simply need a more logical interpretation, in the light of the present circumstances. The transferee State in an on-orbit satellite transfer should be considered as procuring the satellite and hence, a launching State. Therefore, the transferee State can be held liable and can also become the State of registry. This is the most simple but pragmatic solution. Furthermore, States should make national laws more favourable to satellite transfers.

In short, there is neither need nor political will to amend the space treaties. Though the existing space treaties apparently seem incompatible to the new development of on-orbit satellite transfers, a progressive interpretation will make the system adequate to deal with this new product of space commercialisation, namely on-orbit satellite transfers.

APPENDIX

I. Suggested Bilateral Agreement between the States in case of an on-orbit satellite sale

10 November 2013

Agreement between

Government of X

and

Government of Y

for Liability and Furnishing of Information for On-Orbit Sale of Satellites[501]

The Government of X and the Government of Y (hereinafter the "Parties")

Noting the Liability Convention and Article VII of the Outer Space Treaty, to which both the States are parties, affix liability on launching States;

Noting that the Registration Convention, to which both States are parties, provides that only launching States can be State of registry;

Noting that Government of Y was not involved in launch of satellite X1;

Desiring to have an efficient and reasonable system of third party liability for damage caused by space object transferred;

Have agreed as follows:

Article I

This Agreement applies to the X1 satellite sold to national of Y by national of X.

Article II

The Government of Y assumes liability for any damage caused by X1. The Government of Y shall compensate the Government of X for any amount the Government of X has to pay to third parties for being liable for X1 under the Liability Convention, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies or any other applicable international law.

[501] Memorandum of Agreement on Liability for Satellite Launches Between the Government of the United States of America and the Government of the People's Republic of China

Article III

In the event that a claim for compensation for damage within the scope of Article II is brought against the Government of X, the Government of the X, as soon as practicable after receiving notice of such claim, shall notify the Government of Y thereof.

Article IV

Any settlement made by Government of X with the claimant shall be made only after consultation with Government of Y. The Government of Y shall not be liable to compensate any settlement made without consulting it or any settlement entered into by Government of X and claimant whose terms have not been approved by the Government of Y.

Article V

Notwithstanding anything stated in Article IV, for any claim brought against Government of X in the Claims Commission under Article XIV of the Liability Convention, the Government of Y shall compensate the Government of Y the amount of compensation recommended by the Claims Commission. Any claim brought in the Claims Commission by the Government of X will be in consultation with the Government of Y. Selection of member of Claims Commission according to Articles XV, XVI and XVII of the Liability Convention by the Government of X require prior consultation of the Government of Y.

Article VI

The Government of Y shall provide to the Government of X, at the latter's request, all information and cooperation necessary for the defense of any such claim against the Government of X.

Article VII

The Parties shall furnish information about the sale to the UN Secretariat.

Article VIII

The Government of X which, being the State of registry, has jurisdiction and control over X1, transfers it to Government of Y. As between the parties, the jurisdiction and control will lie on the Government of Y which will exercise it on behalf of the Government of X.

Article VIII

Disputes relating to the interpretation or application of this Agreement shall be resolved through consultations between the Parties, or through any other means agreed upon by the Parties.

IN WITNESS WHEREOF, the undersigned, being duly authorized by their respective governments, have signed this Agreement.

DONE at Montreal in duplicate, in the English and XXX languages, both texts being equally authentic, this 30 day of October, 2013.

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