JOURNAL

OF

SPACE

LAW

VOLUME 33, NUMBER 2

Winter 2007

JOURNAL OF SPACE LAW

UNIVERSITY OF MISSISSIPPI SCHOOL OF LAW
A JOURNAL DEVOTED TO SPACE LAW AND THE LEGAL PROBLEMS ARISING OUT OF HUMAN ACTIVITIES IN OUTER SPACE.

VOLUME 33 **WINTER 2007** **NUMBER 2**

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JOURNAL OF SPACE LAW. The subscription rate for 2007 is $100 U.S. for U.S. domestic/individual; $120 U.S. for U.S. domestic/organization; $105 U.S. for non-U.S./individual; $125 U.S. for non-U.S./organization. Single issues may be ordered at $70 per issue. For non-U.S. airmail, add $20 U.S. Please see subscription page at the back of this Volume.

ISSN: 0095-7577

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CONTENTS

FOREWORD

SPECIAL TOPICS: SPACE LAW IN ASIA THE INTERFACE BETWEEN AVIATION AND SPACE LAW

Joanne Irene Gabrynowicz[1]

This issue of the JOURNAL OF SPACE LAW is organized into two major topics: space law in Asia; and, the interface between aviation and space law. It also contains the JOURNAL'S regular features and two special student contributions.

A main topic in this issue of the JOURNAL OF SPACE LAW is space law in Asia. It is addressed in this issue's commentary; by a paper that includes a study on space law in mainland China; unofficial translations of some Chinese space laws; and, an unofficial translation of a new Japanese geospatial information law.

A Study of Aerospace Legislation of China is a paper offered by Prof. Qi Yong Liang, Director of the Chinese Institute of Space Law. It is an unofficial translation of a paper he presented at the International Forum on Air and Space Law held in

[1] Joanne Irene Gabrynowicz is the Editor-in-Chief of the JOURNAL OF SPACE LAW. She is also a professor of space law and remote sensing law and the Director of the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi School of Law. Prof. Gabrynowicz was the recipient of the 2001 Women in Aerospace Outstanding International Award and is a Director of the International Institute of Space Law and a member of the American Bar Association Forum on Air and Space Law.

Beijing, China on June 25 - 26, 2007. Prof. Yun Zhao of the City University of Hong Kong in his commentary, *National Space Legislation in Mainland China*, offers another view of the subject. Prof. Zhao provides the reader with an overview of the subject. He begins in 1970 and includes an introduction to policy that led to law; a description of the organization of national space activities and institutions; and, a description of the current and evolving legal framework.

Some of the Chinese laws that are the subjects of Prof. Qi Yong Liang's and of Prof. Yun Zhao's work are also made available in this volume. They are *Order No. 6 of the Commission of Science, Technology, and Industry for National Defense and the Ministry of Foreign Affairs of the People's Republic of China*, 8 February 2001; and, *Order No. 12 of the Commission of Science, Technology, and Industry for National Defense of the People's Republic of China*, 21 November 2002. They address the registration, launching, and licensing of space objects. These unofficial translations are provided to JOURNAL OF SPACE LAW readers as the product of a special cooperative activity between the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi School of Law and the Faculty of International Law of China University of Political Science and Law. The JOURNAL OF SPACE LAW would like to acknowledge the special contribution made by Prof. Yan Ling in organizing the translation work.

The section on space law in Asia is rounded out with the inclusion of another unofficial translation of a very recent Japanese law titled, *Geospatial Information Utilization Promotion Bill of May 30, 2007*. The purpose of this law is to promote planned and comprehensive measures and policies to advance the use of geospatial information in Japan. It contains a dedicated section titled, "Policies and Measures Concerning Satellite Positioning". There are also a wide variety of related topics including, business strengths; coordination of strengths; legislative measures; formulation of the geospatial information utilization promotion master plan; maintenance of a cooperative framework of related government organizations; dissemination of knowledge; government utilization of geospatial information; and, protection of personal information, among many others.

The other main topic contained in this issue is the interface between aviation and space law. It is addressed from both a U.S. national perspective and an international perspective. In her paper, *Suborbital Space Tourism Flights: An Overview of Some Regulatory Issues at the Interface of Air and Space Law*, Ms. Melanie Walker focuses on issues and considerations regarding sub-orbital space flights. She distinguishes these flights from orbital flights due to their near term possibility for space tourism. Ms. Walker then considers the authority granted by Congress to the U.S. Department of Transportation, Federal Aviation Administration to regulate suborbital flights and addresses what she sees are some critical issues related to that authority. They include, restricted authority; whether or not the regulations embody a laissez-faire approach; informed consent; liability and allocation of risk; experimental permits versus a license; the jurisdictional issues of determining the proper legal regime and choosing a forum; and, the definition of an "aircraft" and a "spacecraft".

The international dimension of the interface between aviation and space law is addressed by Dr. Stephan Hobe, Dr. Gérardine Meishan Goh, and Ms. Julia Neumann in their paper, *Space Tourism Activities – Emerging Challenges to Air and Space Law?* They identify the emerging challenges to space tourism as including issues of the applicability of air law and space law; registration and jurisdiction; authorization; and, liability. It is the "hybrid nature of the location" in which aircraft and spacecraft technologies are used that, according to the authors, will likely require the applicability of both air law and space law. They further address "the traditional dichotomy between States and private actors" and its relevance to space tourism.

Mr. P.J. Blount further examines the relationship between private actors and States in his paper, *Jurisdiction in Outer Space: Challenges of Private Individuals in Space.* Mr. Blount considers the problems of asserting national jurisdiction over individuals that will be traveling through a global commons. He examines the gaps in jurisdictional control and suggests the adaptation of a terrestrial legal device to fill them in: travel visas.

Student participation is a prominent feature of this issue of the JOURNAL OF SPACE LAW. It contains a paper and a case note on important current events in space law. In her paper, *Patent Rights Under Space Act Agreements and Procurement Contracts: A Comparison by the Examination of NASA's Commercial Orbital Transportation Services (COTS),* third-year law student Ms. Tiphany Baker Dickerson compares traditional procurement contracts with the most legal recent mechanism employed by the U.S. National Aeronautics and Space Administration to secure space transportation services from the U.S. private sector: the COTS agreement. Ms. Baker Dickerson asks whether COTS provides newer, more extensive options for companies to retain intellectual property rights that are unavailable through the traditional contracts.

In his case note, *Corporate-Sovereign Symbiosis: Wilson v. Imagesat International, Shareholders' Actions, and the Dualistic Nature Of State-Owned Corporations,* second year student Jason A. Crook analyzes the U.S. Federal case of *Wilson v. ImageSat International N.V.*, which is currently pending in the United States District Court for the Southern District of New York. This is a suit in which shareholders are bringing an action against ImageSat International, a commercial remote sensing company. While shareholder actions are common, this case raises the uncommon question of to what extent can a Nation-State incur liability when it seeks to further its political objectives through a corporate form? What are its fiduciary responsibilities to shareholders? Mr. Crook posits that the "heart" of the dispute contains the question of what happens when an entity tries to have it both ways. He asks, "[w]hen an entity acts like a corporation in some settings and as an extension of a Nation-State in other, are they to be treated as a government instrumentality, a private institution, or some combination in between?" As Mr. Crook states, "Given the proliferation of State-supported entities in the technology and defense industries, these questions merit discussion."

Finally, this issue of the JOURNAL OF SPACE LAW is completed with a book review and a bibliography. The book review is by Dr. Sylvia Ospina of "Direito e Política na Era Espacial: Podemos ser Mais Justos no Espaço de Que Na Terra?" ("Law

and Policy in the Space Age: Can We Be More Just [or Equitable] in Space than on Earth?") a recent publication by Prof. José Monserrat Filho. The regular featured Bibliography of Space Law and Relevant Publications contains case law; law review articles; periodical materials; and, books that have become available since the publication of the last issue of the JOURNAL OF SPACE LAW.

CALL FOR PAPERS

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Volume 34, Issue 1

The National Center for Remote Sensing, Air, and Space Law of the University of Mississippi School of Law is delighted to announce that it will publish Volume 34, issue 1 of the *JOURNAL OF SPACE LAW* in the first half of 2008.

Authors are invited to submit manuscripts, and accompanying abstracts, for review and possible publication in the *JOURNAL OF SPACE LAW*. Submission of manuscripts and abstracts via email is preferred.

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To be considered for the next issue, submissions should be received on or before March 31, 2008. The *JOURNAL OF SPACE LAW* will continue to accept and review submissions on an on-going basis.

ARTICLES

JURISDICTION IN OUTER SPACE: CHALLENGES OF PRIVATE INDIVIDUALS IN SPACE

P.J. Blount[*]

"One of the great things about working in this field is the realization that the future – the future that imagination has taken us to so often before – is closer now in a real way than it has ever been. Private citizens will fly in space on private vehicles."
-Patricia Smith
[1]

"Law must precede man into space."
-Andrew G. Haley[2]

[*] Research Counsel at the National Center for Remote Sensing, Air, and Space Law. The author wishes to thank David Sagar of Queen Mary, University of London for his invaluable help in preparing this paper.

[1] *How Safe Is the Race To Send Tourists into Space?*, THE WALL STREET JOURNAL ONLINE, Apr. 19, 2007, http://online.wsj.com/article/SB117683067961072819.html. Smith is the Associate Administrator for Commercial Space Transportation with the Federal Aviation Commission.

[2] ANDREW G. HALEY, *Space Age Presents Immediate Legal Problems*, 1 PROC. COLLOQ. L. OUTER SPACE 5 (Andrew G. Haley & Welf Heinrich eds., Wein, Springer, Verlag 1959).

I. INTRODUCTION

A. The problem of Judicial Jurisdiction in Space

In the midst of the space race that began in the 1950s, jurists began defining what legal rules would apply in outer space. The United Nations formed the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) which drafted the so called Outer Space Treaty (OST).[3] This treaty (and the four other general treaties on space that followed) set out rules that governed the interactions between States in outer space. These treaties as a whole, though, tend to ignore the gamut of possible interactions between individuals in space. Because there are "no detailed rules . . . in the treaty on Outer Space governing the exercise of State Jurisdiction in outer space,"[4] there are nebulous jurisdictional areas in space. The state parties did agree that space would be the "province of all mankind,"[5] creating an extra-jurisdictional international territory. At the time this did not present a real problem because "[t]he great cost of space exploration mean[t] that it [was] a matter for government appropriations."[6]

In recent decades the climate of space exploration has changed dramatically. The private sector has become more instrumental in the exploration and exploitation of space. This means that there will soon be new types of relationships occurring between individuals in space who are not necessarily representatives of a state entity and that the treaty regimes have not anticipated. As one jurist stated: "Human Nature being what it is . . . what criminal law will guide and judge the behav-

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[3] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, Jan. 27, 1967, 610 U.N.T.S. 205 [hereinafter OST].

[4] IMRE ANTHONY CSABAFI, THE CONCEPT OF STATE JURISDICTION IN INTERNATIONAL SPACE LAW 3 (Nijhoff 1971). It should be noted that Csabafi's book was written before the ratification of the Registration Treaty.

[5] OST, *supra* note 3, at art. 1.

[6] EILENE GALLOWAY, *The Community of Law and Science*, 1 PROC. COLL. L. OUTER SPACE 62 (Andrew G. Haley & Welf Heinrich eds., Wein, Springer, Verlag 1959).

ior of mankind in space?"[7] This question should rightly be expanded to include civil law issues as well. As the law stands there are jurisdictional lacunae in which man may soon find himself. At the First Colloquium on the Law of Outer Space, Andrew G. Haley stated that "law must precede man into space."[8] The laws of the early days of space exploration were sufficient to precede states into space, but now new laws must be developed in order to precede the growing private sector into space. This will be a daunting task since there has not been a new space treaty since the Moon Agreement[9] which entered into force in 1984 and has not been widely ratified.[10]

Since the "notion of jurisdiction finds its origins in the concept of territory, the principle of sovereign equality, and non-interference with the domestic affairs of states," nations will have to use new and innovative legal regimes in order to exert legal controls over people in space.[11] This paper will survey the current national and international jurisdictional regimes that are present in the context of outer space. First, it will address both international customary law and treaty law contexts for jurisdiction in outer space. It will then identify the lacunae which are left open by the international regimes. Following this analysis, it will look at ways in which states have used national laws to fill these gaps in jurisdiction. In so doing, the paper will illustrate that states have only created a jurisdictional patchwork that will be ineffective in the coming space boom. Finally, this paper will propose the concept of a space visa which will serve as a way to create an internationally uniform jurisdictional regime. The space visa will seek to treat spaceports as border regions, much as airports are treated today. Through

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[7] Hans Sinha, *Criminal Jurisdiction on the International Space Station*, 30 J. SPACE L. 85, 86 (2004).

[8] HALEY, *supra* note 2.

[9] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 18, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].

[10] United Nations Treaties and Principles on Outer Space, Addendum, STATUS OF INTERNATIONAL AGREEMENTS RELATING TO ACTIVITIES IN OUTER SPACE AS AT 1 JANUARY 2005 at 8-15, ST/SPACE/11/Add. 1/Rev. 2, U.N. Sales No. E.02.I.20 (2005), *available at* http://www.unoosa.org/pdf/publications/ST_SPACE_11_Add1_Rev2E.pdf [hereinafter STATUS].

[11] CSABAFI , *supra* note 4, at 49.

the auspices of the space visa, a state will grant permission to leave the territory and enter space. In exchange for the permission, the space traveler will subjugate himself to the personal jurisdiction and laws of that state. The result will be a regime in which every individual in space will be subject to at least one state's jurisdiction at all times, and that states will be better equipped to fulfill their duty to supervise non-governmental entities in space.

B. Why it's important - New ways for humans to interact in space

1. Space Tourism

One of the newest developments in relation to outer space is the idea of space tourism. On April 30, 2001 Dennis Tito became the first space tourist when he visited the International Space Station (ISS) as a guest of the Russian Government.[12] While Tito's trip was groundbreaking, it is most likely not the model for future space tourism. Tito was the guest of a government entity and therefore under a significant amount of government control.[13] Space tourism of the future will most likely be more closely modeled on the terrestrial tourist industry in which private companies provide the service of facilitating space travel. This model is exhibited in ventures such as Virgin Galactic, which is scheduled for its first flight into space with space tourists on board in 2008.[14] With at least 100 people signed up for the initial flight at $200,000 a ticket, there might be enough interest to make this business venture profitable at some point.[15] According to Steve Attenborough, Virgin's head of astronaut relations, if Virgin can prove that space tourism is "commercially viable," then "potentially there is a wall of

[12] R. Thomas Rankin, *Space Tourism: Fanny Packs, Ugly T-Shirts, and the Law in Outer Space*, 36 SUFFOLK U.L. REV. 695 (2003).

[13] Trips like this are brokered through a private entity, Space Adventures, Ltd. As of April 2007, 5 civilians have made such a flight. *See* WALL STREET JOURNAL ONLINE, *supra* note 1.

[14] Simon Hattenstone, *Joy Ride*, THE GUARDIAN WEEKEND, Nov. 11, 2006, at 20 (on file with author).

[15] *Id*.

money, of private sector money, that will come into the industry and then you could see things develop very quickly."[16] Virgin Galactic is not the only player in the game either. A quick look at the Personal Spaceflight Federation's web page shows at least 15 businesses that are all working towards the goal of commercial personal space flight, and this list can hardly be seen as exhaustive.[17]

If Attenborough's prediction is correct and Virgin can create a working business model, then it is possible that space tourism could be the biggest boost the space industry has received since the Cold War infused the space race of the 1960's with public support. It could also serve to create the biggest challenges for the legal regime in space since the initial rush of treaties that followed the moon landing. Those treaties, which created a legal regime amongst state actors in space, could prove vastly insufficient when addressing the new ways in which private citizens could be interacting with each other in frontiers of space. Tourists could be an especially volatile development, since they are not military-esque state actors that have generally been sent to space as the "envoys of mankind,"[18] nor would they even feel constrained by the rules and regulations of a private company with operations in space as an employee of that company might. Their interactions would most closely resemble interactions of the average citizen on earth where crime and other conflicts regularly occur.

2. Renewed interest in Moon exploration

The renewed interest in exploration and possible commercial exploitation of the moon and its resources is another development that enhances the need for clarification of jurisdictional rules. The United States, Great Britain,[19] China,[20] and Japan[21]

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[16] *Id.* at 22.

[17] Personal Space Flight Member Organizations, http://www.personalspaceflight.org/members.htm (last visited June 15, 2007).

[18] OST, *supra* note 3, at art 5.

[19] *See Joint Statement of Intent for Cooperation in the Field of Space Exploration by the United States National Aeronautics and Space Administration and the United Kingdom British National Space Centre*, U.S.- U.K., Apr. 4, 2007, http://www.nasa.gov/pdf/

have all expressed renewed interest in lunar exploration. Exploration of the moon as an economic resource could be big business for those involved. These nations' interest is rooted in "industrial competitiveness that could lead to securing rights to acquire resources in outer space in the future."[22] For example, China's space policy is based around its desire to "develop its economy and continuously push forward its modernization drive."[23] Attenborough's principle on space tourism can be applied to the interest in exploiting the resources on the moon: if it is commercially feasible, the private sector will get involved. This investment could lead to large numbers of private individuals interacting on the moon. These private individuals are cause for concern. The companies they will work for are currently well regulated under national laws, however the discrete individual is left to guess at what law applies and where.

II. THE LAW APPLICABLE IN OUTER SPACE

While space law itself is not a "coherent or self-contained body of law," its main source is international law.[24] Article 3 of the OST states that state parties will act "in accordance with international law, including the Charter of the United Nations."[25] Outside the five space treaties, general international

174684main_Signed_Joint_Statement.pdf (specifically addressing future moon exploration by the two countries).

[20] Marc Kaufman, *NASA Chief Says China May Make It to the Moon*, THE WASHINGTON POST, March 16, 2007, at A06.

[21] Japan Aerospace Exploration Agency, *JAXA Vision - JAXA 2025,* at ii-iii, *available at* http://www.jaxa.jp/about/2025/index_e.html (last visited June 15, 2007). Japan seeks specifically is seeking to create a lunar base as it considers exploration of the moon the "as the first step in efforts to broaden the horizon of human activities" in space. *Id.* at 31.

[22] *Id.* at 32.

[23] Yin Wenjuan, *Presentation made by Ms. Yin Wenjuan At the UN/Republic of Korea workshop on Space Law*, *in United Nations treaties on outer space: actions at the national level*, PROCEEDINGS OF THE UNITED NATIONS/REPUBLIC OF KOREA WORKSHOP ON SPACE LAW, U.N. Office of Outer Space Affairs, ST/SPACE/22, at 31 (Daejeon, Republic of Korea, Nov. 3-6, 2003) *available at* http://www.unoosa.org/pdf/publications/st_space_22E.pdf.

[24] PHILLIP DANN, *The Future Role of Municipal Law in Regulating Space-related Activities*, *in* SPACE LAW: VIEWS OF THE FUTURE 125 (Tanja L. Zwaan eds., Kluwer 1988).

[25] OST, *supra* note 3, at art. 3.

law is the governing law in space. The sources of international law are stated in the Statute of the International Court of Justice, which is "widely recognised as the most authoritative statement as to the sources of international law."[26] The Statute states that the court in deciding disputes shall apply:

> (a) international conventions, whether general or particular, establishing rules expressly recognized by the contesting States;
>
> (b) international custom, as evidence of a general practice accepted as law;
>
> (c) the general principles of law recognized by civilised nations;
>
> (d) subject to the provisions of article 59, judicial decisions and the teachings of the most highly qualified publicists of the various nations, as a subsidary means for the determination of the rules of law.[27]

Of the four sources recognized by the Statute only three are binding on the court, and these are the ones that can be seen as substantive international law. The other items, judicial decisions and the teachings of scholars, are only persuasive. This paper will deal primarily with law made through international conventions and international custom.

The general principles of law as a source of international law have a "fairly limited scope" in determining actual principles of international law.[28] These principles usually represent very broad and indefinite determination; this is especially true when it comes to things such as jurisdiction and criminal acts. For example it can be assumed that murder is illegal in all legal systems, but the constituent elements of murder may differ dramatically from one system to the next, leaving no concrete international definition for the term. Procedure is one of the

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[26] MALCOLM N. SHAW, INTERNATIONAL LAW 55 (Cambridge University Press 4th ed. 1997).

[27] Statute of the International Court of Justice art. 38(1), June 26, 1945, T.S. 993. *available at* http://www.icj-cij.org/documents/index.php?p1=4&p2=2&p3=0#CHAPTER 11.

[28] SHAW, *supra* note 26, at 78.

"most fertile fields" for development of international principles from general principles of law.[29] This would include jurisdictional determinations, but these also vary drastically across practice of the states. Therefore, jurisdictional bases must be examined from perspective of those customarily accepted within the international framework.

It should also be noted, that municipal law from the individual states is an active legal force in the arena of outer space and "its relative importance is likely to increase."[30] Most importantly, while jurisdictional bases are accepted through custom and state practice, for a court to exercise that jurisdiction domestically it must be a valid basis in the domestic law of the particular state. Municipal law, while exceedingly important to space law, can result in a patchwork of norms that are not uniform in outer space.

III. CRIMINAL JURISDICTION UNDER INTERNATIONAL LAW

A. Customary International Law

Criminal Jurisdiction can be a slippery thing: a crime can be blatantly committed, but if there is no entity with jurisdiction to prosecute the crime then it can go unpunished. Furthermore, due to the internationally accepted principle of *nullum crimen sine lege* and the invalidity of *ex post facto* proceedings, obvious bad acts can go unpunished due to there being no law proscribing that particular act.[31] Customary international law recognizes five bases for criminal jurisdiction: "territorial, nationality, protective, passive personality, and universal."[32] Additionally, for a state to prosecute, the basis of jurisdiction must be an accepted part of that state's domestic law.

Territorial jurisdiction is the first and most often invoked principle because "[o]ne of the main functions of a state is to

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[29] *Id.* at 79.

[30] DANN, *supra* note 24.

[31] ANTONIO CASSESE, INTERNATIONAL CRIMINAL LAW 139-145 (Oxford University Press 2003).

[32] Sinha, *supra* note 7, at 93.

maintain order within its own territory."[33] This type of jurisdiction can apply when the criminal conduct occurred in part or in whole within the territory of a state. The key inquiry is whether a "constituent element of the offense occurred" in the state's territory.[34] It should be remembered that the *lex loci* is controlling, thus a person can be convicted of criminal conduct in a foreign state even if the same conduct is not criminalized in that person's home state.[35] Many states, though, have extended this principle to include "offences committed abroad which merely produce effects on [or in] their territory."[36] This innovation has allowed states to extend their jurisdiction over criminals outside their territory. A classic example would be a defamatory statement made and communicated to another in state X. If the person defamed suffers damage in state Y, then state Y could claim jurisdiction over the offender. This approach has been criticized as leading to a "slippery slope which leads away from the territorial principle towards universal jurisdiction."[37] It is essentially a problem of line drawing in which Michael Akehurst (in his seminal article on jurisdiction under international law) argues that only the country where the "primary effect is felt" can claim jurisdiction.[38] A primary effect rule would limit jurisdiction, but Akehurst gives no test for determining what the primary effect constitutes. Arguments could be made both for a temporal test or a gravity of harm test and conflicting claims to jurisdiction could easily result. This doctrine has "provoked considerable controversy" and is now generally limited to cases where asserting jurisdiction is considered "reasonable" in light of a balancing test.[39] The principle could be important if a crime were committed in space and had effects within the terrestrial borders of a state.

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[33] Michael Akehurst, *Jurisdiction in International Law*, 46 BRIT. Y.B. INT'L L. 145, 152 (1972-73). Akehurst notes that while civil law countries rely much more heavily on the nationality principle than do common law countries, the territorial principle remains the most heavily relied on basis in civil as well as common law countries. *Id.*

[34] *Id*.

[35] *Id.* at 154.

[36] *Id.* at 153. These effects need not be a constituent element of the crime. *Id.*

[37] *Id.* at 154.

[38] *Id.*

[39] SHAW, *supra* note 26, at 484-85.

The second basis for criminal jurisdiction under international law is that of nationality. Nationality allows a state to exercise jurisdiction over crimes of its nationals committed abroad. Different states exercise different limitations to this type of jurisdiction; for example some states "require proof that the act is also criminal under the *lex loci*, or restrict jurisdiction to serious crimes or cases where the injured party or his government request prosecution."[40] This of type jurisdiction only applies to the accused national and does not extend jurisdiction over his alien accomplices.[41]

Thirdly, states may turn to the protective principle in order to assert jurisdiction. This covers acts "committed by aliens abroad which threat[en] the state."[42] The doctrine, though, must be limited in such a way that it prevents a state from imposing its ideology on "aliens living in foreign countries."[43] Akehurst again argues for a "primary effect" test by which it must be shown that the "*primary* effect of the accused's action was to threaten that state."[44] This test looks to the intent of the accused, and is particularly relevant to the current problem of global terrorism in which states are attempting to extend jurisdiction over terrorist cells that function outside the borders of the state.

Next, there is the universality approach, which originates in the "centuries" old rule that any state may try pirates.[45] Universal Jurisdiction is asserted "solely on the nature of the crime."[46] Piracy was the first crime to have this sort of jurisdiction applied to it. Since it "originates from nonsovereign territory (i.e. the sea), it is a threat that cannot be countered by the

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[40] Akehurst, *supra* note 33, at 158. It should be noted that such limitations are not required under international law: "a state has an unlimited right to base jurisdiction on the nationality of the accused." *Id.*

[41] *Id.*

[42] *Id.* at 157-58.

[43] *Id.* at 159.

[44] *Id.*

[45] *Id.* at 160.

[46] PRINCETON PRINCIPLES ON UNIVERSAL JURISDICTION, at princ. 1(1) (Stephen Macedo ed., Princeton 2001).

practice of sovereign protection of domestic territory."[47] Universality was applied to piracy because states felt a need to "fight jointly" against it due to piracy's adverse effects on all states.[48] It was later used in the 1949 Geneva Conventions in relation to war crimes and also in the 1984 Convention Against Torture on the grounds that states should "protect *universal* values."[49] This new rationale reflected the view that there were some crimes of such "gravity and magnitude" that the whole of society should work to prevent them.[50] It is, however, a controversial form of jurisdiction due to the uncertainty as to exactly which crimes fall under it. While it is affirmatively codified in some treaties, it is also generally extended to *jus cogens* criminal offenses.[51] It is problematic "that every individual is or may be subject to the laws of every State at all times and in all places,"[52] but this is only so if "the laws vary from place to place, if they are the same in all countries the individual suffers little hardship."[53] *Jus cogens* offences are the only offences that can be said to universally fit this paradigm, as they are prohibited in all jurisdictions as violations of international law. While there is not an exhaustive list of these offenses, some accepted ones could be committed in space (e.g. piracy or torture). Furthermore, it could be argued that the ideals set out in the OST that outer space should only be used for "peaceful purposes" has entered into customary international law,[54] and that a violation of this principle could constitute a *jus cogens* offense.

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[47] MARK B. SALTER, RIGHTS OF PASSAGE: THE PASSPORT IN INTERNATIONAL RELATIONS 17 (Lynne Riemer Publishers 2003).

[48] CASSESE, *supra* note 31, at 284.

[49] *Id.* at 284-5.

[50] *Id.* at 285.

[51] The content of *jus cogens* is under debate due to the stringent nature of their development. SHAW, *supra* note 26, at 97-98. The Princeton Principles list piracy, slavery, war crimes, crimes against peace, crimes against humanity, genocide, and torture as crimes covered, but this list is not treated as exhaustive and allows for other unspecified crimes. PRINCETON PRINCIPLES, *supra* note 46, at princ. 2.

[52] Akehurst, *supra* note 33, at 165 (citing J.L. Brierly, *'Lotus' Case*, 44 L.Q.R.154,161 (1928)).

[53] *Id.*

[54] BIN CHENG, STUDIES IN INTERNATIONAL SPACE LAW 125-149 (Clarendon Press 1997).

Finally, the most controversial innovation of the jurisdictional regimes in international law is that of passive personality. Passive personality allows a state to extend jurisdiction over "any act committed outside its territory by a foreigner which substantially affects the person or property of a citizen."[55] The difference between the passive personality principle of jurisdiction and the protective principle is that the protective principle allows a state jurisdiction when the state itself is threatened, whereas passive personality allows a state to extend jurisdiction over "crimes committed abroad against [its] own nationals."[56] The principle reflects the states interest in "the need to protect nationals living or residing abroad" and "a substantial mistrust in the exercise of jurisdiction by the foreign territorial state."[57] Generally, this principle is limited by states in that it requires "double criminality," i.e. the act is a crime in both the state in which it was committed and in the state which is exercising jurisdiction.[58] This is also a requirement of extradition, and it works as an effective limitation when the accused is still abroad.[59] This type of jurisdiction, however, is seen by many as "dubious ground" for jurisdiction and has been opposed by the United States and the United Kingdom.[60] However, it has recently been more widely accepted for certain crimes, especially those dealing with terrorism.[61]

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[55] GLENN REYNOLDS & ROBERT MERGES, OUTER SPACE: PROBLEMS OF LAW AND POLICY 277 (Westview Press, 2nd ed. 1997).

[56] CASSESE, *supra* note 31, at 282.

[57] *Id.* (emphasis removed).

[58] *Id.*

[59] *Id.* at 282-3.

[60] SHAW, *supra* note 26, at 467. There are a few federal laws in the US that allow for such jurisdiction such as 18 U.S.C. 7(7) (2006), which grants jurisdiction in "any place outside the jurisdiction of any nation with respect to an offense by or against a national of the United States."

[61] SHAW, *supra* note 26, at 468. *See also* United States v. Yunis, 924 F. 2d 1086, 1091 (C.A.D.C. 1991) (holding that both universality and passive personality to be proper in grants of jurisdiction over plane hijackers whose only connection to the US were the presence of US citizens on the plane).

B. Treaty Law

States may also use treaties to allocate criminal jurisdiction. For the purposes of space law there are four treaties particular to space that are pertinent. They are the OST; the Registration Convention;[62] the Moon Agreement; and the ISS Agreement[63]. Also pertinent is the Rome Statute[64] establishing the International Criminal Court and the impact that it could have on criminal jurisdiction in space.

The OST was the initial treaty that was passed by the United Nations at the dawn of Space Exploration. One of its most important functions is to distinguish space as the "province of all mankind."[65] Further, it declares that space shall not be "subject to national appropriation by claim of sovereignty, by means of use or occupation."[66] It, in essence, sets space aside as an extra-jurisdictional territory. This does not preclude states exercising "jurisdiction and control over people, institutions, and objects in outer space."[67] The only jurisdiction that the OST affirmatively recognizes is that of a state over an "object launched into outer space . . . and over any personnel thereof, while in outer space or on a celestial body."[68] Thus, the OST does not comment on jurisdiction outside space objects or personnel, except to "designate international law as applicable to space activities."[69] In reading articles 6 and 8 together it is implicit that

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[62] Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

[63] Agreement Among the Government of Canada, the Governments of the Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation and the Government of the United States of America Concerning Cooperation on the Civil International Space Station, State Dept. No. 01-52, Jan. 9, 1998, *available at* 2001 WL 679938 [hereinafter ISS Agreement].

[64] Rome Statute of the International Criminal Court, June 17, 1998, 2187 U.N.T.S. 90 [hereinafter Rome Statute].

[65] OST, *supra* note 3, at art. 1.

[66] *Id.* at art.2.

[67] STEPHEN GOROVE, *Legal Problems of Manned Space Flight*, *in* THE USE OF AIRSPACE AND OUTER SPACE FOR ALL MANKIND IN THE 21ST CENTURY 246 (C.J. Cheng ed., Kluwer 1995).

[68] OST, *supra* note 3, at art. 8.

[69] Mary McCord, *Responding to the Space Station Agreement: The Extension of U.S. Law into Space*, 77 GEO. L. J. 1933, 1936 (June 1989). McCord also notes that the treaty is silent as to the extent that domestic law applies in space. *Id.*

states have the authority to exert jurisdiction over individuals in space, but as argued below, this is not generally done in an effective manner. Furthermore, the extent to which states must supervise these non-governmental entities is uncertain as "the minimum degree of control of a nation-state over its private 'national' space object remains . . . barely touched by the 1967 Treaty" and subsequent ones.[70] The OST was followed by the Registration Agreement, which requires states to register "space objects" that they launch into outer space "in an appropriate registry."[71] It is the state of registry that exercises jurisdiction over any given space object.[72] This only adds to the OST by acknowledging that, when there are multiple launching states, states may allocate jurisdiction over the space object through agreements concluded between the launching states.[73]

The last of the five general space treaties passed by UNCOPUOS is the Moon Agreement. It adds very little to the jurisdictional regime in space established by the other treaties. This is especially so in light of its low number of state parties.[74] It, like the OST, establishes that the moon and other celestial bodies are to be used only for "peaceful purposes."[75] In light of this, it prohibits states from establishing military bases on the moon, which could have ramifications in the area of law enforcement.[76] Additionally, the Moon Treaty prevents the Moon from becoming the private property of "any state, international intergovernmental or non-governmental organization, national organization or non-governmental entity or of any natural person" even by the placement of structures on the moon.[77]

The ISS Agreement should be mentioned as it is the only positive source of criminal law that currently exists in outer

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[70] SIEGFRIED WIESSNER, *Human Activities in Outer Space: A Framework for Decision-Making*, *in* SPACE LAW: VIEWS OF THE FUTURE 14 (Tanja L. Zwaan ed., Kluwer 1988).

[71] Registration Agreement, *supra* note 62, at art. 2.

[72] GOROVE, *supra* note 67.

[73] Registration Agreement, *supra* note 62, at art. 2.

[74] As of Jan. 1, 2006 only 12 states have ratified the treaty. *See* Moon Agreement, *supra* note 9. All of the major space powers are conspicuously missing.

[75] Moon Agreement, *supra* note 9, at art. 3(1).

[76] *Id.* at art. 3(4).

[77] *Id.* at art. 11(3).

space.[78] It is not a general treaty; instead it represents the type of agreement envisioned under the Registration Agreement in which parties have allocated jurisdiction amongst themselves. The agreement, which governs the international space station developed by Canada, the European Space Agency, Japan, the Russian Federation and the United States, adopts a nationality approach to criminal jurisdiction on board. It grants each state jurisdiction "over personnel in or on any flight element who are their respective nationals."[79] It also includes elements of passive personality jurisdiction. If a crime "affects the life or safety of a national of another party" or "occurs in or on or causes damage" to another party's flight element (the station is made up of elements that are registered to the party that launched it), then injured states or the state of the injured party can request consultations.[80] If the state of the accused party refuses to either concur in granting jurisdiction to the aggrieved state or refuses to assert jurisdiction itself, then the aggrieved state may assert jurisdiction.[81] Of course, this criminal regime is only applicable on board the ISS and only to "personnel" on board. Unfortunately, the drafters of the agreement failed to define personnel, so the true extent of the jurisdiction is somewhat open ended, but the agreement does represent a significant step for dealing with these types of issues. This is especially so in that the first space tourists have been visiting the ISS.

Finally, a cursory look must be given to the Rome Statute of the International Criminal Court. Under this treaty some crimes can have jurisdiction taken up by a supra-jurisdictional International Criminal Court (ICC). However, due to the nature of these crimes they are unlikely to be committed in space. The court has jurisdiction over genocide, crimes against humanity, war crimes, and the crime of aggression.[82] Both genocide and crimes against humanity have scale requirements that are

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[78] For an in depth look at criminal jurisdiction on the ISS *see* Sinha, *supra* note 7.
[79] ISS Agreement, *supra* note 63, at art. 22(1).
[80] *Id.* at art. 22(2).
[81] *Id.* at art 22(2).
[82] Rome Statute, *supra* note 64, at art. 5.

unlikely to be met in outer space anytime in the near future.[83] For war crimes and crimes of aggression to occur in space one would have to presuppose a collapse of space law as now extant, since the OST states that space will only be used for "peaceful purposes."[84] Furthermore, for the ICC to gain jurisdiction over the accused the actions of the accused must occur within the territory of a state party or be a national of a state party.[85] If these sorts of crimes were to occur in space a referral to the ICC might be likely due to the nature of the investigation which many states would find too costly. While the Rome Statute is a pertinent piece of international criminal law its application to space seems remote, but could eventually have some impact.

C. Other Considerations

1. Enforcement

While somewhat outside the scope of this paper, a related issue to jurisdiction is the actual enforcement of the rule of law in space. While in the future there may be ample opportunity for a plethora of peoples to be able to gain access to outer space, it will most likely remain that only a very few governments will have extensive space programs in the initial years of the new space boom, creating two significant implications. First, the burden of enforcement of rules of law will fall upon the governments that have the resources to enforce them. Secondly, and following from the first, this could mean that there is a selective enforcement of laws in space, which will be biased in favor of the enforcing government.

Another, problem that might arise is that the government that is functioning as the enforcer in space could feasibly attempt to assert jurisdiction over crimes based on the fact that it

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[83] *Id.* at arts. 6 & 7. To be a crime that occurred only in the confines of space would require large groups of individuals to be in space. While one can come up with hypotheticals to meet the elements of these crimes in space, the application of the treaty would be quite remote.

[84] OST, *supra* note 3, at art. 4.

[85] Rome Statute, *supra* note 64, at art. 12. In addition to this, the Security Council can refer a case to the ICC, which would grant jurisdiction over a person or event. *Id.* at art. 13(b).

enforced the law i.e. that the only link between the state and the alleged criminal act is that the state enforced. Under the current jurisdictional regimes in customary international law (as discussed above) there must be "some genuine link between the state and the persons, property, or events over which jurisdiction is claimed."[86] The problems with this would be twofold. If claimed as a new form of jurisdiction it creates an atmosphere of "might makes right" in that only the powerful can claim criminal jurisdiction in space. On the flip side, if the state does not claim a new form of jurisdiction but instead tries to fit it into one of the already accepted regimes it could look as though that state were actually asserting a territorial claim on outer space. For instance, if a citizen of state X assaults a citizen of state Y and state Z enforces, then State Z would most likely apply its domestic law. The result is that even if it attempts to use the universality basis for jurisdiction it has actually created the precedent that its domestic assault law is applicable to all persons in the territory of space, effectively extending its control and jurisdiction in violation of the OST.

It is beyond the scope of this paper to discuss in depth the pros and cons of an international enforcement body for outer space, so suffice it to say that any such body is decades if not longer in the future. While such a body might be able to clear up difficulties in the enforcement area, its remoteness does not help to address the current needs of space exploration in which there is the probability of a wrongful act in space but not the necessity for a full time enforcement body.

2. Legislative Jurisdiction

While this paper is intended to primarily discuss the exercise of judicial jurisdiction, another related problem is that of legislative jurisdiction. States may not, due to the constraints of the OST, extend their jurisdiction over outer space. This includes legislative jurisdiction, which "refers to the supremacy of the constitutionally recognized organs of the state to make bind-

[86] REYNOLDS & MERGES, *supra* note 55, at 276.

ing laws within its territory."[87] This does not inhibit states from extending legislative jurisdiction over its nationals abroad. For instance, a state could make it illegal to for its citizens to chew gum in space. The state cannot, however, abuse the right to legislate, especially in such a way that would "infringe the sovereignty and independence" of another state.[88]

Complications arise when a state attempts to extend legislation over foreigners. It is not entirely clear whether a state, using passive personality, has violated the OST if it passes a law that makes it a crime for anyone to assault one of its citizens in space. Crimes are usually legislated on a territorial basis, thus a law such as this could be seen as an extension of a states jurisdiction into space. This legislative problem obviously creates a loop hole in which some acts could be crimes on Earth, and not in space (if a state has not properly extended its criminal statutes).[89] This creates a good argument for an international space code; but, like an international enforcement body, will be long in the making and is unlikely in the near future.[90]

D. Specific Problems

1. Mugging on the Moon

The most controversial of all the space treaties is the Moon Agreement. While the agreement has entered into force, it lacks the ratification of many major space powers, making it effectively powerless as a control on moon activities.[91] However, for the purposes of jurisdiction, the Moon Agreement added little to

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[87] SHAW, *supra* note 26, at 456.

[88] *Id.*

[89] *See* United States v. Cordova, 89 F. Supp. 298 (E.D.N.Y 1950) (holding that congress had not extended its Special Maritime Jurisdiction over airplanes, thus it could not exercise jurisdiction over an assault occurring in a plane over the high seas).

[90] *But see* George S. Robinson, *Astronauts and a Unique Jurisprudence: A Treaty for Spacekind,* 7 HASTINGS INT'L & COMP. L. REV. 483 (1983-84).

[91] Leslie Tennen, *Commentary on Emerging System of Property Rights in Outer Space in United Nations treaties on outer space: actions at the national level*, PROCEEDINGS OF THE UNITED NATIONS/REPUBLIC OF KOREA WORKSHOP ON SPACE LAW, U.N. Office of Outer Space Affairs, ST/SPACE/22, at 343 (Daejeon, Republic of Korea, Nov. 3-6, 2003) *available at* http://www.unoosa.org/pdf/publications/st_space_22E.pdf.

the regimes already put in place by the OST.[92] Stephen Gorove, in an early article, identified four areas in space where a crime can occur: "in outer space itself, that is in the void, or on board a spacecraft, space laboratory or another space object in outer space, or on such craft or on a celestial body or on a celestial body but not aboard such craft either within a particular facility or without it."[93] As seen in the discussion of the treaty law above, a space object with a registered launching state will be under the jurisdiction of at least one state, thus the concern here are crimes that could occur in the void of space or on a celestial body. Specifically, the Moon will be addressed as it is the most likely place where two humans might meet each other (though the problem could be similarly formulated if the crime were on another celestial body or in the void of space).

If a person from state X were to mug a person from state Y on the moon, it is feasible that no state could assert jurisdiction. The crime certainly occurs outside the territory of any state (and it would be absurd to claim that it affected the territory of either state) so the territoriality principle could not be asserted. The nationality principle might be used by state X in order to punish a national, but only barring any limitations that State X might have on the principle. For example, if state X will only use the nationality principle for serious offenses, then mugging may not rise to the level of seriousness required. Or, if state X limits itself to crimes that are also illegal in the *lex loci*, then it can not be said with certainty that mugging is illegal in the frontiers of space, as there is no *lex loci* in outer space as of yet. Indeed, a mugging in space might not even be illegal under state X's criminal code if the definition of the crime uses a territorial action as an element.[94] It should be noted that a state

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[92] The OST had already set the moon aside as an extra-jurisdictional zone. OST, *supra* note 3, at art. 2.

[93] Stephen Gorove, *Criminal Jurisdiction in Outer Space*, 6 INT'L L. 313 (1972).

[94] In order for a state to assert any basis for jurisdiction it must have properly legislated it into domestic law. For example, the criminal code of Western Australia holds that an offense is only committed under the code when "at least one of the acts, omissions, events, circumstances or states of affairs that make up those elements occurs in Western Australia." Criminal Code of Western Australia, pt. I div. III §12 (1)(b) (2004). Part (c) of this legislation does allow for the extraterritorial application of some laws, however it is highly unlikely that this jurisdiction has been extended by statute to a

could argue that theft by force is illegal in all legal systems and thus a violation of a general principle of municipal law, meaning that it could reasonably assert that there is double criminality. State Y will not be able to use the protective principle as a mugging will not significantly threaten the state (unless, for example, the mugged is carrying secret state documents). The crime is certainly not a *jus cogens* violation, so universality would not apply. Finally, passive personality might be asserted by state Y if it accepts such grounds for jurisdiction. However, many states would not assert this sort of jurisdiction for such a small violation of the criminal code. In addition, double criminality is often used as a limitation on passive personality. Even if state Y extended its criminal code to include a mugging in space, it could only properly do so over its nationals and its space objects; otherwise, it would be in violation of the OST by extending its jurisdiction into space in a territorial manner. The result is that state Y would lack sufficient grounds for asserting jurisdiction under passive personality.

If jurisdiction under the customary international law rules cannot be asserted a state could turn to the space treaties. These, could very well leave jurisdiction lacking also. Under the space treaties the only reasonable argument would be that the launching state or state of registry would have jurisdiction to prosecute, but under the language of the treaties that state only has jurisdiction over its space object and its personnel.[95] It could be argued that asserting jurisdiction over the mugger by state A would be acceptable as a proper supervision of a non-state entity, but this could be seen as lacking since this supervision applies to "national activities."[96] The exact meaning of national activities is unclear, but a stroll on the surface of the moon might be below the bar and be considered a private or non-national activity. It is unclear what "national activities" means and one commentator suggests that the term would not include

crime such as mugging. If State A were to have a criminal code of this sort it would be impossible for it to correctly assert jurisdiction.

[95] OST, *supra* note 3, at art. 8.

[96] *Id.* at art. 6. Furthermore, the definition of space activities is left largely undefined. *Id.*

activities "conducted by the nationals of a State when they are not within either its territorial or quasi-territorial jurisdiction."[97] Furthermore, the treaties mention nothing about what criminal code applies, thus the mugger is in danger of multiple and unexpected criminal codes being applied to him and the mugged is in danger of no code at all being applied.

2. The Launching Stateless Space Object

Similar problems could occur in the case of a space object that lacks a launching state. As stated by the Liability Convention, a launching state is the state that launches a space object, the state that procures the launching of a space object, or the state from whose territory or facility an object is launched.[98] It is possible for a space object to lack a launching state if it is launched by a private entity, from a private facility located in international waters or on Antarctica. Furthermore, there might not be a violation of international law if the entity is from a country that has not acceded to the OST or a country that has not implemented any domestic legislation to restrict its citizens from taking part in such an exercise.

The jurisdiction on this object would suffer from all the problems outlined in the problem of the mugging on the moon scenario, but additionally, there would be no launching or registering state that could even attempt to extend jurisdiction over the criminal.

IV. CIVIL LAW

A. Customary International Law

Civil law jurisdiction, as regulated under customary international law, is less controversial when exerted by domestic courts. This is because "the rules governing the Jurisdiction in

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[97] CHENG, *supra* note 54, at 238-39. According to Cheng, a person not on board a craft and not part of the personnel of that craft would be outside the quasi-territorial jurisdiction of the state. *Id.* at 232.

[98] Convention on International Liability for Damage Caused by Space Objects, art. 1(c), Mar. 29 1972, 961 U.N.T.S. 187 [hereinafter Liability Convention].

civil and criminal cases are founded in many respects on radically different principles."[99] As a result the same reasoning that gives a state jurisdiction in a criminal case will not necessarily give a state jurisdiction in a civil case.[100] In fact it has been argued that "the only limitation on jurisdiction in civil trials [is] contained in the principle of effectiveness."[101] In support of this argument Akehurst asserts that "states claim jurisdiction over all sorts of cases and parties having no real connection with them and that this practice has seldom if ever given rise to diplomatic protests,"[102] which is "partly due to the fact that public opinion is far more easily roused where a person is tried abroad for criminal offenses."[103] As a result "international law has tended to focus on penal rather than civil jurisdiction."[104]

Courts have used "far wider grounds than has been the case in criminal jurisdictional matters" to assert civil jurisdiction.[105] In common law states, the most prevalent basis for jurisdiction is service upon the defendant while within the borders of the state. This presence can be temporary, but it is based on a common law principle and may be seen as suspect in non-common law States.[106] Under common law, service of process on a defendant while that defendant is within territory of the jurisdiction of the court gives the court jurisdiction over that defendant. There is no set length of time for this presence, and "in theory a visit lasting a few seconds would be sufficient."[107] US courts have even held that the rule applies when the party is within the state "transiently," with one court even upholding

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[99] Akehurst, *supra* note 33, at 170 (internal cites omitted John Basset Moore).

[100] *Id.*

[101] *Id.*.

[102] *Id.*

[103] SHAW, *supra* note 26, at 457.

[104] Christopher L. Blakesley, *Criminal Law: The United States Jurisdiction Over Extraterritorial Crime*, 73 J. CRIM. L. & CRIMINOLOGY 1109 (1982).

[105] SHAW, *supra* note 26, at 457.

[106] Akehurst, *supra* note 33, at 171. Akehurst notes that civil law jurisdictions require service of process as a form of notice, but that the service does not create jurisdiction: "Jurisdiction must exist before a writ can be served." A judgment based on this type of jurisdiction "would almost certainly be refused recognition outside the common law world," but that there has been no protest that this jurisdiction is contrary to international law. *Id.*

[107] *Id.* at 170-71.

service on a defendant who was served while onboard an airplane over the state.[108] Obviously this basis of jurisdiction would have limited application in space. While onboard a government owned space vessel service may be seen as being made within the territory of the state.[109] It is not clear though whether a space vehicle owned by a private actor would become the *de jure* territory of its registry state or its launching state without domestic legislation declaring it as such.

In civil law countries the traditional basis of civil jurisdiction is often founded on habitual residence of the defendant within the state.[110] To some extent this basis has been undermined by courts that will assert jurisdiction based on a connection to the matter at hand (e.g., the tort occurred within the state); however, while there are good policy reasons for such assertions, it can hardly be accepted as the rule.[111] The idea, though, has gained in popularity and even common law states now use an array of tools in order to extend their jurisdiction. The leading example can be found in the United States Supreme Court case of *International Shoe v. Washington*[112] in which the court held that the "amenability of a party to a suit is based on the party's connection with the forum state."[113] However, the test is not a steep one and only requires "minimum contacts," but it does seek to determine the nature of the forum state's connection to the suit and the forum state's interest in the subject matter.[114]

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[108] Grace v. Macarthur, 170 F. Supp. 442 (E.D. Ark. 1959). These cases are usually dismissed due to *forum non conveniens.* Akehurst, *supra* note 33, at 71. *See also* Amusement Equip. Inc. v. Mordelt, 779 F. 2d 264, 265 (5th Cir. 1985) (noting that "the rule of transient jurisdiction has suffered a fate akin to that of the once proud but now extinct dinosaurs").

[109] *But see* Lauritzen v. Larsen, 345 U.S. 571, 583 (1952) ("the test of location of the wrongful act or omission, however sufficient for torts ashore, is of limited application to shipboard torts, because of the variety of legal authority over waters she may navigate").

[110] SHAW, *supra* note 26, at 458.

[111] Akehurst, *supra* note 33, at 175.

[112] Int'l Shoe v. Washington, 326 U.S. 310 (1945).

[113] Karen Robbins, *The Extension of United States Criminal Jurisdiction to Outer Space*, 23 SANTA CLARA L. REV. 627, 654 (1983).

[114] *Id.* at 652. An international formulation of this test can be found in the Nottebohm Case (second phase) (Liechtenstein v. Guatemala), 1955 I.C.J. 4; *See* Robbins, *supra* note 113, at 656.

A final basis of jurisdiction is that of *forum patrimonii,* which allows a state to exercise jurisdiction in cases where the defendant has assets within the country. While some states limit the jurisdiction of the court to those assets alone, others can take jurisdiction over ancillary matters that are unrelated to the assets.[115] The result of course can seem unjust as in the example of when "a tourist who left his slippers behind in a hotel bedroom" could find himself subject to unrelated suits within that jurisdiction.[116] Regardless of the strange outcome no state has made a protest against this sort of jurisdiction.[117]

If diplomatic protests are indeed the "acid test of the limits of jurisdiction in international law,"[118] it seems, though, that the only truly accepted limit to civil jurisdiction under international law is that of effectiveness. This is illustrated by the routine extension of jurisdiction of US Anti-Trust Laws. These laws have been held to have a significant extraterritorial effect, and while they have been met with some diplomatic protest they are still routinely applied. In fact many states have found the best way of dealing with these sorts of laws is by enacting laws that counter the effects of the US legislation within their own borders.[119] Additionally, the minimum contacts test generally only serve to determine whether a state can exercise jurisdiction, and not whether another state has better claim to jurisdiction. In the international context, this creates a situation in which the enforcement of a judgment becomes the limiting factor as to the validity of the judgment, because a foreign court would retain the right to review the jurisdiction before enforcing a judgment.[120]

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[115] Akehurst, *supra* note 33, at 171-72.

[116] *Id.* at 172.

[117] *Id.*

[118] *Id.* at 176. Akehurst notes that the few on record are isolated and that the "law must be taken to follow the general practice rather than the isolated protest." *Id. But see* D.W. Bowett, *Jurisdiction: Changing Patterns of Authority Over Activities and Resources* 53 B.Y.B.I.L. 1, 3-4 (1982).

[119] SHAW, *supra* note 26, at 486.

[120] An example of this sort of limitation at work is the Hague Convention on the Recognition and Enforcement of Foreign Judgments in Civil and Commercial Matters, Feb. 1, 1979, *available at* http://www.hcch.net/index_en.php?act=conventions.text&cid=78. Instead of addressing domestic jurisdiction this treaty grants the right to deny a judgment for a set of particular reasons. *Id.*at arts. 4-5. In so doing it

B. Treaty Law

As already stated the OST defines space as "the province of all mankind," and little more needs to be said about the ramifications of this premise.[121] The treaty does go farther in setting up civil liability rules than it does in stating any sort of criminal ones. In addition to the jurisdictional clause in Article 7, the OST also states that a state will have "international responsibility for national activities in outer space" even if those activities are carried out by a non-governmental entity.[122] In addition, it requires the state to authorize and supervise activities of non-governmental entities.[123] While this clause is attempting to assign liability for damage done by space activities, it can certainly be argued that by virtue of the fact that a state authorization implicitly puts that entity within the jurisdiction of that state by giving it a minimum contact. On the other hand, one could argue that this clause would only give jurisdiction over civil causes occurring during a "national activity" that causes damage giving rise to international responsibility - excluding an interpersonal contract violation or personal tort.[124]

The Liability Convention adds another dimension to the dilemma of civil jurisdiction. It assigns liability based on the idea of the launching state. The launching state can be the state that launches the object, the state that procures the launch of the object, the state from whose territory the object is launched, or the state that owns the facility from which the object is launched.[125] It is, theoretically, possible that there can be up to four launching states. It could be argued that any launching state is connected enough to the object that it could assert civil jurisdictions for acts thereon. But the jurisdiction clause in the OST grants jurisdiction to the state that registers the object which would then be controlled by the Registration Conven-

limits the jurisdiction of the contracting parties through effectiveness as opposed to an affirmative statement of jurisdiction.

[121] OST, *supra* note 3, at art 1.

[122] *Id.* at art 6.

[123] *Id.*

[124] *Id.*

[125] Liability Convention, *supra* note 98.

tion.[126] Thus, a distinction is necessary between the registering state, which has jurisdiction, and the launching state which (unless granted in an agreement between parties) lacks jurisdiction, but is still liable for damage. It should be noted that the Liability Convention only covers damage caused by space objects and not by individuals, thus its usefulness in extending jurisdiction further than the bounds of the space object are limited.

C. Other Considerations

An ancillary problem is that of choice of law. Virtually all judicial systems have a system of inquiry in place to help and determine which law to apply in its courts when there are multiple jurisdictions involved. This would change little in the space law context. The only significant change would be that there could be no line of questioning as to territory; however, the balancing tests that many jurisdictions use would simply take into account other features of the litigation in order to make their determination.

Choice of law could come into play if another court has to examine the enforceability of a judgment (enforcement being the only real limitation on civil law jurisdiction). This could lead to precedent being adopted in which certain contacts to a given jurisdiction are treated differently in the space law context.

D. Specific Problems

1. A Lack of Minimum Contacts

With the wide latitude of jurisdictional options for states in the civil matters the only real problem could be in a case that has a defendant without any minimum contacts. For instance, the case of a long term space resident that contracts to sell a piece of chattel property (that is in space) and then reneges, could create a fact pattern in which there are no minimum contacts which could allow a court to extend jurisdiction. The per-

[126] OST, *supra* note 3, at art. 7.

son lacks presence in a territory and could also feasibly lack domicile in any territory. The contract and breach were both completed in space and the property is also in space; therefore, there are no minimum contacts under which a state could extend jurisdiction. The only possibility would be if a state is able to extend jurisdiction over the person due to his citizenship or presence on a registered space craft.

2. Judgment Enforcement in Space

If the true limitation on jurisdiction is the ability to enforce the judgment then there is a distinct problem of the space resident. If a person has begun to permanently reside in space it might be impossible (short of the use of some sort of force) to enforce a judgment against that person. A person winning such a judgment would have no court to turn to in order to get the judgment enforced due to the lack of courts in space. The only option would be to search out any terrestrial assets that the space resident might still retain.

V. NATIONAL LAWS

Many nations have enacted national laws, under the OST duty to supervise, that extend a limited amount of jurisdiction into outer space. However, many nations with space programs are lacking these laws. For instance, India "has not put in place a law regulating space activities by Indian nationals and corporations within Indian Territory."[127] Most countries only have licensing schemes that help control the commercial aspects and questions of launching state status, but these generally do not make affirmative statements as to the extent of jurisdiction over the participants on these flights.[128] In fact, many of these stat-

[127] C. Jayaraj, *India's Space Policy and Institutions, in United Nations treaties on outer space: actions at the national level*, PROCEEDINGS OF THE UNITED NATIONS, REPUBLIC OF KOREA WORKSHOP ON SPACE LAW, U.N. Office of Outer Space Affairs, ST/SPACE/22, at 106 (Daejeon, Republic of Korea, Nov. 3-6, 2003) *available at* http://www.unoosa.org/pdf/publications/st_space_22E.pdf.

[128] Among these countries are Australia, Space Activities Act 1998, No. 123 (1998), *available at* http://www.unoosa.org/oosa/SpaceLaw/national/australia/space_activities_act_1998E.html; Brazil, Ministry of Science and Technology Brazilian Space Agency

utes only apply to an entity needing a license for launching space objects, reentry of space objects, and running facilities for launching or reentry of space objects. This section will address three national regimes that attempt to deal with the jurisdiction problem and the inadequacies of each.

A. United States

The current leader in space exploration is the United States,[129] and it follows that the US has a highly developed legal system for its outer space activities. In the realm of jurisdiction the US has extended some extraterritorial jurisdiction that reaches into space through its Special Maritime and Territorial Jurisdiction legislation. Under this law, jurisdiction extends to:

> Any vehicle used or designed for flight or navigation in space and on the registry of the United States pursuant to the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies and the Convention on Registration of Objects Launched into Outer Space, while that vehicle is in flight, which is from the moment when all external doors are closed on Earth following embarkation until the moment when one such door is opened on Earth for disembarkation or in the case of a forced landing, until the competent authorities take

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Administrative Edict N. 27, June 20, 2001, *unofficial translation available at* http://www.unoosa.org/oosa/SpaceLaw/national/brazil/administrative_edict_27_2001E.html; The Russian Federation, Law of the Russian Federation, *About Space Activity*, Decree No. 5663-1 of the Russian House of Soviets, *unofficial translation available at* http://www.unoosa.org/oosaddb/showDocument.do?documentUid=312 (the Russian code does affirmatively extend its laws on board its vessels); South Africa, Space Affairs Act 1993, *available at* http://www.unoosa.org/oosa/SpaceLaw/national/south_africa/space_affairs_act_1993E.html; United Kingdom, Outer Space Act chap. 38 (1998), *available at* http://www.unoosa.org/oosa/SpaceLaw/national/united_kingdom/ outer_space_act_1986E.html; and Ukraine, Ordinance of the Supreme Soviet of Ukraine, On Space Activity, Law of Ukraine, Nov. 15, 1996, *unofficial translation available at* http://www.unoosa.org/oosa/SpaceLaw/national/ukraine/ordinance_on_space_activity_1996E.html. For an overview of these types of laws *see* United Nations Committee on Peaceful Uses of Outer Space (UNCOPUOS), Legal Sub-Comm., *Review of existing national space legislation illustrating how states are implementing as appropriate, their responsibilities to authorize and provide continuing supervision of non-governmental entities in outer space*, UN A/AC.105/C. 2/L. 224 (Apr. 2001).

[129] Japan Aerospace Exploration Agency, *supra* note 21, at 32 (noting the United States "represents eighty percent of the total investment in space activities").

> over the responsibility for the vehicle and for persons and property aboard.[130]

The extension of jurisdiction by this law is in line with the Outer Space treaties, but it is not entirely clear as to how far it extends. Jurisdiction is most certainly accorded to the United States on a vehicle, but there is no comment as to the effects of the doors of the craft being opened in space. Furthermore, the initial clause functionally extends jurisdiction over "any vehicle used or designed for flight or navigation in space." The jurisdiction applies to the territory of the craft and not to the territory outside the craft, thus the result is that a person who leaves the craft also leaves the jurisdiction of the United States.[131] So, in the mugging scenario, if the mugger had been on a US space object he would have left the jurisdiction of the US. The US could still use its extraterritorial jurisdiction that applies to international spaces, but if the neither the mugger nor the victim were US citizens,[132] the mugger would be immune from prosecution, because US courts will refuse to enforce extraterritorial jurisdiction without evidence of specific Congressional intent.[133] Therefore, a crime committed by a space traveler who was not personnel or a US citizen but had left the confines of US space object would be outside US jurisdiction.

One must look further into the US legislation to find any other sort of jurisdictional connections extended to space travelers. The Commercial Space Launch Activities Act requires an entity (not necessarily an individual person) to get a license in order to launch or reenter a space vehicle or to operate a site in

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[130] 18 U.S.C. §7(6) (2006).

[131] This sort of jurisdiction has been held to extend to an Arctic iceberg in a manslaughter case. *See* United States v. Escamilla*,* 467 F. 2d 341 (4th Cir. 1972) (the en banc appeals court was equally divided on the issue of jurisdiction and therefore upheld the decision of the lower court to exercise jurisdiction.) *But see* Smith v. United States, 507 U.S. 197, 204 (1993) ("we assume that Congress legislates against the backdrop of the presumption against extraterritoriality.")

[132] 18 U.S.C. §7(7) (2006).

[133] *See* McCulloch v. Sociedad Nacional de Marineros, 372 U.S. 10, 20-21 (1963) (looking for and finding no "construction which would exert United States jurisdiction over and apply its laws to the internal management and affairs of the vessels here flying the Honduran flag, contrary to the recognition long afforded them not only by our State Department but also by the Congress.").

the business of doing so.[134] This license is needed both inside the territory of the US and also for a US citizen outside of the US. The obvious effect and purpose is to regulate which space objects the US will be classed as a launching state, but it leaves out any reference to jurisdiction over those that are aboard the vehicle. Interestingly, this particular code has been augmented by recent regulations passed by the Federal Aviation Administration (FAA), The Human Space Flight Requirements for Crew and Space Flight Participants (a regulation with a direct bearing on the space tourism industry), makes no mention of any jurisdictional issues.[135] In fact, these regulations are more inclined towards "protect[ing] the uninvolved public,"[136] than the participants who "travel at their own risk"[137] and are required only to waive any claims against the US.[138]

B. Sweden

Swedish law is representative of the most common type of legislation used to supervise nationals in outer space. The Swedish Act on Space Activities requires a license in order to take part in space activities in the territory of Sweden or by a "Swedish natural or juridical person" even if not in the territory of Sweden.[139] Significantly, there is a penal punishment if this act is violated.[140] Space Activities, according to the Decree on Space Activities, are to be controlled by the National Board of Space Activities.[141] This control is as close to a comment on jurisdiction that can be found in the Swedish laws. The act is un-

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[134] 429 U.S.C. §70104(a) (2006).

[135] Human Space Flight Requirements for Crew and Space Flight Participants, 71 Fed. Reg. 75616 (Dec. 15, 2006) (to be codified at 14 C.F.R. 401ff) [hereinafter Human Space Flight Requirements].

[136] WALL STREET JOURNAL ONLINE, *supra* note 1.

[137] *Id.*

[138] Human Space Flight Requirements, *supra* note 135.

[139] Act on Space Activities, § 2 (1982:963), *unofficial translation available at* http://www.unoosa.org/oosaddb/showDocument.do?documentUid=318&level2=none&node=SWE1970&level1=countries&cmd=add.

[140] *Id.* §5. Either a fine or imprisonment of up to a year. *Id.*

[141] Decree on Space Activities, § 2 (1982:1069), *unofficial translation available at* http://www.unoosa.org/oosaddb/showDocument.do?documentUid=319&level2=none&node=SWE1970&level1=countries&cmd=add.

clear as to whether each individual taking part must gain a license or if a license can be granted to a company. Presumably (by the use of the word "party" instead of person in §2) a company could gain a license which would then leave open questions of jurisdiction for individuals. This is of particular import because Virgin Galactic has built its first space port in Sweden.[142] Whether or not each individual space tourist will have to gain a space license is questionable, because the term "space activities" is not specifically defined, making it difficult to determine whether mere transit through space is a space activity or not. In the end the Swedish law is not definite enough to solve jurisdictional problems.

Swedish law might soon be changing, though. Sweden has signed a deal with Virgin Galactic for Spaceport Sweden to be used for Virgin Galactic flights to observe the Aurora Borealis. Part of the agreement calls for the Swedish Government to enact a regulatory regime that is modeled on the United State's.[143] The goal of this probably has more to do with safety regulations than with jurisdictional issues.

C. Finland

Even though Finland can not be classed as a space power, the Finnish Penal Code is a fine example of a criminal code that has jurisdictionally been extended into outer space. Instead of including territorial requirements in the elements of the individual crime, the Finnish code makes a blanket jurisdictional statement at the beginning of the code effectively extending its entire criminal law. First, the Finnish code uses the passive personality principle to extend its jurisdiction over crimes committed against its citizens, but only if that crime is punishable by more than six months imprisonment.[144] Similarly, the nationality principle has been codified, but if the crime is committed outside the territory of any state the act again must be punish-

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[142] Peter de Selding, *Virgin Galactic Strikes Deal with Swedish Government*, SPACE.COM, Jan. 28, 2007, http://www.space.com/news/070128_sweden_virgin.html.

[143] *Id.*

[144] The Penal Code of Finland, at Chap. 1.§5 (2003), *unofficial translation available at* http://www.finlex.fi/pdf/saadkaan/E8890039.PDF.

able by more than 6 months imprisonment.[145] The Finnish code also extends over what it deems to be international offences:

> Finnish law applies to an offence committed outside of Finland where the punishability of the act, regardless of the law of the place of commission, is based on an international agreement binding on Finland or on another statute or regulation internationally binding on Finland (*international offence*).[146]

Finland could use this provision to extend its law into outer space in order to supervise in accordance with the OST. This section of the code could only be used to apply the criminal code to space travelers that are either on board space objects for which Finland is a launching state or Finnish nationals, as it has no obligation to supervise others in space. There would still be limitations depending on how one defines "national activities" as used in the OST.

VI. PROPOSALS

A. Suggestions from other scholars

1. Astrolaw

George Robinson, in his article "Astronauts and a Unique Jurisprudence: A Treaty for Spacekind," calls for a specific treaty to address the legal problems that may occur between individuals in space.[147] He cites research that states that the space environment could cause different human reactions due to the biological effects of the space environment on the human body.[148] To deal with this particular problem he proposes a treaty that allows space inhabitants to create the law that is applicable to their unique situation.[149] In addition to dealing with the specific biological effects of space, he claims that his proposal will allow for a new type of law that will reflect the

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[145] *Id.* at Chap.1 §6(1).
[146] *Id*. at Chap. 1. §7(1).
[147] Robinson, *supra* note 90, at 494.
[148] *Id.* at 485.
[149] *Id.* at 494.

cultural differences of astronauts.[150] His proposed treaty allows for an expert academy, as part of the UN, to create law (including jurisdiction for Spacekind, as opposed to Earthkind).[151]

Robinson's assertion that "Earth-indigenous laws, as cultural institutions, have evolved hand in glove with human biological evolution" is a useful reminder for future space legislation, but his proposed treaty fails to cope with the current problems of space travel.[152] Actual space societies are far in the future, thus making the potential for any sort of treaty specifically regulating those societies irrelevant as present. Man's emergence into space will be slow and methodical due to the risk involved and the most acceptable rules in the initial stages of space exploration will be the extension of terrestrial rules into space. Robinson's proposal is not without value, and in time could be particularly useful when dealing with the problems of long term or even permanent space residents; however, it does not cure regulatory problems for Earth residents entering outer space.

2. Minimum Contacts as a Basis for Criminal Jurisdiction

Reacting to the Special Maritime Jurisdiction Act of the United States, Karen Robbins suggests the adoption of a minimum contacts approach for criminal cases in space (such an approach would already be used in US for civil cases).[153] Her argument is that the extraterritorial jurisdiction legislation that the US has passed is inadequate and confusing. She suggests that due to the "unusually complex set of possibilities" in outer space a minimum contacts test in which a court determines, for the purposes of jurisdiction, "the nature and degree of the accused's connection with a nation and the interest the nation in the subject matter."[154] She claims that by basing jurisdiction on a multiplicity of factors, the best jurisdictional results are reached.

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[150] *Id.* at 493.
[151] *Id.* at 499.
[152] *Id.* at 484.
[153] Robbins, *supra* note 113.
[154] *Id.* at 652.

There are shortcomings to the test, however. Its traditional role has been in the civil law jurisdiction and its application to criminal law in this case would be unique.[155] The major shortcoming to this test is that it could result in the application of criminal laws to parties that would not expect those laws to be applied to them. If a state were to determine that it had jurisdiction to try a crime that occurred between two non-citizens then that state's law could suddenly be imposed on a party that was unaware it applied. Furthermore, if a state decided it had "minimum contacts" it could assert jurisdiction over a state that might have more contacts leading to potential friction between the two states. Minimum contacts is effective in the realm of civil law due to the sparse diplomatic objections to its exercise. Since the test seeks to determine whether a state has jurisdiction at all and not whether it is the best court to be asserting jurisdiction, in the criminal law arena it would lead to uncertain results causing numerous diplomatic problems.

3. Space Crimes as Piracy

One final proposal was made by C. Wilfred Jenks in his book, *Space Law*. He argues that violent acts in space should be considered as acts of piracy and thus subject to universal jurisdiction. He argues that though piracy was originally a maritime offence, it is not necessarily an exclusively maritime offense.[156] He cites authority that endorses the extension of piracy to the realm of air and other extraterritorial areas to support his thesis.[157]

Piracy might, in the future, be a crime that could occur in the realm of outer space and at that point the extension of universal jurisdiction to such acts would be proper. The extension of universal jurisdiction to "violent acts" in space is a bit far reaching and ill defined. It is the indefiniteness as to what would then constitute a violent act that would constitute piracy

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[155] *Id.* at 654. *See also* McCord, *supra* note 69, who endorses the test for use on the ISS.

[156] C. WILFRED JENKS, SPACE LAW 292 (Stevens & Sons 1965).

[157] *Id.* at 292-93.

that is problematic for Jenks' proposal. Definite laws are desirable and this proposal, while interesting, comes up short in addressing the complexities of criminal law and the competing interests that states retain in its application.

B. Proposed Space Visa

It is not argued that states are powerless to control people in the bounds of outer space, instead that the framework for this control is currently absent. At best there is a patchwork of jurisdiction with numerous holes. While a seamless jurisdictional regime is distant at best, a uniform international system for dealing with jurisdictional issues is not an impossibility.

As is often recognized, definite rules and regulations can help to encourage private sector investors. The nebulous nature of exactly what jurisdiction applies in space could be seen as a restraint of obstacle to private investors who would like to invest in space explorations. Also, knowing what law applies, to whom, and where would be highly beneficial for private citizens who enter space. While such determinations can be made quite easily within the confines of a registered space object, the jurisdictional lacunae will cause problems. This is particularly true when it comes to moon exploration where there will be a significantly higher likelihood of two people meeting in a non-space object context. Furthermore, the "function of State Jurisdiction in outer space, as elsewhere, is to maintain legal order and stability. The growing importance of rules governing the exercise of state jurisdiction over space activities parallels the development of the exploitation of outer space."[158] Currently, order is only present on board space objects, and while this has yet to actually create a problem, it would be advisable to be prepared for such a problem when it occurs rather than be caught unawares. The absence of jurisdictional rules compounded by emerging private interests in space creates a "great urgency for a national legal authority in space to be well-defined, comprehensive, and yet flexible enough to accommodate emerging patterns of extra-

[158] CSABAFI, *supra* note 4, at xvii.

terrestrial interaction between nations."[159] The proposed space visa fulfills the three requirements for criminal jurisdiction and it helps to supplement civil jurisdiction by creating at least one state with sufficient contacts to an individual in space.

The space visa is apt for a variety of reasons. While it could be titled a license or permit, the analogy of the visa is particularly appropriate due to the emerging focus on space tourism and the existing parallels between space tourism and terrestrial tourism. The visa is used to control the flow of peoples over international boundaries and airports often serve as the border area in which passports and visas are presented. A spaceport will serve the same functions as an airport and it, similarly, should also be treated as a boundary area for people passing into space, thus the space visa will fits neatly into an preexisting and internationally accepted regime. The space visa itself would function in the same way that a terrestrial visa functions. It would be granted by a state and affixed in a traveler's passport. It would then be stamped upon exit to and re-entry from space by a border control agent. Each state could implement its own visa system and accompanying set of conditions, and could extend the visa to any class of people that they deemed fit (including foreigners). The criminal and civil codes of a nation would be applicable to the visa holder at all times while in space. This creates a situation in which no one would be able to enter a jurisdictional lacunae, because there would constantly be a jurisdictional authority to which that person had subjugated himself.

State control over citizens is a desirable element of space exploration, but this control cannot be linked to the appropriation of any territory of outer space. Therefore, it is necessary to develop "special rules governing the exercise of jurisdiction in outer space."[160] It is proposed that a space visa should be developed, which a person must obtain before entering outer space. While numerous countries already employ licensing schemes, they are intended to deal more with commercial liability than

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[159] Robbins, *supra* note 113, at 653.

[160] CSABAFI, *supra* note 4, at 52.

with jurisdictional matters and often come at a high cost.[161] Visas, on the other hand, are "government-issued travel documents that grant foreigners the right to travel to and enter" another territory.[162] The space visa would allow an individual to submit to a particular domestic law regime. This would be the controlling law on the person throughout the outer space journey (except, of course, when on board a properly registered space object which would retain its jurisdiction as granted by the OST). Additionally, it would allow states to fulfill their duties to supervise non-governmental entities in space as required under the OST.[163] State responsibility promotes "responsible state regimes" that can be "expressed and manifested by domestic licensing or other authorization mechanisms."[164] A space visa, therefore, would be a valid use of state power to implement a responsible regime in order to supervise private actors in space.

The space visa, which could be attached to a passport (much like any terrestrial visa), would have numerous advantages. One of the largest would be its relative ease of implementation. It is reasonable to assume that "control over space will not, in the foreseeable future, be relinquished by sovereign nations to an international authority."[165] Due to the lack of a central legislative body in the realm of international law, lawmaking can be a long process. An international code of conduct for outer space could be quite long in the making, because states' interests in such a code would be substantial. However, a visa scheme might be readily accepted by the states as it would allow them to extend their domestic laws over an easily identifiable class of persons in space. The protection of states' sovereign interests is paramount in setting up such a scheme. As seen with the Moon

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[161] *See* Swedish Act on Space Activities (SASA 1982:963). The Swedish code restricts Swedish Nationals from carrying on Space Activities from outside Sweden without a license, and the penalty is penal. The Swedish regime is closer to that suggested here than others, it however lacks any language extending its jurisdiction *en banc* over its licensees. *Id.*

[162] Bryan Paul Christian, *Visa Policy, Inspection, and Exit Controls: Transatlantic Perspectives on Migration Management,* 14 GEO. IMMIGR. L.J. 215 (1999-2000).

[163] OST, *supra* note 3, art. 6.

[164] Tennen, *supra* note 91, at 342-43.

[165] Robbins, *supra* note 113, at 653.

Treaty, states will shy away from treaties that they feel do not protect their interests.[166] The space visa would protect states' interests, because it would only be an addition to an already working and accepted international system. Because "each visa system must be viewed as a product of its distinct national configuration, and not as superior or inferior to another,"[167] states would each have the power to craft the space visa into the sort of document that it deems best protects it and those traveling under that regime.

The passport regime in the international arena helps to "facilitate people's movements."[168] It also does much more than this, though; it also "ensures that their bearers may avail themselves of the protections that state may provide."[169] The space visa would allow a traveler to avail himself to the protection of the issuing state. In exchange for this protection, the traveler submits to the "control function" of the modern passport.[170] The control element that states gain through the issuing of passports is exactly the element that preserves their sovereign interests in a space visa regime. Not only do they grant permission to enter the territory of space, but they are able to extend their control over individuals there. A state can, as with a terrestrial visa, choose whether it will grant it to a particular person or not. This determination is made under the domestic laws of that nation and is not a matter of international control. Persons have "increasingly come to be seen as lacking any *prima facia* claim to access to the territory of a state other than their own."[171] By the same reasoning it could be claimed that a person would lack any claim to accessing the territory of space. While it is considered the "province of all mankind,"[172] it is defined in such a manner by states in order to preserve state interests, and

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[166] STATUS, *supra* note 10.

[167] Christian, *supra* note 162, at 216.

[168] JOHN TORPEY, *The Great War and the Birth of the Modern Passport System*, *in* DOCUMENTING INDIVIDUAL IDENTITY: THE DEVELOPMENT OF STATE PRACTICES IN THE MODERN WORLD 257 (Princeton University Press 2001).

[169] *Id.*

[170] *Id.*

[171] *Id.* at 269.

[172] OST, *supra* note 3, at art. 1.

not to preserve individual citizen's specific claims to access.[173] It would seem counter productive for a state to massively restrict its citizens' access outer space, but many states do severely restrict the rights of their citizens to leave the states' territories, and "[p]assports are the primary document that states use to regulate the permeability of their borders."[174] Also, due to state responsibility for non-governmental actors imposed by the space treaties, states would have definite interests in restricting, for example, convicted felons from entry into outer space. Since "[m]ovement is strictly determined as legitimate or illegitimate at the will of the sovereign state," then it can only be concluded that this includes movement into international territories such as space.[175] "Subjects of a state cannot automatically assume that they have the right to travel abroad, a situation both manifested and exacerbated by the fact that most states now require passports for departure from their domains."[176] However, a passport is not the only requirement for some countries. Many nations "insist that the international voyager acquire an exit visa as evidence of the state's acquiescence in the traveler's . . . departure."[177] The space visa would also function as an exit visa in which the state would acquiesce to the traveler's departure in return for the traveler's acquiescence to the states jurisdiction over his or her acts while in the territory of space.

Passports serve to "connect the individual to the realm of the international."[178] It is this connection that makes the passport (and visa's placed therein) the natural vehicle for initial jurisdictional controls in outer space in lieu of territorial jurisdiction. A space visa would further the notion that the passport "connects the individual to international law through the sovereign state."[179] It has been argued that jurisdiction is the "distri-

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[173] *See id.* at art. 6.

[174] SALTER, *supra* note 47, at 2.

[175] *Id.* at 7.

[176] John Torpey, *Coming and Going: On the State Monopolization of the 'Legitimate Means of Movement*, SOC. THEORY, at 239, 251 (Nov. 1998).

[177] *Id.* It should be noted that Torpey sees this as a state monopolization over its citizens' movements, and he views it in less than favorable light. *Id.*

[178] SALTER, *supra* note 47, at 1.

[179] *Id.* at 4.

bution of *authority* (as distinguished from power) among different legal institutions and separate political entities."[180] If states were to use space visas authority to prosecute and oversee would be distributed amongst the states. This is particularly important in the arena of space where the spacial boundaries that usually demarcate these distributions are absent. Additionally, by making this distribution horizontally among the states it is likely that a "more rational delimitation of jurisdiction will result" than by attempting to "centralize authority."[181]

Also, this arrangement would allow passengers to enter outer space with a reasonable certainty of the law that could be exerted over them and actually allows that person to submit to that code. When a citizen enters the territory of a different state he or she must "relinquish the rights that her home country grants when she petitions" to enter the foreign state.[182] In essence this traveler has "subjugated those rights to the sovereign whose territory she is entering."[183] Space lacks territorial control except in the case of properly registered space objects. A space visa would allow the traveler to subjugate her rights to a sovereign on a personal jurisdiction level, because a visa can come with "attendant benefits" which could include the benefits of jurisdiction.[184] The result is that the state has extended its control over a person in outer space without violating the OST's ban on claims of jurisdiction over regions of space, and the individual involved has voluntarily submitted to the personal jurisdiction of the state granting the visa.

It should be noted that the space visa system would not eclipse customary international law rules or treaty rules, instead it allows a state to have primary jurisdiction. In the same way Article 8 of the OST does not create "exclusive" jurisdic-

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[180] RICHARD A. FALK, THE ROLE OF DOMESTIC COURTS IN THE INTERNATIONAL LEGAL ORDER 21 (Syracuse University Press 1964).

[181] *Id.* at 22. Horizontal order, according to Falk, is like that among the states and is non-hierarchical. Vertical order on the hand is like that between a federal government and the states below it, which is hierarchical. *Id*.

[182] SALTER, *supra* note 47, at 128.

[183] *Id.*

[184] Christian, *supra* note 162, at 215.

tion[185] over a space object, a space visa would not create exclusive jurisdiction in the issuer.[186] Other states with an interest could exert jurisdiction under customary or treaty law as they would be able to on earth.

Additionally, this system would allow for flexibility. As space law progresses this is a system that would allow for the easy implementation of an international space code of conduct that could then be applied uniformly to all bearers of space visas (and even include penalties for those who fail to obtain such a visa). Other systems might prematurely limit legal growth in outer space, which could be potentially bad due to the fact that the unknowns of outer space could make for situations that a rigid international treaty would be unable to adapt to due to the slow process of producing international law. This flexibility is desirable, because in the future it could be expected that there will be space colonies, at which point some new way of documentation and legislation will be needed. Instead of being bogged down by an international treaty, the international community will be able to react in an efficient way to ensure that the rule of law continues in space and that there is some sort of body that can exert jurisdiction over malefactors.

Ideally the implementation of such a regime would be a simple treaty, but it could be initiated through a Generally Assembly resolution with sufficient backing. A standard form could be adopted through the ICAO, as has been done with the Machine Readable Passport.[187] It would then be up to individual states to create the domestic legislation that best suits their own needs in the execution of its treaty obligations.

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[185] *See* Gorove, *supra* note 93, at 316-17 ("if the state of registry for some reason did not prosecute, this fact alone should not necessarily bar prosecution by another state on the basis of invoking some other recognized principle of criminal jurisdiction.").

[186] For example, Finland would still be able to assert its criminal code on its own nationals regardless of what country's visa the national were to hold.

[187] MRTD - Machine Readable Travel Documents, http://mrtd.icao.int (last viewed June 19, 2006). The ICAO currently adopts the specifications for the internationally interpretable passport.

VII. CONCLUSION

While a space visa might not solve every jurisdictional problem that could occur in outer space, it could certainly help clarify the subject. The realm of outer space is an uncertain area; however, exploration of it will be fostered by certainty of the law that applies. A space visa helps to cure this ill, by providing a primary body of law that the holder can depend on - not only to punish him, but also to protect him. Additionally, the space visa would lend more certainty to civil law jurisdiction by creating a situation where there is at least one definite forum with a connection to a space defendant. Finally, the space visa would create a uniform, yet flexible, state of law, able adapt itself to the ever changing situations in outer space that comes with mankind's increasing presence there. Law has preceded the nations into space. It is now time for it to (as Andrew Haley declared) precede man into space.

PATENT RIGHTS UNDER SPACE ACT AGREEMENTS AND PROCUREMENT CONTRACTS: A COMPARISON BY THE EXAMINATION OF *NASA'S COMMERCIAL ORBITAL TRANSPORTATION SERVICES (COTS)*

Tiphany Baker Dickerson[*]

I. INTRODUCTION

Although the National Aeronautics and Space Administration ("NASA") has exclusively conducted missions to space for the last forty years on behalf of the United States, the landscape of space exploration has evolved, and is now on the brink of a revolution. Congress passed the National Aeronautics and Space Act of 1958[1] (Space Act), which established and granted powers to the agency allowing a $100 million budget to carry out its mission.[2] Taking the lead in securing victory in the "space race" to the Moon was the agency's first mission.[3] Just over twenty years later, Congress modified the role of the multi-billion budget agency to reflect the United States' new priority of commercializing space[4] in pursuit of NASA's "private space race."[5] President Reagan had signed the Memorandum on Government Patent Policy, which proposed, "the head of each Ex-

[*] J.D. Candidate, December 2008, University of Mississippi School of Law; B.S. 2005, Mississippi State University.

[1] National Aeronautics and Space Act of 1958, 42 U.S.C. §§ 2451-2484 (2000).

[2] Roger Launius, Colin Fries & Abe Gibson, *A Selective Chronology of Defining Events in NASA History,* http://history.nasa.gov/Defining-chron.htm (last visited Nov. 15, 2007).

[3] *Id*.

[4] *See* National Aeronautics and Space Administration Authorization Act of 1985, §110, 42 U.S.C. § 2451 (2000) (amendment stating NASA's new purpose of 1985: "The general welfare of the United States of America requires that [NASA] . . . seek and encourage, to the maximum extent possible, the fullest commercial use of space.").

[5] Alan Boyle, *Finalists picked in NASA's private space race*, MSNBC.COM, May 10, 2006, http://www.msnbc.msn.com/id/12706352/.

ecutive Department and agency . . . shall promote commercialization…by granting to all contractors, regardless of size, the title to patents made in whole or in part with Federal funds, in exchange for royalty-free use by or on behalf of the Government."[6] This approach to innovation had a remarkable impact on the space industry.[7] More recently in January 2004, President Bush announced the United States' returned focus to promoting commercial participation in space exploration.[8] In the Vision of Space Exploration,[9] the new executive space policy, the President instructed NASA to pursue commercial opportunities for providing transportation support to the International Space Station ("ISS") and for exploration beyond low earth orbit missions.[10] Allowing private companies autonomy to produce their own vehicles and conduct launches leads to greater efficiencies, and NASA can alleviate its resources to return to the Moon and eventually journey to Mars and beyond.[11]

The agency implemented a new program in 2006 that specifically addresses the President's directives.[12] The Commercial Orbital Transportation Services ("COTS") program serves to stimulate commercial enterprise for transportation services to and from the ISS.[13] The agency hopes to foster a surge in the space market by investing seed money in the launch vehicle industry.[14] COTS is a demonstration competition. This means

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[6] Exec. Order 12,591, 3 C.F.R. § 220 (1987).

[7] Sylvia Katharine Kraemer, *NASA, Monopolies, and the Cold War: The Origins and Consequences of NASA Patent Policy, 1958-1996*, Presentation at the Annual Meeting of the Society for the History of Technology, (October 1999), *available at* http://www.hq.nasa.gov/office/codez/plans/R&D/SHOTOCT99.html.

[8] Press Release, White House, President Bush Announces New Vision for Space Exploration Program (Jan. 14, 2004), *available at* http://www.whitehouse.gov/news/releases/2004/01/20040114-3.html.

[9] Exec. Order No. 13,326, 3 C.F.R. § 13326 (2004); PRESIDENT'S COMMISSION ON IMPLEMENTATION OF UNITED STATES SPACE EXPLORATION POLICY, REPORT: A JOURNEY TO INSPIRE, INNOVATE AND DISCOVER (June 2004), *available at* http://www.nasa.gov/pdf/60736main_M2M_report_small.pdf.

[10] *Id*.

[11] NASA Authorization Act of 2005, at § 101, 42 USC § 16611 (2007).

[12] Press Release, NASA 06-029, NASA Seeks Proposals for Crew and Cargo Transportation to Orbit (Jan. 19, 2006), *available at* http:www.nasa.gov/home/hqnews/2006/jan/HQ_06029_Crew_Cargo_RFP.html..

[13] *Id*.

[14] *Id*.

NASA solicits proposals from companies in the space industry, and then selects winners by the quality of their proposals.[15] Under COTS, NASA budgeted in total approximately $500 million for years 2006-2010 to be allotted to the two winners who could demonstrate the ability to provide reliable, cost-effective transportation services in LEO missions.[16]

Traditionally, NASA has operated by employing private companies as independent contractors in addition to producing its own resources, but generally, NASA has always conducted its own missions to space.[17] Those contracting with NASA must abide by the Federal Acquisition Regulations (FAR), which regulates government procurement contracts.[18] NASA faces a problem common among governmental agencies in high-tech industries: private companies are reluctant to deal with the government because they desire to protect their intellectual property and because the FAR system is notoriously complex.[19] This problem is at odds with current United States policy, which calls for business relationships between government and commercial entities.[20] COTS solves this problem by using special contracting instruments that are more flexible than procurement contracts.[21] NASA expects that COTS will facilitate a smooth transition into commercialization for both NASA and private companies.[22] Part I begins by briefly introducing procurements system and examining the statutory and regulatory authority governing patents under the procurement contracts system. The second section of Part I will describe COTS in detail including the structure and source of authority for implementing such a program. Part II will discuss the impact of cer-

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[15] Valin Thorn, *Commercial Crew & Cargo Program Overview,* Presentation at the AIAA Aerospace Sciences Meeting, at 5 (Jan. 11, 2007), *available at* http://www.nasa.gov/pdf/168735main_AIAA_2007_COTS.pdf.

[16] *Id*.

[17] Press Release, NASA 06-029, *supra* note 12.

[18] Federal Acquisitions Regulations, 48 C.F.R. §§ 1-52 (2007).

[19] Nancy O. Dix et al., *Fear and Loathing of Federal Contracting: Are Commercial Companies Really Afraid to do Business with the Federal Government? Should They Be?*, 33 PUB. CONT. L.J. 5, 8 (2003).

[20] *Id*.

[21] Valin Thorn, *supra* note 15, at 5.

[22] *Id*.

tain statutes and regulations have on the patent rights of private companies, first under the traditional procurement system and then under the COTS program. Part III will compare the actual similarities and differences between the new and old approach.

A. Traditional Government Contracts System

Section 203(c)(5) of the Space Act authorizes NASA "to enter into and perform such contracts, leases, cooperative agreements, or other transactions as may be necessary in the conduct of its work and on such terms as it may deem appropriate…"[23] This provision expressly grants to NASA the right to contract as necessary.

Traditionally government purchases of property and services occur under procurement contracts.[24] FAR mandates uniform procedures and policies for all government procurements.[25] NASA is one of the few agencies that publishes its own supplement to the general regulations.[26] The NASA FAR Supplement ("NFS") regulates all procedures and policies relating to NASA's procurements including the allocation of patent rights, data rights, and copyright protection borne out of contracts.[27] NFS serves to supplement rather than supplant the FAR, so companies must familiarize themselves with both regulatory systems to ensure complicity with the rules.[28] NASA defines a procurement contract as "a mutually binding legal relationship obligating the seller to furnish supplies or services (including construction), and the buyer pays for them."[29] According to NASA, the principal purpose for entering into procurement contracts is "to produce something for NASA's own use."[30]

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[23] 42 U.S.C. § 2473(c)(5) (2007).

[24] 31 U.S.C. § 6303 (2007).

[25] GEORGE V. D'ANGELO, AEROSPACE BUSINESS LAW 10-11 (1994).

[26] *Id*. 48 C.F.R Chapter 18.

[27] Federal Acquisition Regulations for National Aeronautics and Space Administration, 48 C.F.R. §§ 1800-1899 (2006).

[28] *Id*. "The provisions of FAR Part 27 apply to NASA acquisitions unless specifically excepted in this part." *Id.* § 1827.00.

[29] 14 C.F.R. § 1260.12(b)(1) (2007).

[30] *Id*. § 1260.12(f)(1).

B. COTS System

As with procurement contracts, NASA's source of authority for the COTS program is Section 203(c)(5) of the Space Act.[31] However, under COTS, NASA will use two different types of contractual instruments: Space Act Agreements ("SAA") and procurement contracts.[32] Understanding the structure of COTS aids in understanding how NASA implemented the use of both instruments.

NASA established the Commercial Crew/Cargo ("CCC") Project Office to implement the new commercialization policy.[33] CCC's mission is to collaborate with industry for demonstration of space transportation capabilities and produce launch services to re-supply the ISS.[34] The two-phased structure of the program's acquisition strategy reflects this mission.[35] NASA indicates that purpose of Phase 1 (demonstration phase) is to invest in demonstrations of commercial orbital transportation services to the ISS, while the Phase-2 purpose is to purchase commercial services for ISS logistics support.[36]

Phase 1 consists of scheduled demonstrations to show each company's ability to execute capability milestones set forth by NASA.[37] During Phase 1, which began in August 2006, NASA received proposals from private companies in the space vehicle industry.[38] Proposals needed to indicate the company's ability to execute the following general capabilities:

a. external cargo delivery and disposal;

b. internal cargo delivery and disposal;

c. internal cargo delivery and return;

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[31] 42 U.S.C. § 2473(c)(5) (2007).

[32] Valin Thorn, *supra* note 15, at 5.

[33] *Id*. at 4.

[34] *Id*.

[35] *Id*. at 5.

[36] Dennis Stone, *NASA's Commercial Crew & Cargo Program,* Presentation at FAA 10th Annual Commercial Space Transportation Conference, at 4 (Feb. 6, 2007), *available at* http://www.nesdis.noaa.gov/space/launch/c3po.ppt.

[37] *Id*. at 11.

[38] Press Release, NASA 06-029, *supra* note 12.

d. crew transportation.[39]

NASA reviewed twenty-one proposals, and after sifting those down to six finalists chose two COTS partners: Space Exploration Technologies Corporation (SpaceX) and Rocketplane-Kistler Limited Incorporated (RpK).[40] NASA entered into funded SAAs with these two companies for the performance of the general capabilities listed above; SpaceX won $278 million and RpK won $207 million.[41] NASA will pay the awards in increments as they complete each milestone and undergo site visits.[42] Capability D, crew transport, is an optional capability, which is accessible only after successful demonstration of Capability C.[43]

Other companies who did not receive funded SAAs may sign reimbursable or nonreimbursable SAAs instead. In January 2007, NASA entered into nonreimbursable SAAs with PlanetSpace, Inc. and Transformation Space Corp. (t/Space).[44]

Under Phase 2, NASA will competitively procure orbital transportation services from partners that successfully demonstrate any mission capability under Phase 1.[45] NASA will purchase transportation services under Phase 2 as early as 2010. If a partner demonstrates Capability D, then Phase 2 in crew transport will begin in 2011.[46] The agency will conduct Phase 2 of COTS using procurement contracts governed by the FAR Part 12, Commercial Items.[47] Part 12 lists standards of commercial practice including a listing of appropriate terms and conditions

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[39] Valin Thorn, *supra* note 15, at 3.

[40] *Id*. at 8.

[41] Press Release, NASA 06-029, *supra* note 12.

[42] Press Release, NASA 07-46, NASA Commercial Space Partners Complete Milestones (Feb. 16, 2007), *available at* http://www.nasa.gov/home/hqnews/2007/feb/HQ_0746_COTS_milestones.html.

[43] *Id*.

[44] Johnson Space Center, *Commercial Space Transportation Capabilities Agreements Signed*, http://technology.jsc.nasa.gov/commercial_space.cfm (last visited Nov. 27, 2007).

[45] Valin Thorn, *supra* note 15, at 5.

[46] *Id*. at 6.

[47] *Id*. at 25.

for government purchases of commercial items.[48] Part 12 drafters sought to balance the interests of both the buyers and sellers in commercial items transactions.[49] Having stimulated the market environment, NASA will competitively purchase launch services, choosing amongst all COTS partners and other competitors.[50] By 2015, NASA expects COTS to have cultivated an entire industry of commercial transportation space services.[51]

NASA plays a non-traditional role in COTS in light of traditional government contracting practices with commercial companies.[52] NASA will provide technical and business support to COTS partners at their requests.[53] The agency also plans to provide indirect support to the partners by "educating the investment community about COTS and by helping to stimulate [non-ISS related] markets for the COTS industry."[54] This non-traditional role creates synergistic benefits for both parties: the relationship removes uncertainty by providing the financial resources to technically capable commercial partners and freeing NASA's resources to focus on other projects.[55]

Space Act Agreements are legally enforceable promises between NASA and the other party to the agreement.[56] Section 203(c)(5), the provision in the Space Act that authorizes procurement contracts also authorizes SAAs, but instead, the agency uses authority from the "and other transactions" clause.[57] Other transactions authority ("OTA") is congressionally endorsed authority to make agreements that selected agencies use for contracting flexibility and for escaping the regula-

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[48] Carl Vacketta and Susan Hope, *Commercial Item Contracts: When is a Government Contract Term or Condition Consistent with "Standard" or "Customary" Commercial Practice?*, 27 PUB. CONT. L.J. 291, 295 (1998).

[49] *Id*. at 298.

[50] *Id*.

[51] *Id*.

[52] Dennis Stone, *supra* note 36, at 12.

[53] *Id*.

[54] *Id*.

[55] *Id*.

[56] NASA, OFFICE OF GENERAL COUNSEL, NASA POLICY DIRECTIVE 1050.1H: AUTHORITY TO ENTER INTO SPACE ACT AGREEMENTS 1 (November 29, 2006), *available at* http://nodis3.gsfc.nasa.gov/npg_img/N_PD_1050_001H_/N_PD_1050_001H__main.pdf.

[57] *Id*., *see* 42 U.S.C. § 2473(c)(5) (2007).

tory boundaries of the FAR.[58] The agency's interpretation of OTA is broader than any other arrangements listed in the provision because it confers broad discretion in negotiating the contract terms.[59] The authority allows NASA a commercial-like freedom to tailor each agreement to the specific needs of the partner and the mission.[60] This characteristic affects potential intellectual property rights borne out of the agreement, in that they are not subject to the rules that govern contracts, grants, or cooperative agreements.[61]

The Department of Defense ("DoD") also uses other transactions authority.[62] Initially, the DoD's authority applied to research projects only, but five years later, Congress extended the authority throughout the agency.[63] While NASA has had other transactions authority for twice as long as the DoD, which began using the authority in 1989, the DoD has extensively developed its use of the authority.[64]

II. PATENT RIGHTS

Having reviewed the basic functions of procurement contracts and SAAs, this section will examine the effect that the nature of the instrument has on the assignment of patent title and patent waivers. Both statutory and regulatory authorities require that procurement contracts and SAAs contain patent rights clauses.[65] This section will examine how the Space Act requirements affect procurement contracts and SAAs. The Space Act essentially requires that NASA take title of certain patents—that invention titles resulting from certain procurement contracts are "vested" in the agency.[66] However, in prac-

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[58] NASA POLICY DIRECTIVE , *supra* note 56, at 1.

[59] *Id*.

[60] *Id*.

[61] *Id*.

[62] 10 U.S.C. § 2371(a) (2007).

[63] David S. Bloch and James G. McEwen, *Other Transactions with Uncle Sam: A Solution to the High-Tech Government Contracting Crisis*, 10 TEX. INTELL. PROP. L. J. 195, 210 ((2002).

[64] Defense Authorization Act for FY 1990 and 1991, H.R. Rep. No. 2461 (1989).

[65] 14 C.F.R. § 1274.208(b) (2007).

[66] 42 U.S.C. § 2457(a) (2007).

tice, NASA liberally waives its patents rights over to contractors under the waiver provision of Section 305.[67]

At the announcement of COTS, partners expressed enthusiasm over the innovative use of SAAs perhaps because they associate the use of SAAs with flexibility and freedom to negotiate the allocation of intellectual property rights. However, the answer as to whether private companies will ultimately fair better under SAAs than under procurement contracts is still elusive. This section seeks to answer the elusive question by comparing the oldest form of government-commercial relationship which is procurement contracting to this new scheme.

A. Presumptive Rights Provisions

Section 305(a) of the Space Act governs the allocation property rights in inventions for all who work with NASA.[68] In particular, the section describes the scenarios in which NASA has a vested interest in the patents arising out of the contract. The applicability of Section 305(a) of the Space Act rests on whether partner performs work of an inventive type for NASA.[69] Section 305(a) provides:

> (a) Whenever any invention is made in the performance of any work under any contract of the Administration, and the Administrator determines that--
>
> (1) the person who made the invention was employed or assigned to perform research, development, or exploration work and the invention is related to the work he was employed or assigned to perform, or that it was within the scope of his employment duties, whether or not it was made during working hours, or with a contribution by the Government of the use of Government facilities, equipment, materials, allocated funds, information proprietary to the Government, or services of Government employees during working hours; or

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[67] *Id*. § 2457(c).
[68] *Id*. § 2457(a).
[69] *Id*.

> (2) the person who made the invention was not employed or assigned to perform research, development, or exploration work, but the invention is nevertheless related to the contract, or to the work or duties he was employed or assigned to perform, and was made during working hours, or with a contribution from the Government of the sort referred to in clause (1), such invention shall be the exclusive property of the United States, and if such invention is patentable a patent therefore shall be issued to the United States upon application made by the Administrator, unless the Administrator waives all or any part of the rights of the United States to such invention in conformity with the provisions of subsection (f) of this section.[70]

1. Procurement Contracts

Section 305(a) expressly states applicability to procurement contracts.[71] Accordingly, ownership of the patents vests in the agency once they determine whether Section 305(a)(1) or 305(a)(2) applies to the contractor.[72] This inquiry ultimately depends on whether the contractor was doing work of an "inventive type" for NASA.[73] Interpreting this provision also requires inquiries into when the inventor conceived the invention or reduced the invention to practice.[74] In the following case, an inventor attempted to retain title in a patent due to a belief that it was reduced to practice after the contract term was over.

In *Hummer v. NASA*, Robert Hummer initially challenged a decision by the Board of Patent Appeals and Interferences ("BPAI"), which decided that an application initially filed by Hummer should instead issue to NASA based on a Section 305(a) interpretation.[75] The invention in dispute involved a "'spin scan' camera arrangement" that was used to photograph

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[70] *Id*.

[71] *Id*.

[72] NASA, OFFICE OF GEN. COUNSEL, NASA ADVISORY IMPLEMENTING INSTRUCTION: SPACE ACT AGREEMENT GUIDE § 2.2.10.3 (December 15, 2006), *available at* http://nodis3.gsfc.nasa.gov/NPD_attachments/NAII_1050_1.doc.

[73] *Id.* at n. 28.

[74] RALPH C. NASH, JR. & LEONARD RAWICZ, INTELLECTUAL PROPERTY IN GOVERNMENT CONTRACTS 275 (5th ed. 2001).

[75] Hummer v. NASA, 500 F.2d 1383 (C.C.P.A. 1974).

cloud formations from a satellite stationed in a synchronous orbit.[76]

The BPAI found that the contractors first reduced the invention to practice on December 6, 1966.[77] This occurred when the satellite, ATS-1 successfully created photographs of cloud formations from the signals the satellite sent to Earth.[78] Although Hummer had worked on the satellite prior to the contract term, the BPAI held that Hummer's pre-contract work did not amount to reduction to practice "since the camera had been built at Santa Barbara Research Center [under] … a contract between NASA and the University of Wisconsin, and installed in the ATS-1 satellite under provisions of a contract between Hughes Aircraft and NASA."[79]

On appeal, Hummer argued that the prototype arrangement used met all the limitations of the patent claims, and this qualified as reduction to practice.[80] The first element of the first claim in the patent went as follows:

> In a radiation sensing camera arrangement adapted for use in a rotating body to scan a terrestrial area and wherein the body is in relatively stationary relation to the scan area, the combination of the camera adapted for carriage by the body and for rotation therewith ...[81]

Hummer's prototype simulated the invention by placing a rotating mirror around the mounted camera to replicate the directed effect.[82] The Court of Customs and Patent Appeals affirmed the BPAI holding that Hummer had not reduced the invention to practice since claim 1, line 1 of the patent involved a rotating body, and Hummer's prototype did not use a rotating body.[83] As a result, the reduction to practice date affected the

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[76] *Id*. at 1385.
[77] *Id*.
[78] *Id*.
[79] *Id*. at 1386.
[80] *Id*. at 1387.
[81] *Id*. at 1385.
[82] *Id*. at 1387.
[83] *Id*.

court's interpretation of Section 305(a).[84] The court reasoned that the event of a first actual reduction to practice while under NASA contract vested the right in the agency.[85]

2. SAAs

Since SAAs are not contracts, presumption of title provisions generally do not apply.[86] Nevertheless, some SAAs contain language that effectively activate § 305(a).[87] The type of relationship NASA has with a COTS partner will trigger a need for presumptive language. Such relationships exist when the partner is doing "work of an inventive type" for NASA; conversely, if the partner is not doing work for NASA, the SAA probably will not contain this language.[88].

The SAA provision that effective activates the section 305(a) language is appropriately labeled presumption of title.[89] The presumption of title provision in the SpaceX and RpK SAAs states, "Any invention made under this Agreement shall be presumed to have been made in the manner specified in paragraph (1) or (2) of section 305(a)…"[90] This provision of the contract gives the agency the right to the patent title just as it would under a procurement contract.[91]

The relationship that NASA intends to have with a potential partner determines which type of SAA the agency will offer.[92] The SAA Implementation Guide published by the agency outlines the inquiry to determine the appropriate characteriza-

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[84] *Id*. at 1388.

[85] *Id*.

[86] NASA ADVISORY IMPLEMENTING INSTRUCTION, *supra* note 72, § 2.2.10.3.

[87] *Id*.

[88] *Id*.

[89] Space Act Agreement Between NASA and Kistler Aerospace Corporation and Rocketplane Ltd. for COTS Art. 13(B)(1) (Aug. 18, 2006) (hereinafter Rocketplane SAA); Space Act Agreement Between NASA and Space Exploration Technologies Corp. for COTS, at art. 13(B)(1) (Aug. 18 2006) (hereinafter SpaceX SAA). Both documents available in one PDF at http://www.nasa.gov/centers/johnson/pdf/162330main_SPACE_ACT_AGREEMENT_FOR_COTS.pdf.

[90] SpaceX SAA, *supra* note 89, at art. 13(B)(1)(a); Kistler SAA, *supra* note 89, at art. 13(B)(1)(a).

[91] Kistler SAA, *supra* note 89, at art. 13(B)(2); SpaceX SAA, *supra* not 89, at art. 13(B)(2).

[92] NASA ADVISORY IMPLEMENTING INSTRUCTION, *supra* note 72, § 2.2.10.3.

tion of the relationship. These factors determine whether a partner is performing work for NASA, or for its own private use: whether there is reimbursement for the work, whether the work involved R&D, and whether NASA has imposed mission requirements on the partner.[93]

Using this approach, NASA balances the government and private interests involved to determine whether to offer reimbursable, nonreimbursable, or funded agreements.[94] Reimbursable and nonreimbursable agreements are most favorable for the private company seeking to retain maximum intellectual property rights. Under reimbursable SAAs, the partner reimburses NASA either fully or in part for any aid received.[95] On the contrary, under reimbursable agreements, the parties exchange no funds; each party bears its own costs of participation.[96] NASA appropriates funds to recipients of funded agreements to accomplish an agency mission.[97] The Implementation Guide limits the use of funded agreements to situations of last resort—when the mission "cannot be accomplished by the use of a contract, grant, or cooperative agreement or a reimbursable or non-reimbursable SAA."[98]

The Implementation Guide also requires that SAAs include intellectual property provisions.[99] Generally, the SAA will divide intellectual property into two articles: those governing invention rights and a separate article governing data rights. Because of the flexibility of the SAAs, the articles may vary. The Implementation Guide specifies the following five factors in determining the intellectual property provisions of a SAA:

1) the purpose of the SAA;

2) whether the SAA is reimbursable or nonreimbursable;

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[93] *Id*.
[94] *Id*.
[95] *Id*. § 1.5.
[96] *Id*. § 1.4.
[97] *Id*. § 1.7.
[98] *Id*.
[99] *Id*. § 2.2.10.

> 3) whether NASA's or the partner's responsibilities involve inventive or creative activities;
>
> 4) whether the partner is performing work for NASA; and
>
> 5) whether there is any likelihood that third party proprietary data or Sensitive But Unclassified (SBU) government data will be exchanged under the SAA[100].

Excluding COTS winners SpaceX and RpK agreements, most SAAs do not involve partners doing work of an inventive nature for NASA. Instead, most SAAs could be described as symbiotic; both entities benefit from the relationship. Some relationships, like those with PlanetSpace and t/Space (COTS partners), are solely guidance-based.[101] The Patent Rights sections of each of their nonreimbursable SAAs included the following provision: "NASA has made an administrative determination that the provisions of section 305(a) of the National Aeronautics and Space Act of 1958, as amended (42 U.S.C. § 2457(a)), do not apply to this Agreement."[102] Since the agreements signed by PlanetSpace and t/Space were nonreimbursable, those companies retain title to all patents resulting from this agreement.[103]

B. Waivers & Licenses

Although the Space Act provides that all patents vested in the agency as described by the presumption of title provisions will issue in the name of NASA's Administrator[104] private companies still have an opportunity to request that NASA waive

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[100] *Id*.

[101] Johnson Space Center, *supra* note 44.

[102] Nonreimbursable Space Act Agreement Between NASA and Planetspace, Inc. for COTS, at Art. 11 (Jan. 31, 2007), *available at* http://www.nasa.gov/centers/johnson/pdf/173096main_Planetspace_SAA.pdf (hereinafter Planetspace SAA); *see also* Nonreimbursable Space Act Agreement Between NASA and Transformational Space Corp. for COTS, at art. 11 (Jan. 31, 2007), *available at* http://www.nasa.gov/centers/johnson/pdf/173097main_tSpace_SAA.pdf (hereinafter Transformational Space SAA).

[103] Transformational Space SAA, *supra* note 102; Planetspace SAA, *supra* note 102.

[104] 42 U.S.C. § 2457(c) (2007).

title.[105] In an effort to comport with the country's intellectual property and commercialization policies, NASA liberally grants waivers to companies.[106]

1. Procurement Contracts

Since Section 305(a) is generally applicable to procurement contractors, the waiver policy flows to those contractors doing work of an inventive type for NASA.[107] Section 305(f) provides that companies requesting wavier must file a certified written statement to the Inventions and Contributions Board explaining 1) the circumstances around the conception and reduction of practice of the patent; and 2) relationship of the invention to the performance of work under contract.[108] A contractor may apply for advanced waiver or waiver after the patent issuance.[109] If the NASA Administrator objects to the issuance of title to the contractor, then the Board of Patent Appeals Interferences will administer an "entitlement proceeding" to determine ownership of patent title.[110]

Section 305(f) of the Space Act empowers NASA to waive any of its rights to invention.[111] However, NASA is statutorily bound to reserve a minimum right even in the patent titles waived.[112] The "reservation clause" of Section 305(f) establishes, "[e]ach such waiver made with respect to any invention shall be subject to the reservation by the Administrator of an irrevocable, nonexclusive, nontransferable, royalty-free license for the

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[105] 42 U.S.C. § 2457(f) (2007).

[106] NASA ADVISORY COUNCIL, 2006 MEETING REPORT 5 (Feb. 8-9, 2006) (on file with author).

[107] 42 U.S.C. § 2457(f) (2007).

[108] *Id*.

[109] 14 C.F.R. §§ 1245.104-105 (2007).

[110] "One fundamental difference between an interference and an entitlement proceeding is that an interference involves the question of which of two (or more) inventorship entities will receive a patent on the involved subject matter, whereas in an entitlement proceeding only one inventorship entity is involved and there is no question that any patent to be issue will be issued to that entity…." JOHN GLADSTONE MILLS III ET AL., PATENT LAW FUNDAMENTALS § 18:11 (2nd ed. 2007).

[111] 42 U.S.C. 2457(f) (2007).

[112] *Id*.

practice of such invention throughout the world."[113] In order to apply for a waiver, companies must first submit a proposal to the Inventions and Contribution Board of NASA, and then appear in a hearing before the Board, which in turn develops findings of fact.[114]

In addition to the waiver provisions provided in the Space Act, the Patent Act contains provisions that have the effect of waiver of patent title by the agency; those provisions collectively form the Bayh-Dole Act.[115] By enacting these provisions, Congress intended to use the patent system to promote the utilization of inventions arising from federally supported research and development as required.[116] Congress addressed these intentions by providing small businesses and non-profit organizations with the option to elect to retain title to inventions made when working with federal agencies.[117] Agencies like NASA implemented Congress' intent by granting to contractors the title to patents made partially or solely with federal funds.[118] With this assurance of patent rights, non-profits such as universities enter into research and development agreements with federal agencies cognizant of their freedom to build their patent portfolios aggressively.[119]

Since the Space Act expressly mentions contracts, the provisions unquestionably apply to NASA procurement contracts.[120] So, universities, small businesses, and other non-profit institutions enjoy an exemption when working from NASA under procurement contracts, thereby reversing the presumption of title in Section 305(a).[121]

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[113] *Id*.

[114] 14 C.F.R. §§ 1245.104 -105 (2007).

[115] Bayh-Dole Act, 35 U.S.C. §§ 200 – 212 (2007).

[116] Exec. Order No. 12,591, *supra* note 6.

[117] 35 U.S.C. § 202 (2007).

[118] 48 C.F.R. § 27.302 (2007).

[119] This is despite the ability of agencies to recapture title by requiring periodic reports inquiring how the contractor is utilizing its patent rights under the March-In Rights provisions in Section 203 of the Act. Dix, *supra* note 19, at 10.

[120] *Id*.

[121] *Id*.

2. SAAs

NASA's decision to waive patent title ultimately depends on its contributions to the project, whether financially or through other support.[122] If the partner has a funded agreement, then the waiver provisions usually mirror the waiver provisions in procurement contracts.[123] On the other hand, with respect to nonreimbursable agreements, waivers are usually a non-issue because companies completely retain title.[124]

In respect to the Bayh-Dole Act, because funding agreements (not to be confused with funded SAAs) include contracts, grants, and cooperative agreements, the Bayh-Dole provisions do not reach the agreements established under OTA; thus, the Act does not govern any type of SAA.[125]

III. RESULTS AND PROPOSED CHANGES

A close examination of both procurement contracts and COTS reveals that the patent rights borne out of COTS agreements show few differences from to those resulting from procurement contracts. SpaceX and RpK signed funded SAAs which include exactly the same patent rights provisions as those under traditional procurement contracts. The most significant difference between funded SAAs and traditional procurement contracts is the availability of monetary assistance and that the burden of complying with the FAR is lifted. With regards to patent rights, nonreimbursable SAAs carry with them, the greatest potential for retaining patent title as well as any other intellectual property rights. While funded SAA partners are least likely to retain exclusive patent rights, their other advantages mitigate this drawback.

Despite the type of SAA partners sign, they receive the benefit of working with the government, which is desirable when free from the complexity of the FAR system. The use of SAAs puts NASA on almost equal footing with private compa-

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[122] NASA ADVISORY IMPLEMENTING INSTRUCTION, *supra* note 72, § 2.2.10.3.

[123] *Id.*

[124] *Id.*

[125] *Id.* § 2.2.10.3, at n. 28.

nies in terms of having flexibility to negotiate the terms of the agreement. The value created from allowing companies to circumvent the FAR system compensates for other deficiencies for now, but the agency should continue to look for creative ways to attract more private entities. Since the DoD has extensively used its other transactions authority, the answer may be in adopting their more of their practices.

SpaceX, the COTS partner that received the lion's share of the award, generally eschews traditional government research and development contracts, preferring to fund its own research and therefore own its own intellectual property. Moreover, except as required by contract or agreement, the company does not seek patent protections for many of its inventions. [126] Wary of encountering *Hummer*-like battles over patent title and encroachment by foreign entities on published U.S. patents, SpaceX generally opts for trade secret protections. While the practicalities of this approach may better suit companies like SpaceX, this outcome puts the public at a disadvantage because the public does not receive the benefit the disclosure of the invention.

Nevertheless, COTS is a move in the right direction, but NASA still has to offer more options to give companies security to contract without concern of losing intellectual property. Given the high-tech nature of the companies entering into SAAs, the potential for maximum protection of intellectual property rights is critical for both the partners and the government. If the government fails to provide sufficient options for companies to retain intellectual property rights, those companies might revert to entering mainly private ventures or like SpaceX, choose not to seek patent protection at all— in either case, the result is a failure in light the goal of commercialization.

[126] Tim Hughes, SpaceX Chief Counsel, Presentation at Univ. of Miss. School of Law (April 17, 2005).

SPACE TOURISM ACTIVITIES – EMERGING CHALLENGES TO AIR AND SPACE LAW?

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ABSTRACT

Early market forecasts of the space tourism industry place its worth at more than USD $1 billion by 2021. Many companies, alert to the vast economic potential of space tourism, have made ambitious plans for commercial orbital and sub-orbital flights, the earliest of which are scheduled for launch in 2009. This is in addition to the already well-known flights of certain individuals aboard the International Space Station (ISS). These breathtaking events in space economics throw the gauntlet at the feet of international space law. Emerging challenges include the issues of the applicability of air law and space law, registration and jurisdiction, authorisation, and liability. Solutions to these issues must be developed in order for air and space law to remain relevant in this evolving nexus.

I. INTRODUCTION

Space tourism and its prospects received yet another nod of approbation in June 2007 when EADS Astrium, a wholly owned subsidiary of the European aerospace and defense giant EADS, announced its billion-Euro plans to muscle in on the market.[1] In the pipeline are plans to build a business jet-sized vehicle capable of carrying four passengers into outer space by 2012. As-

* Paper read at the International Conference on Air Transport and Space Activities at the China University of Political Science and Law in Beijing on 25 to 26 June 2007. Prof. Hobe is the Director of the Institute of Air and Space Law of the University of Cologne; Dr. Goh and Ms. Neumann are Senior Research Associates at the same Institute.

[1] EADS Astrium website, *Astrium rockets into space tourism*, ¶ 7 (June 13, 2007), http://www.astrium.eads.net/press-center/press-releases/astrium-rockets-into-space-tourism (last visited Dec. 9, 2007).

trium's plans make it the newest member of a circle of companies investing in commercial orbital and sub-orbital space tourism, the arguable frontrunner of which is Virgin Galactic.[2] Certainly, commercial orbital and sub-orbital space tourism includes a plethora of activities ranging from parabolic and sub-orbital flights that expose flight participants to short periods of micro-gravity, to longer-duration sojourns aboard orbital facilities such as the International Space Station (ISS). The ISS has thus far hosted five space tourists, each of whom paid an estimated USD $20 million apiece,[3] although recently more focus has returned to providing more affordable short-term suborbital flights to the general public.

At present two flight methodologies may be undertaken for these short-term suborbital flights: Aircraft launch or rocket-propelled launch. The former is based on SpaceShipOne,[4] a spacecraft that ignites its hybrid rocket engines upon release from a carrier airplane at a certain altitude. The released spacecraft then continues its suborbital flight, returning either to its point of departure or to a third location. The latter methodology involves a single-stage-to-orbit rocket launch with a capsule at its head. Upon attaining a certain altitude, the capsule separates from the rocket, exposing flight participants to a period of microgravity. The capsule returns to the Earth independently from its rocket.[5]

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[2] Virgin Galactic website,http://www.virgingalactic.com/ (last visited Dec. 9, 2007). The Company and its space tourism undertaking is profiled in KENNY KEMP, DESTINATION SPACE: HOW SPACE TOURISM IS MAKING SCIENCE FICTION A REALITY (Virgin Books 2007).

[3] The five space tourists at the time of writing are Dennis Tito, Mark Shuttleworth, Greg Olsen, Anousheh Ansari and Charles Simonyi.

[4] SpaceShipOne is the first private manned spacecraft exceeding an altitude of 328,000 feet (100 kilometers) twice in a 14-day period, winning the Ansari X-Prize of USD $10 million. Prototypes of its successor SpaceShipTwo will be completed by December 2007, with test flights beginning in 2008 with the ultimate goal of full safety certification from the Federal Aviation Administration (FAA) of the United States of America. SpaceShipTwo prototypes are intended for commercial use as part of Virgin Galactic's space tourism business plans. *See* Leonard David, *U.S. gives OK for SpaceShipTwo dealings*, MSNBC NEWS, (Aug. 15, 2005), http://www.msnbc.msn.com/id/8963138/ (last visited Dec. 8, 2007).

[5] Manned spaceflight technologies employing this methodology are the currently out-of-production Delta Clipper Experimental (DC-X), a reusable single-stage-to-orbit vehicle, *see The Delta Clipper Experimental: Flight Testing Archive* (Jan. 6, 1998),

The employment of both aircraft and spacecraft technologies in a commercial setting is the basis of this paper's two-fold inquiry. Due to the hybrid nature of the location in which these technologies are employed, the applicability of both air law and space law may come into play. Further, the interaction between States, private commercial entities and individuals engaged in such activities recall the traditional dichotomy between States and private actors, and its relevance in the novel field of space tourism.[6]

II. APPLICABILITY OF AIR LAW AND SPACE LAW

Air law and space law is often juxtaposed due to the proximity of these two regimes in their physical location. Interestingly these two regimes of international law are very far removed from each other. Air law emphasises State sovereignty and exclusive territorial jurisdiction, and is bolstered by the large corpus of international and national legislation typical of a well-established field of the law.[7] Conversely, space law highlights non-appropriation, jurisdiction on the basis of registration and launching, and State liability for damage caused.[8] It is also one of the youngest fields of international law, and correspondingly, one of the fields without a comprehensive legal framework. Thrown into the works is the very novel concept of space

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http://www.hq.nasa.gov/pao/History/x-33/dc-xa.htm (last visited Dec 8, 2007), and Blue Origin's New Shepard Reusable Launch Vehicle (RLV), which comprises a fully reusable propulsion module with a crew capsule on board, *see* Federal Aviation Administration Status Report, *Blue Origin West Texas Commercial Launch Site Environmental Assessment* (June 27, 2006), http://www.comspacewatch.com/news/viewsr.html?pid=21124 (last visited Dec. 7, 2007). These and other suborbital reusable launch vehicles are profiled in J.C. Martin & G.W. Law, *Suborbital Reusable Launch Vehicles and Applicable Markets* (October 2002), http://www.nesdis.noaa.gov/space/library/reports/2002-10-suborbital-LowRes.pdf (last visited Dec. 7, 2007).

[6] *See generally* Stephan Hobe, *Legal Aspects of Space Tourism*, 86 NEB. L. REV. (forthcoming 2007).

[7] *See generally* I.H.PH. DIEDERIKS-VERSCHOOR & M.A. BUTLER, INTRODUCTION TO AIR LAW (Kluwer Law International, 8th ed. 2006).

[8] *See generally* I.H.PH. DIEDERIKS-VERSCHOOR & M.A. BUTLER, INTRODUCTION TO SPACE LAW (Kluwer Law International, 2nd ed. 1999).

tourism,[9] an endeavour that just twenty years prior was considered to belong to the realm of science fiction. The challenge that arises in this context is the question: Which law applies?

In determining the applicability or otherwise of both air law and space law, two issues arise: the delimitation of air space and outer space, and the status of the vehicle in question.

A. Spatialism: The Delimitation between Air Space and Outer Space

The lack of a clear delimitation between air space and outer space has been loudly decried by many highly qualified publicists.[10] What appears to have been agreed upon is that the area below the altitude of 80 kilometres above sea level belongs in airspace, whilst that above 110 kilometres belongs in outer space. The area between these two altitudes however, remains controversial.[11]

In attempting to resolve this issue, two discursive methods have arisen. The "functionalist" approach regards a fixed altitude boundary to be irrelevant to the issue, concentrating instead on the criterion of the nature or purpose of a given activity in determining which legal regime should apply. The "spatialist" approach divides the applicable regime along the line of a strict altitude boundary. The polemic in the latter approach however, is that there has yet to be a verdict as to the exact location of this boundary.[12] While the majority view, including some State practice,[13] seems to be that outer space begins extends outwards

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[9] Stephen Hobe and Jürgen Cloppenburg, *Towards a New Aerospace Convention? – Selected Legal Issues of 'Space Tourism'*, 47 PROC. COLL. LAW OF OUTER SPACE 377 (2004).

[10] *See*, *inter alia*, Q.Z. He, *The Problem of Definition and Delimitation of Outer Space*, 10 J. SPACE L. 157 (1982); Bin Cheng, *Delimintation of Outer Space and Definition of Peaceful Use*, 11 J. SPACE L. 89 (1983).

[11] E. Vitt, *Grundbegriffe und Grundprinzipien des Weltraumrechts*, *in* 35 HANDBUCH DES WELTRAUMRECHTS, 43 et seq. (Böckstiegel, K.-H. et al. eds., Cologne 1991); Varlin J. Vissepó, *Legal Aspects of Reusable Launch Vehicles*, 31 J. SPACE L. 165 (2005).

[12] *Id.*

[13] State practice may be an expression of *opinio juris*, and therefore indicative of crystallising customary international law, *see* North Sea Continental Shelf Cases (Fed. Republic of Germany v. Denmark & Netherlands), 1969 I.C.J 3 (Feb. 1969); and I

from the von Kármán line at the altitude of 100 kilometres,[14] some highly qualified publicists point instead to the lowest achieved perigee of an artificial earth satellite (approximately an altitude of 95 – 110 kilometres).[15]

The difficulty in finding a confirmed determination on the legal boundary delimiting airspace from outer space, and therefore the applicability of air law and space law, is compounded in urgency due to the growth of space tourism activities. In the context of creating a framework for the better applicability of air law or space law however, another issue may perhaps be of help: That of the status of the vehicle in question.

B. Functionalism: Vehicle Status

Another means by which the applicability of air law or space law could be determined is through the vehicle in question. This would take the functionalist approach described above, where the distinctive traits of the vehicle would comprise the conclusive criteria.[16]

The aircraft launch situation described in the Introduction requires the distinction between the carrier aircraft and the spacecraft that is attached to the aircraft until separation. Naturally air law applies to the carrier aircraft for the entire duration of its flight. The issue at hand is whether air law or

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OPPENHEIM'S INTERNATIONAL LAW, 27 (Robert Jennings & Arthur Watts eds., Longman 9th ed.1992).

[14] The von Kármán line is the point at which the aerodynamic lift yields to centrifugal force. It is the commonly accepted point by the International Astronautical Federation (IAF), and has been recently used by the Ansari X-Prize. Further, State practice in this regard can be found in the Australian Space Activities Act as amended in 2002, see Space Activities Amendment Act, 2002, c. 100, (Austl.), An Act to amend the Space Activities Act 1998. *See also* INTRODUCTION TO SPACE LAW, *supra* note 8, at p. 18.

[15] For a legal analysis, see the arguments in CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE, 504 et seq. (New York 1982); Bin Cheng, STUDIES IN INTERNATIONAL SPACE LAW, 497 (Oxford 1997); Stephen Gorove, *Aerospace Object – Legal and Policy Issues for Air and Space Law*, 25 J. SPACE L. 101, 102 (1997); and Katherine M. Gorove, *Delimitation of Outer Space and the Aerospace Object – Where is the Law?*, 28 J. SPACE L. 11 (2000). A good summary of the various demarcations of outer space (for medical, legal, propulsion, administrative and engineering purposes) can be found in C. Laymance, *Science of Space*, *in* SPACE AND MISSILE ORIENTATION COURSE, Vanderberg, pp. 1 – 3 (Air Force Base CA: 30th Operations Support Squadron, 1993).

[16] *See supra* note 6.

space law applies to the attached spacecraft. "Aircraft" is defined in the 1980 Convention on International Civil Aviation as "all machines which can derive support in the atmosphere from the reactions of the air".[17] This definition has been adopted in some national air legislation.[18] It is submitted that until separation, the combined vehicle of the carrier aircraft and its attached spacecraft has all the characteristics of an aircraft, wherein the attached spacecraft is akin to an externally attached cabin. Accordingly, until the event of separation, air law applies to both the carrier aircraft and the attached spacecraft. After the event of separation however, the released space vehicle would no longer "derive support in the atmosphere from the reactions of the air", and should be considered a space object.[19] Further, the purpose of the vehicle would be to reach outer space, therefore supporting its definition as a space object. Accordingly, space law applies to the spacecraft upon separation,[20] and in line with the 1975 Convention on Registration of Objects Launched into Outer Space,[21] space law should continue to apply even upon the re-entry, descent and landing phases of the spacecraft.

The rocket-propelled launch as described in the Introduction does not require the distinction between the launching rocket and the attached capsule. As described in the technical design documents[22] of examples based on this design, both objects are intended to reach outer space through rocket propulsion. As such, based on the functionalist approach, both the launching rocket and the capsule (whether attached or released) are space objects, and accordingly, space law should apply.

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[17] Convention on International Civil Aviation, Dec. 7, 1944, 61 Stat. 1180, 15 U.N.T.S. 295, Annexes 6-8, ICAO Doc. 7300 / 6 (1980) [hereinafter Chicago Convention].

[18] An example of which can be found in Article 1, German Air Traffic Code, LuftVG.

[19] Stephen Hobe, *Aerospace Vehicles: Questions of Registration, Liability, and Institutions – A European Perspective*, XXIX ANNALS OF AIR AND SPACE LAW, 377 (2004).

[20] THE SPACE SHUTTLE AND THE LAW, 4 (Stephen Gorove eds., Mississippi 1980); *see also* M. Hintz, *Weltraumgegenstände*, *in* HANDBUCH DES WELTRAUMRECHTS, *supra* note 11, at 157, 163 et seq.

[21] Convention on Registration of Objects Launched into Outer Space, Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention].

[22] See *supra* note 5.

This functionalist approach will be used in the remainder of the analysis. It is submitted that air law is applicable to the combined space vehicle in the aircraft launch scenario before separation. However, space law is applicable in two scenarios: (1) to the spacecraft in the aircraft launch scenario after separation; and (2) to all the components involved in the rocket-propelled launch.

III. REGISTRATION AND JURISDICTION

Jurisdiction is the authority to make practical binding pronouncements on legal matters and to administer justice within a defined area of responsibility.[23] States have the general jurisdiction to prescribe applicable national laws and to enforce them, and usually require operators to apply for authorisation and licenses to conduct both air and space activities. These mechanisms of authorisation and licensing allow States to supervise the activity and to ensure that the applicable law is enforced.[24] The challenge that arises from space tourism in this regard is two-fold: Under which legal regime should the flight vehicle be registered, and therefore, under which jurisdictional regime should the vehicle, its components, and the flight participants on board fall?

In the aircraft launch methodology, before the event of separation, the spacecraft is part of the carrier aircraft and ergo, both components share the same registration under air law. The rules and procedures of aircraft registration in international air law are governed by Articles 17 – 21 and Annex 7 of the Chicago Convention.[25] Article 17 of the Chicago Convention provides that an aircraft carries the nationality of the State in which it is registered. A detailed framework of air law regulation exists with regard to registration, which simplifies any legal question on the topic.

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[23] Vaughan Lowe, *Jurisdiction*, *in* MALCOLM N. SHAW, INTERNATIONAL LAW, 335-39 (Oxford 6th ed., 2006).

[24] Eileen Denza, *The Relationship between International and National Law*, *in* MALCOLM N. SHAW, INTERNATIONAL LAW, 423, 425 – 27.

[25] *See supra* note 17.

The challenge that arises in the context of space tourism is that the legal environment at the international and national levels for the registration and jurisdiction of such commercial space flight activities is still at a nascent stage and requires both political will and legal expertise for further development.

IV. AUTHORISATION

Authorisation of activities involving aircraft and spacecraft requires a grant of permission from the relevant national authorities. The aircraft launch scenario before separation falls squarely under the authorisation régime of air law. Due to the elaborated framework of air law, the authorisation of the combined aircraft does not raise any thorny legal issues.

However, authorisation must be sought under the space law régime in two cases: after the event of separation in the aircraft launch scenario, and in the event of the rocket-propelled launch scenario. Both cases require international and national authorisation under the corresponding space legislations. Article VI 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[26] obliges States Parties to "authorize and continuously supervise" their national space activities, whether they are of a public or a commercial nature. It has been suggested that the best means of compliance with this obligation is for States Parties to enact applicable national legislation with a licensing mechanism for commercial space activities, including certification of spacecraft.[27] Some States Parties, *inter alia* Australia, Germany, Russia and the United States of America, have enacted licensing regulations for space activities.[28]

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[26] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, art. VI, Jan. 27, 1967, 610 U.N.T.S. 206. [hereinafter Outer Space Treaty].

[27] MICHAEL GERHARD, NATIONALE WELTRAUMGESETZGEBUNG, 37 et seq. (Cologne 2002).

[28] States Parties to the Outer Space Treaty that have enacted national space legislation governing licensing of space activities are Argentina, Australia, Brazil, Canada, Chile, China, France, Germany, Japan, Kazakhstan, Kenya, Norway, Russian Federation, South Africa, Spain, Sweden, Ukraine, United Kingdom and the United States of America. The relevant space legislation may be found in the United Nations Office of

The most detailed framework of national legislation relating to space tourism is that of the United States of America. The U.S. Commercial Space Launch Amendment Act (CSLAA) of 2004 refers explicitly to "space flight participants", providing for licence requirements in the case of "a launch vehicle carrying a human being for compensation".[29] Particularly noteworthy are the regulations that followed by the Secretary of Transport, in particularly those relating to information obligations of the licensee towards the space flight participant, written informed consent, physical examination and training of the space flight participant, as well as security requirements of the space flight. These regulations were enacted with the FAA Draft Guidelines for Commercial Suborbital RLV Operations with Space Flight Participants and its attendant Notice of Proposed Rulemaking for Human Space Flight Requirement for Crew and Space Flight Participants.[30] Arguably, the U.S. approach[31] is perhaps the one step forward that will lead the way for other States. Space tourism's challenge in this regard will be for the international legal community to establish a harmonised framework for authorisation of commercial space activities, both at the international and national levels.

V. LIABILITY ISSUES

Liability and the ancillary financial risks are issues close to the heart of any commercial space tourism operator. Liability may be categorised into passenger liability and third-party liability, the former of which is contract-based between the flight participant and the operator, while the latter is based on damage caused by the flight to an unrelated third party.

Outer Space Affairs, National Space Law Database, *available at* http://www.unoosa.org/oosa/en/SpaceLaw/national/index.html (last visited Dec. 8, 2007).

[29] Commercial Space Launch Amendment Act, 49 U.S.C. § 70105(b)(2)(D) (2004).

[30] Human Space Flight Requirements for Crew and Space Flight Participants, 14 C.F.R. §§ 401, 415, 431, 435, 440, & 460 (2007) & 70 Fed.Reg. 77,261 (2005).

[31] See *infra* section 368.

A. Contractual Liability

Passenger liability issues involve the interface between international and national laws, under the two separate régimes of air law and space law. This section will consider passenger liability at international and national law, as well as the issue of waivers of liability. Space tourism challenges international space law in this regard to ensure the passage of a detailed framework of law that will provide for greater foreseeability in terms of financial and liability risks.

1. Passenger Liability

Before separation of the aircraft launch scenario, the 1999 Montreal Convention for the Unification of Certain Rules for International Carriage by Air governs passenger liability for damage occurring on board an aircraft.[32] The two-tier liability system provided for therein creates a system of unlimited liability for carriers in cases of passenger injury or death, and a system of limited liability in case of delay if the carrier proves that "all necessary measures" were undertaken to avoid any damage. The carrier's liability is limited to 100,000 Special Drawing Rights[33] (SDRs) if the damage was not due to negligence or other wrongful act or omission of the carrier, its servants or agents, or that such damage was solely due to the negligence or other wrongful act or omission of a third party. However, the Montreal Convention applies only to the "international carriage of persons" by aircraft. This may cause an issue if the launch and landing locations of the space tourism vehicle in the aircraft launch scenario is in the airspace of the same country.[34] However, even if the Montreal Convention were deemed not to apply to a particular aircraft launch scenario, the respective national air liability provisions would apply. Given that the Montreal Convention aims at harmonising national air liability laws, this may in practice not create much of a problem.

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[32] Convention for the Unification of Certain Rules for International Carriage by Air, arts. 17-37, May 28, 1999, S. Treaty Doc. No. 106-45 [hereinafter Montreal Convention].

[33] As of June 01, 2007, 1 SDR = USD $ 1.512330.

[34] See *supra* note 9.

In the cases after separation in the aircraft launch scenario, and in the rocket-propelled launch scenario, the provisions of international space law apply. Passengers can potentially raise claims against the space flight operator, other passengers, the vehicle manufacturer, and against the relevant launching State(s). Article III of the 1972 Convention on International Liability for Damage Caused by Space Objects[35] makes a "launching State" liable for damage caused to persons on board a space object where the damage is due to its fault or the fault of persons for whom it is responsible. Article I(c) defines a "launching State" as a State which launches or procures the launch of a space object, or a State from whose territory or facility a space object is launched. Further to this, Article VI of the 1967 Outer Space Treaty[36] makes States Parties "bear international responsibility" for activities in outer space, even where such activities are carried out by non-governmental entities. Such activities require "authorisation and continuing supervision" by the appropriate State. This obligation is generally fulfilled through a licensing process. It is significant to note however, that these treaties do not require States to adopt safety and certification standards for crew, vehicles or passengers.

It has been shown that at present there is no international space legislation that regulates passenger liability. National legislation however, may be used as a source for formulating international legal rules, especially where such legislation is adopted by States whose interests are specially affected by the particular issue at hand. In this regard, the United States of America has established the most sophisticated national space legislation. The regulation of reusable launch vehicles (RLV) by the Federal Aviation Administration (FAA) was governed by the 1998 Commercial Space Launch Act (Title 49 of the US Code, Chapter 701) and the Final Rule of the Commercial Space

[35] Convention on International Liability for Damage Caused by Space Objects, Mar. 29, 1972, 961 U.N.T.S. 187, T.I.A.S. No. 7762 [hereinafter "Liability Convention"].

[36] See *supra* note 26.

Transportation Reusable Launch Vehicle and Reentry Licensing Regulations.[37]

In 2004, the United States enacted the Commercial Space Launch Amendment Act ("CSLAA" – amending Chapter 701 of Title 49 U.S.C.), with the objective "to encourage the development of a commercial space flight industry".[38] Under the CSLAA a licence is required for the launch of a launch vehicle or the operation of a launch site or re-entry site, or for the re-entry of a re-entry vehicle, either in the United States or by a US citizen. The licence requirements are set out in 49 U.S.C. 70105(b). For launch vehicles carrying a human being for compensation or hire, additional licence requirements necessary to protect the health and safety of crew or space flight participants may be prescribed, but only by means of final regulations.

According to 49 U.S.C. 70105(b)(5)(A), the licensee must inform the space flight participant in writing about the risks of the launch and re-entry, including the safety record of the launch/re-entry vehicle type. Moreover, the operator must disclose that participation in space flight may result in death, serious injury, or total or partial loss of physical or mental function. The space flight participant must be given an opportunity to ask questions orally before flight.

2. Waivers of Liability

Under 49 U.S.C. 70112(b)(1) of the 2004 CSLAA, the licensee is required to make a reciprocal waiver of claims with its contractors, subcontractors and customers.[39] While the FAA final rule makes it clear that a space flight participant is not a customer, the operator is not prevented by the CSLAA from making a waiver of liability part of the agreement with a space flight participant except in cases of gross negligence. This is in

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[37] For an account of the RLV Regulatory Regime according to the CSLAA and the Final Rules, *see* Charity T. Ryabinkin, *Let there be Flight: It's Time to Reform the Regulation of Commercial Space Travel*, 69 J. AIR L. & COM. 101 (2004).

[38] 49 U.S.C. § 70105(c). On the objectives of the CSLAA, *see* Spencer H. Bromberg, *Public Space Travel - 2005: A Legal Odyssey into the Current Regulatory Environment for United States Space Adventurers Pioneering the Final Frontier*, 70 J. AIR L. & COM. 639, 658 *et seq.* (2005).

[39] 49 U.S.C. § 70112(b)(1).

line with section 7 (a.)(7) of the FAA Draft Guidelines, which provide that the written informed consent to be signed by the space flight participant should not relieve the RLV operator of responsibility for gross negligence.

B. Third-Party Liability

Third-party liability in the aircraft launch scenario before separation is regulated by the 1952 Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface.[40] The Rome Convention provides for the limited liability of the operator of the aircraft[41] upon proof that the damage on the surface was caused by an aircraft in flight or by any person or thing falling thereof.[42] Unlimited liability applies if the victim proves that damage was caused by a deliberate act or omission of the operator done with intent to cause damage.[43] The Rome Convention is however, hampered by a small number of ratifying States.[44] At the time of writing, the International Civil Aviation Organisation (ICAO) is discussing a re-working of the liability system, to be based on the two-tiered system employed by the Montreal Convention.

After separation in the aircraft launch scenario and throughout the rocket-propelled launch scenario, international space law applies. In this respect, the Liability Convention applies. Article VII(a) however, states that the Liability Convention is not applicable to damage caused to the nationals of the launching State.

VI. STATUS OF FLIGHT PARTICIPANTS

The final challenge of space tourism to the international legal community is the definition, and therefore the rights and obligations, of space flight participants.

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[40] Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Oct. 07, 1952, ICAO Doc. 7364 [hereinafter Rome Convention].

[41] *Id*, at art. 2(1).

[42] *Id.* at art. 1(1).

[43] *Id.* at art. 12(1).

[44] At the time of writing, 49 States had ratified the Convention, *see* ICAO, http://www.icao.int/icao/en/leb/rome1952.pdf (last visited Dec. 8, 2007).

The determination of this inquiry would have a considerable effect on the rights and obligations of such space flight participants. Article V(1) of the Outer Space Treaty[45] obliges States Parties to render to astronauts "all possible assistance in the event of accident, distress, or emergency landing on the territory of another State party or the High Seas". This is further elaborated in the 1968 Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space,[46] which broadens this obligation to include all "personnel of a spacecraft".[47] Given that the Outer Space Treaty in Article V confers the rather lofty status of "envoy of mankind" on all astronauts, it is questionable whether the conception of "astronaut" in this context refers to space tourists as well. The terms "astronaut", "personnel of a spacecraft" and "envoy of mankind" have yet to be defined in international space law.[48] However, given the humanitarian overtones in the rescue of such "personnel of a spacecraft", it could be argued that these rescue obligations would extend as well to space tourists. It is questionable however, whether the privileges and immunities extended to astronauts on national or scientific missions, will also be extended to paying space tourists.[49]

In line with this argument, if space flight participants are to be regarded as "personnel of a spacecraft", then the logical consequence is that the State of registry of the spacecraft exercises jurisdiction and control over the space flight participants

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[45] *See supra* note 26.

[46] Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue Agreement].

[47] *Id.* at art. 1.

[48] Ram Jakhu & Raja Bhattacharya, *Legal Aspects of Space Tourism*, 45 PROC. COLLOQ. L. OUTER SPACE, 112, 119 (2002).

[49] Patrick Collins & Koichi Yonemoto, *Legal and Regulatory Issues for Passenger Space Travel*, 41 PROC. COLL. LAW OF OUTER SPACE 224, 232 (1998); Stephen Gorove, *Interpreting Salient Provisions of the Agreement on the Rescue of Astronauts, and Return of Objects Launched in Outer Space*, 11 PROC COLL. LAW OF OUTER SPACE 93 (1968); Leopold Peyrefitte, DROIT DE L'ESPACE, 195 (Paris, 1993); Lesley Jane Smith & Kay-Uwe Hörl, *Legal Parameters of Space Tourism*, 46 PROC. COLL. LAW OF OUTER SPACE 5 (2003); for another view *see* MARCO G. MARCOFF, TRAITÉ DE DROIT INTERNATIONAL PUBLIC DE L`ESPACE, 265 (Fribourg, 1973).

aboard the spacecraft.[50] Where space flight participants transfer to or visit a spacecraft of another State of registry in outer space, then they would come under the jurisdiction and control of the State of registry of the visited spacecraft.[51]

VII. CONCLUSION

Space tourism gives rise to many normative and practical challenges, the effects of which will be felt for some time in the air and space law community. The issues of the applicability of the law, registration and jurisdiction, authorisation, and liability all lead back to the source questions of international law: those of compliance, enforcement, and the rule of law. Commentary on the challenges posed by space tourism reflects the economic, political and technological advances in the field of space activities; reactions to the ambient developments in the field will determine whether air law and space law will continue to remain relevant in the next evolution of aerospace activities. The legitimacy, cogency, applicability and urgency necessary in addressing these issues become readily evident in the recent developments in the field. The tide of space tourism waits for no law – but the rule of law must prevail in the exploration and use of outer space. It is left to the international legal community to ensure that air and space law are not swept away by the relentless tide of change.

[50] HORST BITTTLINGER, HOHEITSGEWALT UND KONTROLLE IM WELTRAUM, 91 et seq. (Cologne 1988); *see also* George Paul Sloup, *Legal Regime of International Space Flight: Criminal Jurisdiction and Command Authority Aboard the Space Shuttle / Spacelab,* 21 PROC. COLL. LAW OF OUTER SPACE, 148, 151 (1978).

[51] Horst Bittlinger, *Menschen im Weltall*, *in* HANDBUCH DES WELTRAUMRECHTS, see *supra* note 11, 205, 215. For an opposing view, *see* STUDIES IN INTERNATIONAL SPACE LAW, *supra* note 15, at 488.

SUBORBITAL SPACE TOURISM FLIGHTS: AN OVERVIEW OF SOME REGULATORY ISSUES AT THE INTERFACE OF AIR AND SPACE LAW

Melanie Walker

I. INTRODUCTION

This paper focuses on issues and considerations regarding sub-orbital space flights because these flights have a "near term possibility" for space tourism compared to the implementation of orbital flights for that purpose.[1] This distinction is important because, at least for now, the costs of going orbital require "enormous infrastructure."[2] The suborbital market however is driven by adventure entertainment[3] incurring costs at the lower end of the economic scale[4], thereby making the feasibility of the market more likely to exist in the near future.

The Commercial Space Launch Act (CSLA) (2004) is said to have eliminated "confusion over what government agency should regulate sub-orbital aircraft"[5] because the law specifically authorized the Office of Commercial Space Transportation (AST) in the Federal Aviation Administration (FAA)[6] of the U.S. Department of Transportation to regulate the newly-emerging space tourism industry. However, the Congressional delegation of authority has still left room for some confusion because the authority granted to the FAA was first, granted with restriction,

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[1] R.D. Launius and D.R. Jenkins, *Is it Finally Time for Space Tourism?*, 4 ASTROPOLITICS: INT'L J. SPACE POWER & POL'Y, 253, 255 (2006).

[2] Frans G. Von der Dunk, European Centre for Space Law (ECSL) Practitioner's Forum, *Space Tourism: Legal and Policy Aspects*, at iv (March 17, 2006) (on file with author).

[3] *Id.*

[4] Andre Farand, ECSL Practitioner's Forum, *Space Tourism: Legal and Policy Aspects,* at 1 (2006) (on file with author).

[5] Rosanna Sattler, *Transporting a Legal System for Property Rights: From the Earth to the Stars,* 6 CHI. J. INT'L L. 23 (2005), *available at* http://www.mackrell.net/formuploads/epic1_1170261733.pdf (last visited Dec. 2, 2007).

[6] *Id.*

and second, the definition of a "sub-orbital vehicle" is still open for debate.

II. ISSUES

A. Restricted Authority

In order to promote innovation, the FAA is restricted from regulating "design features and operating practices" unless they result in a human space flight incident;[7] a fatal injury;[8] or a serious injury[9] to a space flight participant during a licensed or permitted commercial human space flight.[10] This restriction is authorized until December 23, 2012.[11] In other words, "for the next [5] years, the FAA has to wait for harm to occur, or almost occur, [to an SFP] before it can impose restrictions."[12] Thus, although the FAA is authorized to protect the uninvolved public,[13]

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[7] "Human space flight incident means an unplanned event that poses a high risk of causing a serious or fatal injury to a space flight participant or crew." Commercial Space Launch Act, 14 C.F.R. § 401.5 (2007).

[8] "Fatal injury means any injury which results in death within 30 days of the accident." 49 C.F.R. § 830.2 (2004).

[9] "Serious injury means any injury which (1) requires hospitalization for more than 48 hours, commencing within 7 days from the date of the injury was received; (2) results in a fracture of any bone (except simple fractures of fingers, toes, or nose); (3) causes severe hemorrhages, nerve, muscle, or tendon damage; (4) involves any internal organ; or (5) involves second- or third-degree burns, or any burns affecting more than 5 percent of the body surface." *Id.*; 49 U.S.C.S. § 70105 (2007).

[10] Human Space Flight Requirements (hereinafter HSFR), 71 Fed. Reg. 75616, 75624 (Dec. 15, 2006); 49 U.S.C.S. § 70105. The legislation does not further define what constitutes "during a...commercial human space flight." Current legislation does reference 49 C.F.R. § 830 for other definitions for fatal injury and serious injury. Grouped within this referenced body of legislation, 49 C.F.R. § 830 addresses aviation accidents and incidents as those "associated with operation of the aircraft." It is unclear whether the current legislation for a space flight tourist intended to include injuries that may occur at the launch site independent of the operation of the spacecraft. The fact that the legislators reference other definitions in 49 C.F.R. §830 which include the language about aircraft operation association may suggest that the legislators do not consider injury occurrence to exceed the scope of the space vehicle operation.
49 U.S.C.S. § 70105.

[11] *Id.*

[12] *Id.*

[13] "Uninvolved public" has not been specifically defined. One commentator suggested that it includes "populations living under the flight path of the spacecraft." The term also appears to be used interchangeably with "third party." "Third party" has been defined as "terrestrial populations in flight paths." Molly K. Macauley, *Flying in the Face of Uncertainty: Human Risk in Space Activities*,

it is only authorized to protect space flight participants (SFP)[14] in the circumstances referenced above.[15]

In the absence of such circumstances, the only protection afforded an SFP is the legal doctrine of "informed consent." The new regulations promulgated by the FAA require an operator to inform an SFP of all risks related to launch reentry as well as hazards and risks that could result in serious injury, death, disability or total or partial loss of physical and mental function.[16] Under the new regulations, operators are now also required to inform an SFP that unknown hazards exist as well.[17]

The level of disclosure is limited in one regard. Disclosure regarding the FAA's self-imposed restriction on SFP regulation is left to the operator's discretion.[18] Thus, an operator does not have to disclose the FAA's own restriction on regulating safety of SFPs relating to "design features and operating procedures" unless a serious injury or fatality occurs.[19]

The rationale for this restriction is based on protecting and promoting innovation, which is premised on the idea that too much safety regulation might suffocate the industry and prevent its growth.[20] However, an SFP might be hesitant to participate if they were aware of the FAA's decision to refrain from involving itself so early in the industry's nascent. Thus, the fact that the FAA leaves the disclosure of this information to the operator's discretion offers the SFP very little information at all.

Another consideration of why the informed consent doctrine may not be sufficient protection with respect to this industry is the issue of duty. One commentator suggested it is the duty of the SFP to research design features that affect personal risk.[21]

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6 CHI. J. INT'L L. 131 (2005).

[14] A space flight participant is "an individual, who is not crew, carried aboard a launch vehicle or reentry vehicle." HSFR, *supra* note 10, at 75631.

[15] *Id*. at 75618.

[16] 14 C.F.R. § 460.45 (2007).

[17] HSFR, *supra* note 10, at 75624.

[18] *Id.*

[19] *Id.*

[20] Timothy Robert Hughes & Esta Rosenberg, *Space Travel Law (And Politics): The Evolution of the Commercial Space Launch Amendments Act of 2004*, 31 J. SPACE L., at 46 (2005).

[21] HSFR, *supra* note 10, at 75624.

The FAA however, disagreed and recognized that an SFP will "come from 'all walks of life'" with varying degrees of technical expertise and understanding."[22] By placing the duty to warn on the space tourism company, the FAA's disposition regarding duty is consistent with the doctrine of informed consent. The doctrine of informed consent, most commonly known in the physician-patient context, places the duty on the physician to warn the patient of any material risks.[23]

However, "the full range of risks in the new suborbital market is not yet realized, and standards, policies and procedures to minimize risk have not yet been developed. As a result, effective warnings are difficult to articulate."[24] Unlike the physician-patient context, "one of the primary hazards or risks associated with space travel is that there are no accepted industry standards."[25] Thus, without accepted industry standards it may be difficult to ascertain whether a party has fulfilled their duty. This leaves the SFP with very little to rely on if informed consent is currently their only protection.

The informed consent doctrine also poses difficulty in assessing whether an SFP truly understands the risks associated with the specific vehicle boarded by the SFP. "All risk potentially affecting the decision must be unmasked."[26] In the case of a reusable launch vehicle (RLV) the risks associated with the specific vehicle are likely to vary with each flight. Reusability of any vehicle will eventually wear with use and time. Thus, an SFP on an RLV with a longer launch history may be more susceptible to risk than an RLV with a shorter launch history. Arguably a longer launch history may suggest the RLV's ability to withstand multiple flights safely. This longer track record could suggest that the vehicle is both safe and reliable.

On one hand, this variance in technological expertise is the reason why the FAA should impose restrictions on the industry.

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[22] *Id*.

[23] Cynthia Dokas, *The Duty to Warn in Aviation Law: A New Tort Theory in the Aftermath of Pan American Flight 103,* 8 N.Y.L. SCH. J. HUM. RTS. 227, 243 (1990).

[24] Tracey Knutson, *Informed Consent for Spacefaring Passengers*, SPACE NEWS, April 30, 2007, at 17-18..

[25] *Id.*

[26] *Canterbury v. Spence*, 464 F.2d 772 (1972).

Although requiring disclosure of a safety record does not circumvent the fact that an SFP may lack the technological understanding to interpret such mandated disclosures.[27]

Moreover, the FAA's focus on the uninvolved public as the primary party deserving protection is inconsistent with the FAA's role of safety regulation because the uninvolved public is the one party that is least likely to be at risk. Regarding test flights, one industry leader, Mr. Burt Rutan, commented that "...the government, was only interested in the best safety for people on the ground...there's been hundreds of accidents with research airplanes but nobody's ever been hurt on the ground." Mr. Rutan further commented that the CSLA "didn't address the problem [of]....getting an FAA acceptance of the safety of passengers."[28] Although thousands of people are likely to be present during a test launch and susceptible to risk of injury from falling debris, there are many test flights that occur before a public test launch in which passengers are present but the uninvolved public is not. Since, the passenger is exposed to more risk than the uninvolved public, the focus on passenger safety should not be neglected.

This is not to say that the FAA's approach of focusing on the uninvolved public is indefinite. The FAA will begin regulating the industry in 2012, if not sooner, should there be a human space flight incident, fatality, or serious injury to an SFP.[29] Thus, the FAA may eventually shift its focus of safety regulation to include passengers and those who are susceptible to greater risk.

B. Laissez-Faire Approach or Not?

"Congress is clearly saying that it doesn't want to be a barrier…It wants to open doors and fly the American public into

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[27] The FAA requires an operator to provide a safety record of launch or reentry human rated vehicles.
HSFR, *supra* note 10, at 75624.

[28] Interview by Ted Balaker with Burt Rutan, Space Entrepreneur, Scaled Composites (Apr. 2005), http:www.reason.org/apr2005/space_travel.html (last visited 04/25/07).

[29] HSFR, *supra* note 10, at 75624.

space."[30] Yet, other commentators argue "[t]he single biggest factor facing the private sector in reaching orbit or interplanetary or even reaching the surface of the moon is the United States Congress."[31]

One Senator argued that the amendments were made to reduce government interference and protect the industry.[32] This is important because the legal framework and regulations cannot be addressed without discussing whom the law is designed to protect. The current law is designed to protect the space industry. Space industry leaders fought for minimal regulation and many of them claim that the industry does not advocate a *laissez -faire* approach to space tourism policy.[33] However, the facts that led to the adoption of the regulations and the regulatory result indicate this is the case.

Opponents of the original bill[34] that proposed an 8-year hold on the industry's regulation criticized the adoption of a *laissez-faire* approach because refraining from regulation until a fatality occurs precludes the prevention of harm, which is inherent to the government's role of protecting public safety. Although many commentators argue that regulation will stifle the industry, at least one industry leader stated that he is not opposed to regulation.[35] Regulation is not the issue.[36] The issue, according to this view, is that the regulators lack the knowledge and experience of regulating experimental vehicles that are yet to be in existence.[37] In other words, the regulators do not know, and can not know, what it is that they are to regulate.[38]

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[30] Alan Boyle, *Private-spaceflight bill signed into law* (2004), http://www.msnbc.msn.com/id/6682611 (last visited Dec. 2, 2007) (quoting James *James* Muncy, Space Policy Consultant in response to the Commercial Space Launch Amendments Act, H.R. 5382).

[31] Catherine E. Parsons, Comment, *Space Tourism: Regulating Passage to the Happiest Place Off Earth*, 9 CHAP. L. REV. 493, 509 (2006) (quoting Stuart Witt, Manager of the Mojave Spaceport).

[32] Parsons, *supra* note 31, at 513.

[33] *Id.*

[34] H.R. 3752, 108th Cong. (2004).

[35] *See supra* note 28.

[36] *Id.*

[37] *Id.*

[38] *Id.*

If the regulators are going to authorize permitting an SFP to assume risks that are tantamount to voluntarily offering oneself as an "experiment" for the sake of promoting innovation and to advance the industry's economic interests, then the Government should also require that an SFP be fully informed by the entity offering the commercial service. If a space tourism company is authorized to use a government launch facility an SFP might be misled into thinking that it is a government sponsored launch, especially an activity that falls within the definition of government "involvement." U.S. government involvement exists when a launch operator launches from a U.S. Government facility or when a U.S. Government payload or personnel is being transported.[39]

14 CFR §440.17(e) requires an SFP and crew to waive any claims that might otherwise be filed against the U.S. Government for "participation in a launch or reentry in which the U.S. government, any of its agencies or its contractors and subcontractors is involved."[40] Blue Origin[41] suggested that the FAA specify the definition of government "involvement" for purposes of knowing exactly when a waiver of claims is triggered.[42] Blue Origin further commented that FAA authorization of launch or reentry is a means of oversight and does not constitute government "involvement." The FAA agreed based on the fact that the FAA is functioning in its regulatory capacity.

Another commentator argued that this requirement "deprives the SFP or crew member of a normal expectation of customary behavior on the part of the operator by virtue of the normal potential for legal liability."[43] An SFP might choose to decline the offer of services, if he or she learns that not even a minimum standard has been set for SFP safety.

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[39] HSFR, *supra* note 10, at 75628.

[40] *Id.* at 75627.

[41] Blue Origin is a private aerospace company pursuing both sub-orbital and orbital flights. *See* Alan Boyle, *Amazon Founder Unveils Space Plans: Bezos' Blue Origin Venture to Build West Texas Rocket Facility* (Jan. 13, 2005), http://www.msnbc.msn.com/id/6822763/ (last visited Dec. 2, 2007)*; See also* Blue Origin website, http://public.blueorigin.com/index.html (last accessed Dec. 2, 2007).

[42] HSFR, *supra* note 10, at 75628.

[43] *Id.*

One change resulting from the recent regulations is that §460.45(g) requires the SFP to be given an opportunity to orally ask questions regarding the hazards and risks.[44] "The FAA hopes that this will allow the SFP to have a chance to get clarification on any information that may be confusing or unclear."[45] It is questionable, however, whether an SFP would know what kinds of questions to ask. For example, an SFP is likely to make general inquiries related to quantity of accidents. The SFP may not have enough information to make more specific inquiries. For example, an SFP may not think to pose questions that would distinguish between quantity of accidents that occurred in the air or on the ground.[46] It is unclear that an SFP would know, just by reading an SFP informed consent form, what risk he or she is assuming.

C. Informed Consent

Informed consent is the legal doctrine that governs the risks that may be assumed by the SFP. "Informed consent" is "a person's agreement to allow something to happen, made with full knowledge of the risks involved and the alternatives."[47] "True consent to what happens to one's self is the informed exercise of a choice, and that entails an opportunity to knowledgeably evaluate the options available and the risk attendant upon each."[48] However, the issue of determining whether a person's consent is informed, is predicated on numerous factors including the type of information provided; adequacy of information; and, the person's appreciation of that information.

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[44] HSFR, *supra* note 10, at 75627.

[45] *Id.*

[46] The FAA requires the safety record disclosure to include accidents that occur on the ground. The Federation commented that disclosure should not include accidents that occur on the ground. This is just one example where an SFP may not know what specific questions to ask regarding a minute detail. The Federation is a group of spaceship developers and operators, spaceports, destinations and transportation agents. Members include Bigelow Aerospace, Virgin Galactic, Armadillo Aerospace, the X PRIZE Foundation and Rocketplane-Kistler. The Space Fellowship, http://spacefellowship.com/News/?cat=53 (lasti visited Dec. 3, 2007).

[47] BLACK'S LAW DICTIONARY (8TH ed. 2004).

[48] *Canterbury,* 464 F.2d 772.

The only mandatory informed consent requirements imposed by the FAA are that the SFP understands the risk associated with being an SFP aboard the specific vehicle and that his or her presence on board is voluntary.[49] Section 460.45 requires an operator to inform an SFP in writing of launch and reentry risks including "known hazards and risks" resulting in "serious injury, death, disability, or total or partial loss of physical and mental function."[50] An operator must also inform the SFP that "unknown hazards" exist.[51] The new regulations prohibit an SFP and crew from bringing a claim against the U.S. Government by imposing a waiver of claims.[52] In addition, this waiver extends to bringing a claim on behalf of crew and SFP including heirs, administrators and assignees.[53]

One industry leader responded to this requirement[54] by suggesting that the FAA require the disclosure of its self-imposed, temporary restraint on regulating design and operations of the industry.[55] The FAA, however, left this to the discretion of the operator.[56] This seems inconsistent with guaranteeing "risk information adequacy" because for information to be adequate, it should be complete and allowing the exclusion of regulatory restraint information creates an informational void. However, the FAA does require the operator to inform the SFP that the U.S. Government has not certified the launch vehicle and any reentry vehicle as safe. This might imply that the FAA did not entirely overlook the importance of this type of information.

The new Federal regulations attempt to achieve an "acceptable level of safety to the general public" and to ensure that [SFPs] are "aware of the risks" associated with launch or reentry.[57] Attempting to achieve a level of safety by relying on in-

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[49] *Id.*

[50] HSFR, *supra* note 10, at 75624.

[51] *Id.*

[52] *Id.* at 75627.

[53] *Id*.

[54] 14 C.F.R. § 440.17(e) and (f) require SFP and crew to waive any potential claims that could be filed against the U.S. government.

[55] HSFR, *supra* note 10, at 75624.

[56] *Id*.

[57] *Id.* at 75616.

formed consent is difficult because even if the level of information provided to the SFP is adequate, there exists a greater issue, one of cognizance. "The kind of threshold that we will have to figure out how to achieve is the cognizance issue. How do we know that [an SFP] understand[s] the risk that they are taking?"[58] The FAA addressed this issue by implementing a "cognizance test" that allows the SFP to clarify confusing issues by orally asking questions prior to flight.[59] This "cognizance test" may be insufficient.

Even industry leaders are aware that informed consent does not function as simply as it sounds. They have acknowledged the difficulty of insuring their duty to inform is met by taking extreme measures to filter out any ambiguity. Greg Maryniak, Executive Director of the X-Prize Foundation suggested advising the SFP to draft a will prior to space flight.[60] Jeff Greason, president of X-Cor acknowledged the necessity of a written notice including blatant statements such as "You have a 1 in 14 chance of dying on this flight." Yet, Mr. Greason also acknowledged that a written notice may not be enough.[61] He stated that in addition to a written notice, he would provide the SFP with dramatic videos portraying catastrophic rocket accidents.[62]

These suggestions do address the concern that the industry might mask the true risks posed by space flight by failing to include them in their disclosure.[63] Moreover, these suggestions imply that some industry leaders understand the complexity of

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[58] Brooke N. Weeber, Dirk C. Gibson, and Matthew Petrunia, *Adequate Risk Communication & Informed Consent: The Duty to Warn, Judicial Warning Adequacy Standards, and the Federal Aviation Administration's Proposed "Human Space Flight Requirements for Crew & Spaceflight Participants*, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, SPACE 2006 (Sept. 2006); John Antczak, *Space Tourism Safety Weighed: Regulations Being Developed by FAA*, (Oct. 11, 2004) http://www.enquirer.com/editions/2004/10/11/biz_spacetourism11.html (Quote by Patti Grace Smith, FAA Associate Administrator in the Office of Commercial Space Transportation in 2004).

[59] HSFR, *supra* note 10, at 75626.

[60] Laura Montgomery, *Space Tourism and Informed Consent: To Knowingly Go*, 51 FED. LAW 26 (July 2004).

[61] *Id.*

[62] *Id.*

[63] *Id.*

informed consent and the importance of adequately informing an SFP so as to avoid liability.

However, this does not address the crux of the "cognizance" issue which turns on one's appreciation of the information rather than adequacy of the information itself. The CEO of Incredible Adventures[64] expressed her concern about this by commenting that despite the non-conspicuous language on the informed consent form provided to her consumers, the consumer is not able to conceptualize the risk because they are seeking her service for the sake of adventure.[65] In this context, the consumer is paying for a thrilling experience filled with risk.[66] The consumer is attracted to the activity precisely because of the risks involved.[67] Thus, the consumer's frame of mind lacks the cognitive ability to appreciate the risk of which they are being informed.[68]

D. Liability and Allocation of Risk

There are three major categories of potential parties that would be able to file a claim against the U.S. or a space tourism company.[69] They are, 1. third parties identified as the "uninvolved public"; 2. an SFP; and 3. a foreign State.

1. "Uninvolved Public" Third Party Liability

The U.S. Government has agreed to help promote industry growth by participating in a "liability risk-sharing regime."[70] This regime requires a licensee to purchase insurance for all

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[64] Jane Reifert, CEO of Incredible Adventures, Presentation at 2006 AIAA Space Conference (Sept. 19-21). 2006 Incredible Adventures offers adventure tours such as zero-g flights, shark dives and piloting your own bi-plane rides. *See also* Incredible Adventures website, http://www.incredible-adventures.com/ (last visited Dec. 3, 2007).

[65] *Id.*

[66] *Id.*

[67] *Id.*

[68] *Id.*

[69] Space tourism company, in this context, refers to the holder of the launch or reentry license or the launching company.

[70] *See* Hughes and Rosenberg, *supra* note 20, at 31.

participants[71] of the launch based on the FAA's maximum probable loss (MPL) determination.[72] The MPL determination is a methodology used to analyze and assess the maximum monetary damages that may be suffered by the U.S. Government and any third party.[73] The MPL is based on an evaluation of government and third party property that is at risk of damage.[74] Once a licensee has received an MPL evaluation determining the licensee's financial responsibility; the licensee must provide proof that funds are available to cover the determined amount.[75] Currently the required insurance for a space tourism company is capped at $500 million(U.S.) or the maximum liability insurance available at a reasonable cost in the event they are held liable for a third party claim.[76] The required insurance policy not only protects the space tourism company but includes coverage for the U.S. Government, at no cost to the Government.[77]

2. Space Flight Participants

The U.S. Government has not agreed to indemnify space flight participants. When the bill[78] to amend the CSLA was first proposed, the Committee on Science opined that "space flight participants wishing to ride on board a launch vehicle have chosen to undertake a risky venture of their own accord." As such, they do not merit the financial security provided by the promise of indemnification."[79] The Committee suggested that SFPs should pay for their own insurance and even suggested that the

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[71] H.R. 3752, *supra* note 34. This does not include an SFP. "The Committee (on Science) believes that [an SFP] ...can purchase their own insurance or that licensees or transferees may purchase insurance plans that expressly cover claims against space flight participants." *Id.*

[72] *Id.*

[73] Reusable Launch Vehicle Financial Responsibility Determination, http://www.faa.gov/about/office_org/headquarters_offices/ast/licenses_permits/launch_reentry/reusable/financial/index.cfm?print=go (last visited Dec. 3, 2007).

[74] *Id.*

[75] *Id.*

[76] 49 U.S.C.S. § 70112 (2007).

[77] *Id.*

[78] H.R. 3752, *supra* note 34.

[79] *Id.*

space tourism company may purchase insurance that covers the SFP.[80]

An SFP raises a new set of potential risks that did not arise previously with professional astronauts. For example, an SFP is susceptible to not only bodily injury– but also financial losses, in the event the SFP is disqualified for medical conditions or dies before the flight.[81] One commentator also raised the issue of political risk which may affect approving the license to fly.[82]

3. Foreign States

The Convention on International Liability for Damage Caused by Space Objects[83], to which the United States is a State-Party, holds the launching state "absolutely liable…for damage caused by its space object on the surface of the Earth or to aircraft in flight."[84] In the event that a claim by a foreign State is made against the U.S. government, the space tourism company's insurance policy will cover the U.S. government.[85]

E. Experimental Permit v. License

Prior to the CSLAA, a license was the only means for authorizing a launch or reentry.[86] With the advent of the CSLAA, the FAA was granted the authority to issue experimental permits.[87] Experimental permits differ from licenses in various ways. First, experimental permits, unlike a license, are not

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[80] *Id.*

[81] Guillaume de Dinechin, *Astronauts in Space: Liability and Insurance Coverage, available at* http://portal.unesco.org/shs/en/files/8474/11224582491deDinechin_paper.pdf/deDinechin_paper.pdf
(last visited Dec.2, 2007).

[82] *Id.*

[83] Convention on International Liability for Damage Caused by Space Objects, March 29, 1972, 24 U.S.T. § 2389.

[84] *Id.* at art. II.

[85] Hughes & Rosenberg, *supra* note 20, at 31.

[86] FAA Guidelines for Experimental Permits for Reusable Suborbital Rockets (May 2005), http://www.faa.gov/about/office_org/headquarters_offices/ast/media/EP_Guidelines_ver1.pdf.

[87] *Id.*

transferable.[88] Second, experimental permits do not allow operation of the vehicle for carrying "any property or human being for compensation or hire."[89] Arguably the most critical difference is that damages incurred during an experimental permitted launch or reentry are ineligible for indemnification. In contrast, damages that result from a licensed launch or reentry are eligible for indemnification, "to the extent provided in an appropriation law or other legislative authority."[90] Lastly, a permit must authorize an unlimited number of launches and reentries whereas a license is not required to do so.[91]

F. Commonalities with International Maritime Law

Although aviation law is more often considered the most relevant analogue to space law, international maritime law may be just as relevant because it consists of similar principles and it has already successfully dealt with some of the same challenges now facing regulators of international space law. For example, the Outer Space Treaty[92] specifically states that outer space "is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means."[93] Likewise, the Law of the Sea Convention states "the high seas being open to all nations, no State may validly purport to subject any part of them to its sovereignty."[94]

The nature of commercial space tourism is very similar to the cruise industry with respect to the primary purpose of transportation. The product offered by both is a temporary experience that offers more than the mere transportation of a passenger from one destination to another. Like the product offered by cruise ships, commercial vehicles like *SpaceShipOne* offer an

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[88] *Id.*

[89] *Id.*

[90] *Id.*

[91] *Id.*

[92] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies art. II, Jan. 27, 1967, 18 U.S.T. 2410 [hereinafter the Outer Space Treaty].

[93] *Id.*

[94] Law of the Sea: Convention on the High Seas, art. II, Apr. 29, 1958, 13 U.S.T. 2312 [hereinafter Law of the Sea Convention].

experience while aboard the vehicle as passengers are able to observe outer space while remaining in the vehicle.

Generally speaking, airline passengers have no interest in boarding a plane for the experience alone. They board the aircraft to get to their ultimate destination. The airplane is merely a means of transport. However, the space vehicle is more like a luxury cruise liner in that the "ship [is] the destination."[95] Thus, "the comparison of luxury cruises to space tours appears valid."[96]

Moreover, a major outer space concern that is not exclusive to commercial space tourism is orbital debris. "More than one hundred thousand pieces of space junk are floating in orbit around the Earth and...if no steps are taken to reverse the growth...the likelihood of collisions between pieces of debris or between debris and active space objects will increase."[97] Orbital debris is most concentrated in low Earth orbit which is the primary destination of commercial space tourism.[98] Pollution of the sea, most prevalent by oil spills is an issue that maritime law regulators have been facing for years.[99] Thus, unlike aviation, pollution of the marine and space environments is an issue of equal and great importance.

Lastly, the issue of boundary has arisen in the context of both maritime and space law. Maritime law has addressed the issue by recognizing Nation-States' jurisdiction over territorial waters that extend twelve nautical miles off their coast.[100] Jurisdiction over international waters beyond the Nation-State's territory is governed both by the Convention of the Law of the Sea and international customary law.[101]

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[95] Sarah J. Tomlinson, *Smooth Sailing? Navigating the Sea of Law Applicable to the Cruise Line Industry*, 14 VILL. SPORTS & ENT. L.J. 127, 133. (2007).

[96] Daniel L. Britt, *A Space Access Architecture Supporting Large-Scale Space Tourism*, AMERICAN INSTITUTE OF AERONAUTICS AND ASTRONAUTICS, SPACE 2006, at 9 (Sept. 2006).

[97] Steven A. Mirmina, Note, *Reducing the Proliferation of Orbital Debris: Alternatives to a Legally Binding Instrument,* 99 AM.J.INT'L L. 649 (2005).

[98] *Id.* at 651.

[99] Jason Haile, *The New Age of Conquest and Colonialism: How Admiralty Will Be Used on the Final Frontier*, 29 TUL. MAR. L.J. 353, 365 (2005).

[100] Law of the Sea Convention, *supra* note 94, 13 U.S.T. 2312.

[101] Tomlinson, *supra note* 95, at 137-138.

Jurisdiction over where air space ends and outer space begins has yet to be determined. Maritime law however offers two interesting perspectives for applying it as an analogue. One perspective suggests that the current law regarding outer space is analagous to maritime law as it exists now. The fact that each Nation-State has sovereignty over its air space[102] resembles the notion that each Nation-State is similar to the sovereignty that a Nation-State has over its coastal waters. The fact that outer space is not subject to territorial sovereignty is similar to the notion that beyond a coast's territorial waters, international waters are free also of territorial sovereignty.

A second perspective would be to consider that each Nation-State have its territorial sovereignty over its air space extend beyond the atmosphere to a specified boundary. Anything beyond this boundary would then be considered "international space", free from any claim of sovereignty. This issue related to boundary identification, sovereignty right expansion is not as prevalent in aviation law and thus makes maritime law a very useful analogue in setting precedents.

Despite the many similarities that exist between the two bodies of law; one aspect that raises the most concern is passenger safety. Some commentators argue that maritime law is outdated and, as a result, provides more protection to the cruise line industry rather than its passengers.[103] In maritime law, once the cruise ship is outside the realm of U.S. territorial waters, often unbeknownst to the passenger, there is very little authority the U.S. government has to protect the passenger.[104] Similarly, U.S. space law seems to be heading in this direction as the FAA is more focused on protecting the uninvolved public than protecting the SFP.

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[102] Convention on International Civil Aviation, art. I, Dec. 7, 1944, 61 Stat. 1180 [hereinafter Chicago Convention]. Article I states that "[t]he contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory."

[103] Thomas A. Dickerson, *The Cruise Passenger's Dilemma: Twenty-First-Century Ships, Nineteenth-Century Rights,* 28 TUL. MAR. L.J. 447, 451 (2004).

[104] *Id.* The Athens Convention limits a passenger's recoverable damages to the value of the vessel, so long as the ship has not touched a U.S. port.

G. Jurisdiction I: Determining the Applicable Legal Regime

Since the space vehicle must traverse air space into outer space[105] and likely will travel over water;[106] the object's presence in both geographical realms fosters a debate over which legal regime is applicable. Some commentators[107] suggest that the regime should be predicated on the location of the "aerospace object."[108] Thus, while the "aerospace object" is in air space, aviation law should govern and while the "aerospace object" is in outer space, space law should govern.[109] This approach focuses on physical location of the "aerospace object."

Other commentators[110] suggest the nature of the activity and purpose of the object should be considered.[111] In other words if the object is merely passing through airspace to achieve its primary purpose of reaching outer space, the applicable regime should be based on outer space, rather than associating the object with airspace which is merely a temporary location.

In determining the applicable legal regime, physical presence cannot be overlooked. This is especially true with regard to lawsuits arising out of death or injury. For example, an accident may occur upon reentry. In this case, the space vehicle may

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[105] Outer space in this context is being used to describe the entire realm that exists beyond the atmosphere.

[106] Virgin Galactic is launching out of the Mojave desert hoping to offer its space flight participants a view of the Pacific Ocean. *See* Virgin Galactic, *Where will I fly from?*, http://www.virgingalactic.com/htmlsite/overview.php (last viewed Dec. 2, 2007).

[107] Respondents to a questionnaire posed by the U.N. Committee on the Peaceful Uses of Outer Space (COPOUS) include Chile, Brazil and Fiji. *Compilation of Replies Received from Member States to the Questionnaire on Possible Legal Issues with Regard to Aerospace Objects*, U.N. COPOUS, U.N. Doc. A/AC.105/635/Add.10 (2004), http://www.unoosa.org/docs/misc/aero/aero_compE.doc (last visited Dec. 2, 2007).

[108] *Id.* The term "aerospace object" is used in a very broad sense and was not defined in the questionnaire. The introductory note uses aerospace object in referring to space objects and the questionnaire explores the issue of objects that are capable of traversing both air and space. Respondents varied in their own definition of an aerospace object. Some respondents regarded an aerospace object as an object designed for the exploitation in outer space. One respondent suggested that some aerospace objects have aerodynamic properties that do not allow the object to remain in airspace, thus classifying the object as an aerospace object would be too restricting. The questionnaire asked how to characterize an aerospace object and thus, this term is used in a broad sense to refer to all possible aerospace objects.

[109] *Id.*

[110] *Id.* Respondents to U.N. COPOUS questionnaire include Costa Rica and Benin.

[111] *Id.*

disintegrate over any area of terrestrial land or water. When aviation accidents occurred over seas, some claims incorporated maritime law. Families of the deceased argued for application of the Death on the High Seas Act (DOHSA).[112] DOHSA provides a remedy for victims of families lost at sea[113] which offers greater compensation than the remedy provided for in aviation law. It was traditionally established for accidents occurring to sea vessels but was later held applicable to aircraft tragedies that occurred over seas.[114]

In addition, when the space shuttle *Challenger* exploded, the families of the deceased tried to file a claim against NASA but were limited by the Federal Sovereign Immunities Act (FSIA).[115] However, upon further investigation, after finding that the *Challenger* had exploded due to faulty o-rings which were applied to the space shuttle[116], U.S. courts determined that the U.S. Government was not able to assert its immunity under the FSIA and the plaintiffs were able to recover for damages.[117] In this case, the issue of jurisdiction rested on where the cause of the tort occurred.

H. Jurisdiction II: Choosing a Forum

Another aspect of jurisdiction includes choosing the forum in which to file a claim. Virgin Galactic, a company owned by British entrepreneur, Richard Branson, intends to offer suborbital flights out of California's Mojave Desert.[118] Virgin Galactic's website can be accessed from any geographical point around the world, and invites a potential SFP to book his or her flight from the website. In addition, Virtuoso, the exclusive

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[112] *Id.* at 511.

[113] *Id.*

[114] *Id.*

[115] James A. Beckman, *Citizens Without a Forum: The Lack of an Appropriate and Consistent Remedy for United States Citizens Injured or Killed as the Result of Activity Above the Territorial Air Space,* 22 B.C. INT'L & COMP. L. REV. 249 (1999).

[116] *Id.*

[117] *Id.* (Where the Federal Tort Claims Act is applicable, the defense by the U.S. government is to assert the FSIA. In this case, outer space was considered "foreign territory".)

[118] Virgin Galactic also intends to launch flights from a spaceport in New Mexico. *See* Virgin Galactic, *supra* note 106.

travel agency booking sub-orbital space flights for Virgin Galactic[119] has agents worldwide, with the largest group of "accredited space agents"[120] based out of the U.S.[121] Thus, if an SFP has standing to file a claim, it is unclear where the claim could potentially be filed. Virgin Galactic, a subsidiary of the Virgin Group[122] may assert that England, its home nation, has jurisdiction and the SFP may assert jurisdiction lies in his or her home nations, the location where he or she called, or where he or she accessed the travel agency website.

Moreover, if there was a potential claim against the travel agency, the travel agency may assert jurisdiction lies in the state, province and/or Nation that the agent was located or where the agency has its corporate headquarters. Separate liability against the travel agency may not be an issue for Virgin Galactic because "accredited space agents" booking sub-orbital flights function as agents of Virgin Galactic and not the travel agency with which they are affiliated.[123] Unlike civil aviation flights, where flights booked through a travel agency involve paperwork and electronic correspondence provided by the travel agency; all forms provided for sub-orbital space flights, including the contract and consent forms are sent directly from England, by Virgin Galactic.[124] Consumers of a sub-orbital flight,

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[119] Kimi Yoshino, *Selling Trips to the Lap of Luxury*, L.A. TIMES, Aug. 25, 2006, at C7.

[120] There are about 46 "accredited space agents" worldwide. A total of 170 agents from Virtuoso applied to be "accredited space agents" for Virgin Galactic, 46 of whom were selected and trained by Virgin Galactic.
The space agents function as an agent of Virgin Galactic and not the travel agency which they are affiliated with. Telephone interview with Mr. Peter Friedman, Accredited Space Agent for Virgin Galactic (May 10, 2007).

[121] *See* Virtuoso website, www.virtuoso.com/us/ (last visited Dec. 3, 2007). "Accredited space agents" are actually representatives of other travel agencies based throughout the U.S. including states such as Maine, Florida, California, Alabama. *See also* www.virtuoso.com/us/Specialists/ (last visited Dec. 3, 2007). Telephone interview with Mr. Peter Friedman, Accredited Space Agent for Virgin Galactic, (May 10, 2007).

[122] The Virgin Group is headquartered in London, England. Global Business Directory, http://www.medibix.com/company.jsp?company_id=10010865 (last visited Dec. 2, 2007).

[123] Telephone interview with Mr. Peter Friedman, Accredited Space Agent for Virgin Galactic, in Fla.
(May 10, 2007).

[124] Telephone interview with Mr. Craig Buck, Accredited Space Agent for Virgin Galactic, in Cal. (May 10, 2007).

therefore will be provided with a consent form by Virgin Galactic.[125] No other consent form from the local travel agency with which the "accredited space agent" is affiliated will be provided.[126]

Another distinction between travel agencies used for civil aviation flights and those employed for space flights is that no monetary exchange is made between the "accredited space agent" travel agency and the consumer.[127] In fact, the only method of paying for the sub-orbital flight is for the consumer to directly wire the funds to the appropriate Virgin Galactic account from their own bank account.[128]

In maritime law with respect to determining jurisdiction applicable to a passenger's claim, many courts have adopted the "solicitation – plus" doctrine.[129] Rather than focusing on the physical location of the vehicle providing the travel, the "solicitation – plus" doctrine focuses on the physical presence of where the ticket to travel was purchased. [130]

Since most passengers board a cruise ship to leave their current location, a passenger is likely to have purchased his or her ticket in a city other than the intended destination. In some cases, the passenger flies to the city where the cruise ship departs. Then, the cruise ship travels beyond the territorial waters of the departing State, often arriving in the territory of another State. This raises many possible forums for filing a claim. It is likely that sub-orbital flights will raise a similar issue because the company is based out of one State, launches from another State, and the SFP is likely to purchase his or her ticket from whichever State they accessed the internet.

Thus, the issue regarding jurisdiction does not necessarily have to rest on one body of law. The multi-faceted nature of space law requires applying multiple bodies of law in order to properly develop its fundamentals. It encompasses tort law in regards to informed consent and liability; contract law in re-

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[125] *Id.*
[126] *Id.*
[127] *Id*.
[128] *Id.*
[129] Dickerson, *supra* note 103, at 482.
[130] *Id.*

gards to informed consent, launch arrangements and manufacturing; international law in regards to treaties and bilateral agreements; and, civil procedure and conflict of laws in regards to jurisdictional issues. It should follow that precedents from both aviation and maritime law are equally relevant. Thus, the nation of the SFP in developing its space law should incorporate a cross-section of all relevant areas of the law, rather than isolating one category of law to which definitions and labels must properly conform. The debate seems to emphasize aviation law as a precedent but there are other bodies of law that are being overlooked which can prove to be just as helpful in formulating the legal structure and framework for space law.

I. Aircraft vs. Spacecraft

The U.S. definition of a "suborbital rocket" is a "rocket propelled vehicle intended for flight on a suborbital trajectory, whose thrust is greater than its lift for the majority of the powered portion of its flight."[131] The FAA clarified that physics is the determining factor for distinguishing launch vehicles from aircraft.[132] Although a vehicle has the potential of being classified as a "hybrid"[133] by having both aircraft and rocket characteristics, one member of Congress disagreed with allowing such a hybrid vehicle to be subject to two separate regulating agencies.[134]

Perhaps there is no way of avoiding having a vehicle being subject to two different legal regimes when both regimes are applicable based on its operational characteristics. For example, there is a current terrestrial vehicle that has been in use since

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[131] 68 Fed. Reg. 59977-79 (Oct. 20, 2003).

[132] *Id.*

[133] There are two types of hybrid vehicles. One type refers to a vehicle that has both aviation and space technology, each of which is employed at various stages of the flight. The second type refers to two vehicles which are combined to form a launch system but allows each to still operate independent of the other at a particular stage of the flight. 68 Fed. Reg. at 59977.

[134] Excerpts of a discussion between House Rep. Lucas and House Rep. Boehlert discuss the issue of regulating hybrid vehicles. Rep. Lucas without further elaboration states, "My hope is that such hybrid vehicles would not have to be regulated under two separate regimes." See Hughes & Rosenberg, *supra* note 20, at 32.

World War II, the DUKW, (pronounced as "duck"). It is an amphibious vehicle.[135] These vehicles are capable of navigating on land and in water and were created to transport military supplies and personnel to land from the Normandy coast during World War II.[136] Surplus DUKWs were later sold to private sector companies to be used for commercial tourism.[137] Like commercial space vehicles, these amphibious vehicles were originally used for government purposes by the government sector and now are being used by the private sector specifically as a tourist vehicle.[138]

In one case, the state of Missouri treats these amphibious vehicles as a "vessel, not a motor vehicle" with minor exceptions pertaining to licensing. "A 'motorized amphibious vehicle' is a self-propelled vehicle designed or used for transporting property or eight or more persons on the highways and waters of this state."[139] The state of Missouri requires that the operator of the vehicle comply with highway regulations and obtain a motor vehicle license when operating on the highways.[140]At the same time, the vehicle is also subject to United States Coast Guard requirements when operating in state waters.[141]

The National Transportation Safety Board (NTSB) conducted an investigation when one of these amphibious vehicles sunk in Arkansas while providing a Duck Boat Tour,[142] As a result of its investigation, the NTSB made a recommendation regarding increasing safety for these types of "vehicles." The NTSB concluded that the amphibious vehicle was certified as a "small passenger vessel" and complied with all Federal regulations pursuant to 46 CFR Parts 175-185 (Subchapter T).[143]

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[135] National Transportation Safety Board (NTSB), *Safety Recommendation* (May 2, 2002), http://www.ntsb.gov/recs/letters/2002/M02_1_3_NY.pdf.

[136] *Id.*

[137] *Id.*

[138] *Id.*

[139] Mo. Ann. Stat. § 306.075 (West 2007).

[140] *Id.*

[141] *Id.*

[142] *See* NTSB, *supra* note 135. The *Miss Majestic* sunk in less than 30 seconds causing the deaths of 11 people. A canopy over the amphibious vehicle prevented vertical escape.

[143] *Id.*

The NTSB recommendation and the regulations of other states for amphibious vehicle emphasize the maximum capability of a vehicle to determine its category classification. It seems more reasonable to legally regard an amphibious vehicle as a "vessel" because its maximum capability is designed for the water. If an operator or passenger of the vehicle did not need the "vehicle" for its water capabilities, then it would rely on a vehicle designed solely for land. Thus, where a sub-orbital vehicle has the potential to function in a dual capacity, one way of categorizing the vehicle would be to focus on its maximum capability.

III. CONSIDERATIONS

A. Potential Conflict of Interest: Safety and Promotion

One authoritative view holds that the Department of Commerce should have the exclusive role of promoting the economics of the space industry. It is already a part of their role.[144] One aspect of determining why the Department of Commerce should promote the industry is because space tourism is a form of commerce. The very language used to describe the topic at hand is "commercial space transportation." Commercial is defined as a "connection with commerce or an activity that is carried on for profit."[145] The term "commercial" is used to describe an industry that intends to profit by providing a "commercial" advantage. The current focus of the commercial space transportation industry is on low Earth orbit which is referred to as "rapidly becoming a space enterprise zone."[146]

Moreover, the U.S. Space Transportation policy[147] specifically states, the "U.S. Government must capitalize on the entre-

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[144] USGAO, *Commercial Space Launches: FAA Needs Continued Planning and Monitoring to Oversee the Safety of the Emerging Space Tourism Industry*, GAO-07-16, 32 (October 2006).

[145] Lisa J. Savitt, Angeline G. Chen, Michael J. Francesconi, *Aviation and Aerospace: Law and Policy Developments*, 36 INT'L LAW. 507 (2002)

[146] Weeber, et al., *supra* note 58, at 4.

[147] U.S. Space Transportation Policy, Jan. 6, 2005, http://www.ostp.gov/html/SpaceTransFactSheetJan2005.pdf (last visited Dec. 3, 2007).

preneurial spirit of the U.S. private sector"[148] because any such improvements made by the private sector would enhance the opportunities to use space for *commercial* purposes. Moreover, under section IV titled Commercial Space Transportation, the policy states that the "U.S. gov't encourages and facilitates a viable U.S. *commercial* space transportation industry that, amongst other things, benefits the U.S. economy."[149]

Thus, it seems more appropriate for the Department of Commerce rather than the FAA to freely promote the space tourism industry by focusing on the primary objective of generating economic revenue without the restriction of a conflicting interest.

A recent report drafted by the U.S. Government Accountability Office (GAO) stated that the potential conflict that will be addressed, if necessary, based on a Department of Transportation report due in 2008.[150] The U.S. GAO report however addresses the fact that in both aviation and maritime law the promotional and regulating authority vested in one entity was later withdrawn due to a conflict of interest.[151] In the case of maritime law, the original authoritative entity was dissolved and the promotional authority was granted to the Department of Commerce.[152] For purposes of developing space tourism, precedent indicates that a conflict of interest is more than a potential issue. In fact, a conflict of interest seems inevitable.

B. International Regime: Bilateral Agreements in Lieu of International Treaties?

Establishing an international standard may be more efficient because it would diminish the potential problems that would need to be addressed in a conflict of laws situation. For example, one U.S. regulation requirement regarding the scope of disclosure required mandates informing an SFP that he or she may request additional information about an accident that

[148] *Id.*
[149] *Id.*
[150] USGAO, *supra* note 144.
[151] *Id.*
[152] *Id.*

has occurred.[153] However, this same type of disclosure could potentially be restricted by the International Traffic in Arms Regulations (ITAR).[154] The problem lies in the level of disclosure; the FAA requires an operator to inform an SFP by describing each "accident and human space flight incident at the system level" while ITAR would prohibit this information to a foreign national.[155] The implications of this requirement could prevent companies from being hired by a foreign SFP because ITAR would prohibit the disclosure of information that any other SFP would be entitled to. The FAA has agreed to require a "general systems description" which is consistent with ITAR requirements resolving this potential problem.[156] Despite this agreement, the discussion raises the issue of how U.S. national law can interfere with the global expansion of the industry.

The establishment of an international standard may help shape and promote a collaborative global development. Export controls may inhibit this collaborative effort because such controls restrict the opportunity to freely trade space related commodities. A push for setting international standards may provide a means of intensifying international collaboration.

There is already a growing trend toward establishing international uniformity with respect to financing and security which is being considered for application to space tourism. The International Institute for the Unification of Private Law (UNIDROIT), an intergovernmental organization, has established a committee of governmental experts alongside other private entities, such as Space Working Group, to establish commercial space financing standards for space assets.[157]

In proposing that an international agency is inevitably responsible for formulating the regulatory regime necessary to support the space tourism industry; it is essential to examine exactly who the regulations are trying to protect. If aviation

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[153] 14 C.F.R. §§ 460.45(e) - 45(f) (2006).

[154] *Id.*

[155] *Id.*

[156] *Id.*

[157] Martin Stanford, *Legal Issues in Space Tourism: Financing and Security Issues*, *in* ECSL PRACTITIONERS FORUM, SPACE TOURISM-LEGAL AND POLICY ASPECTS (Paris, Mar. 17, 2006).

law is a model, and it has been suggested that an organization as the International Civil Aviation Organization (ICAO) should be looked to as a suggested model,[158] the context in which that organization was established must be understood. In aviation, the international organization was a result of numerous accidents raising the issue of unlimited liability and astronomical insurance premiums.[159]

Bilateral agreements may provide increased cooperation and foster a greater incentive for compliance. Multi-national treaties allow too much room for diffusion of responsibility. Moreover, fines imposed for non-compliance may not be a consequence effective enough to foster compliance. This proposition has been suggested as a more effective way of carrying out FAA regulations.[160] In this regard the terms set forth in a bilateral agreement offer a more level playing field[161] and foster an environment for freedom of contract.

C. Safety Management System: Outcome Based Approach

Since one of the biggest debates rests on the conflicting dualism between the FAA's role in both promoting and regulating the industry, one suggested resolution is to let the industry regulate itself both in the promotion and regulation of the industry. [162] In fact, many members of the industry have already formed an organization, known as the Personal Spaceflight Federation (hereinafter, the Federation).[163] A predominant goal of the Federation is to rely on a self-policing form of governance rather than by an outside organization.[164]

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[158] *Id.*

[159] Charity Trelease Ryabinkin, *Let There Be Flight: It's Time to Reform the Regulation of Commercial Space Travel,* 69 J. AIR L. & COM. 101, 104 (2004).

[160] Mark Lee Morrison, Note, *Navigating the Tumultuous Skies of International Aviation: The Federal Aviation Administration's Response to Non-Compliance with International Safety Standards,* 2 SW. J.L. & TRADE AM. 621, 634 (1995).

[161] *Id.*

[162] Parsons, *supra* note 31, at 519.

[163] *Id.* at 520.

[164] *Id.*

Self-regulation is not far from a growing trend toward the emergence of global administrative law. [165] One type suggested by scholars addressing this trend is for a private entity to have regulatory functions.[166] One example of this model is the International Standardization Organization (ISO) which has set over 13,000 standards for products worldwide.[167] One counter argument however, is the adventurous nature of space tourists is not likely to deter future adventurers.[168]

Arguably, there is a greater amount of pressure on industry leaders to design the safest vehicle possible because any accidents or catastrophes would be self-destructive to the industry by reducing tourist confidence.[169] The space tourism companies' funding is greatly fueled by the individuals who want to participate. Over seven thousand people have signed up for a ticket[170] on Virgin Galactic, Mr. Richard Branson's space vehicle that will provide a tourist with a three and a half hour trip to outer space.[171] This type of self-regulation would encourage industry leaders to not only take safety precautions, but to strive for the most optimum safety standards.[172] The alternative to allowing the FAA to set standards now, is that it may not exert enough pressure necessary for achieving the greatest safety possible because it may foster a bare-minimum approach.[173] By allowing the industry to self-regulate, a greater threshold of safety may be achieved.

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[165] *See* Benedict Kingsbury, Nico Krisch & Richard B. Stewart, *The Emergence of Global Administrative Law*, 68 LAW & CONTEMP. PROBS. 15 (2005). Scholars address five types of "global administration" including administration by private institutions that possess regulatory functions and a hybrid comprised of both government and private participants.

[166] Kingsbury et al., *supra* note 165, at 22.

[167] *Id.*

[168] *Id.*

[169] *See* Britt, *supra* note 96, at 10.

[170] Tickets are currently priced at $200,000. Virgin Galactic Frequently Asked Questions, http://www.virgingalactic.com/htmlsite/faq.php?subtitle=Space%20Ticket&src=25 (last visited Dec. 3, 2007).

[171] Steven Freeland, *Up, Up and …Back: The Emergence of Space Tourism and Its Impact on the International Law of Outer Space,* 6 CHI. J. INT'L L. 1 (2005).

[172] Parsons, *supra* note 31, at 522.

[173] *Id.*

One alternative to self-regulation is a hybrid arrangement. The "hybrid intergovernmental-private arrangement" is comprised of "both government and private actors."[174] This arrangement may be the most beneficial model because it offers the industry a chance to grow while still balancing a need for public safety. By establishing a hybrid entity comprised of both government and private industry leaders; this dynamic should foster the ability to satisfy a greater constituency.

One proposed idea for a hybrid arrangement was made by Mr. Rutan.[175] Mr. Rutan suggested that spaceship safety should be a result of negotiations between the government and the industry developer.[176] The problem with the government being the sole regulating entity is that they do not know how to regulate spacecraft because they do not know what type of spacecraft will exist yet.[177] The developer should define the testing needed to demonstrate the safety of the spaceship's system.[178] After defining the test plan and negotiating with the FAA, it would be at the discretion of the FAA to then approve whether the developer met the safety test.[179] This hybrid arrangement fosters an approach to safety system regulation because it allows the industry developer to determine the means to achieving a particular outcome while the government proscribes the outcome.

Initially it seems that this type of outcome based regulation gives the industry developer too much discretion that may result in cost cutting, thereby compromising safety. Moreover, if too much discretion is left to the developer, then the developer might set standards that are minimal for the industry to achieve.

On the contrary, it would actually be self-destructive for the industry to compromise its safety system for the sake of saving money because the industry's goal is to build a space tourism

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[174] Kingsbury et al., *supra* note 165, at 20.

[175] Interview by Ted Balaker with Burt Rutan, Space Entrepreneur, Scaled Composites (Apr. 2005), *available at* http:www.reason.org/apr2005/space_travel.pdf. (last visited Dec. 3, 2007).

[176] *Id.*

[177] *Id.*

[178] *Id.*

[179] *Id.*

market.[180] The market will grow once the flight costs decrease and the flight costs will only decrease as consumer interest increases. Failure to provide safe flights will likely decrease consumer confidence. Mr. Rutan stated that its company policy on safety is to always question the safety of the vehicle rather than defend it so as to ensure the product is being built to its safest capacity.[181] Naturally it is in the best interest of the industry developers to make safety their primary goal.

IV. CONCLUSION

Examining the regulatory regime of sub-orbital flights reveals a variety of issues and considerations that exist at the interface between between air and space law. These issues and considerations are dynamic and can be expected to evolve as experience grows.

If the FAA continues regulating the space tourism industry, its focus should shift to the regulation of those who are at greater risk, namely the space flight participants and crew. It is because the doctrine of informed consent is so complex that more safety regulation instead of less should be afforded to the space flight participant.

Since a space flight participant aboard a suborbital flight may be analogized to a tourist aboard a cruise ship, maritime law may also provide an analogue that offers relevant precedents for suborbital flights – especially with regard to jurisdictional issues. This is not to say that maritime analogs should be chosen over aviation analogs, but rather they should be considered in the development of space law, at least, to the same extent that aviation law is regarded.

The international arena should be considered in the development of U.S. national space law, with respect to attracting foreign markets to U.S. space tourism companies. In regards to international regulation, bilateral agreements may prove to be more effective than international treaties because it increases the level of accountability and compliance from the parties that

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[180] *Id.*
[181] *Id.*

are in agreement. In addition, it fosters a universally accepted theme of freedom of contract which is essential to the innovative nascent of this industry.

Finally, a hybrid entity comprised of both governmental and private actors may be the entity most capable of addressing these issues of first impression. An outcome based approach to safety system regulation may help to reconcile the competing interests raised by the private ventures of the commercial space transportation industry.

A STUDY OF AEROSPACE LEGISLATION OF CHINA

Qi Yongliang[*]

In the past several decades, China has been continuously strengthening and improving its law system. On March 15, 2007, the third session of the ninth National People's Congress (NPC) passed "the Legislation Law" marking the beginning of a more improved and more matured period of China's legislation. In recent years China's space activities have developed rapidly and made astonishing achievements. On October 15, 2003, the manned Shenzhou-5 (SZ-5) was launched successfully, turning into reality a thousand-year old Chinese dream to fly into space. In 2007, China will launch the "Chang'e 1 exploration satellite to realize the dream of Chang'e to fly to the moon. In the course of its development, China's space technology needs the protection of laws, and further study of aerospace legislation laws.

I. THE MANAGEMENT SYSTEM OF THE AEROSPACE ACTIVITIES OF CHINA

The management of the China's space activities relies mainly on the country's relevant policies, the State Council's resolutions and orders, and a large amount of internal managerial regulations of the departments in charge of aviation. The former Ministry of Astronautics Industry had over 300 regulations for internal management. They are mainly the regulations for management of various areas, such as planning, technology, quality, security and finance. In 1998, the State Council established a new Commission of Science Technology and Industry for National Defense (COSTIND) (China National Space Administration (CNSA)) as the top organization of China's aviation industry. COSTIND has at different times made regula-

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tions such as "the Method for Managing Space Objects Registration", and "the Method for Managing Temporary License of Civil Space Launch Projects". Until now, The NPC and the State Council have not laid down any specific laws, nor rules on the management of space activities. This is not comparable to our needs to develop space activities at high speed.

II. CHINA NEEDS AEROSPACE LEGISLATION

China's aerospace legislation has long been emphasized by the State overseeing authorities and experts in the fields. In 1986, to accelerate the development of the aviation industry, the Ministry of Aerospace Industry submitted its seventh five-year legislation plan to the State Council, suggesting making provisions on vitalizing aviation industry.

In 1993, on the eighth NPC, the Shanghai delegation signed unanimously and submitted to the Congress a bill for legislating China's aerospace law. In the bill, it was pointed out that China's aerospace technology develops rapidly, and has entered an international market of launching service. In order to solve the new problems encountered in developing aerospace technology in the new situation, the bill suggests that China develop its aerospace law as early as possible.

In 1996 and again in 1997, Professor Qizhi He, the well known Chinese space law expert and a legal consultant of the Department of Foreign Affairs, wrote letters to the Administrator of the CNSA suggesting China make aerospace law as soon as possible to regulate the management of domestic companies engaging in aerospace activities.

In 1997, on the 15th National Chinese Communist Party's Congress (NCCPC), the president of China Academy of Aerospace Technology Research proposed that China should develop aerospace law so as to safeguard outer space resources and maintain the country's interests; to protect aviation properties and promote the development of space enterprise; and to protect the talented people in aviation industry and guarantee there are successors.

On November 17, 1998, at COSTIND legislation strategy symposium, Enjie Luan, the Vice Minister of COSTIND and the

Administrator of CNSA, emphasized the urgency and necessity of a State aerospace legislation. He hoped to enact China's aerospace law as early as possible.

On the fifth session of the tenth NPC in March 2007, through seminars, private consultations and research, many a NPC representatives drafted the "Proposal on Speeding up the Legislation of China's Aerospace Activities", suggesting a speed-up in China's aerospace legislation.

From the managerial point of view for aerospace activities, the Chinese economic system has transformed from a planned economy to a socialist market economy. It is no longer adequate for China to rely solely on the regulations and the management of the government's administrative means in carrying out certain important aerospace activities. In order to smooth the management relations and improve the development of aerospace activities, China needs the regulation of a State's law.

China has acceded to four international aerospace treaties passed by the United Nations' General Assembly and has taken international responsibilities and duties accordingly. The related provisions of these international treaties should be reflected in China's laws so that government organizations, legal persons and natural persons who are engaged in aerospace activities can understand and obey these regulations.

From the point of view of aerospace legislation, whether comparing China's aerospace legislation to that of the major countries in the world, or comparing China's aerospace legislation to the development of China's aerospace technology, China needs to bring about the aerospace legislation as early as possible.

III. RESEARCH ON CHINA'S AEROSPACE LEGISLATION

The organizations in charge of aerospace legislation in China and the related institutions, as well as the experts, have carried out beneficial investigations in China's aerospace legislation, and have taken on research work in various areas.

1. The Aerospace Corporation Has Set Up an Investigative Group for Aerospace Law Legislation In 1993, on the eighth NCP, the Shanghai Delegation submitted a pro-

posal to legislate the aerospace law. When the Ministry of Aviation and Aerospace (CNSA) was preparing the bill, an investigative group for the aerospace law legislation was established. They consulted the Shanghai NPC standing committee for specific comments on aerospace legislation, collected and translated aerospace laws of U.S., Russia, Ukraine and others. They consulted the NPC's Commission of Law Enforcement and the Bureau of Laws and Regulations of the State Council for opinions on legislating a State aerospace law. They also carried out research on the framework of aerospace law and at the same time conducted a research study on "The Aerospace Law Legislation of China".

2. In 1998, after the new COSTIND was established, it became the organization in charge of the State aerospace activities. COSTIND laid a great importance on the study of the aerospace legislation. Every year there were research studies related to issues of aerospace legislation. Among the studies, two important research projects were accomplished by entrusted institutions. In 2001, "A Study on the Legislation Structure of China's Aerospace Law" was finished. The study laid out the framework for China's aerospace legislation system and also the substance for its composing parts. In 2003, "A Comparative Study on Aerospace Laws of World Powers" was finished. Through this comparative study, suggestions for China's aerospace legislation were made as reference. Included were the major contents of China's aerospace law and the acceleration of the legislation. The accomplishment of these two important projects has laid a good foundation for State aerospace legislation.

3. Begin the Study of "The People's Republic of China Management Regulations of Aerospace Activities". In recent years, on top of its regular work and its related research tasks, COSTIND started studies on "The P. R. C. Management Regulations of Aerospace Activities". It focuses on the provisions that should be included in the management regulations of the aerospace activities.

IV. AN OUTLOOK ON CHINA'S AEROSPACE LEGISLATION

1. China Has the Conditions Necessary for Aerospace Legislation.

In addition to the need for aerospace activities management, our country's aerospace legislation has a relatively a good foundation in terms of technical conditions in aerospace legislation.

a. China's aerospace activities have taken place on a considerable scale. The development of its aerospace science and technology maintain a high speed and stability. After decades of hard work, Chinese aerospace activities have made remarkable achievements in the world and are of considerable scale. There are a large number of internal managerial regulations and rules, which put down a good foundation for China's aerospace legislation.

b. The international treaties joined by China, and the bilateral and multilateral agreements on aerospace activities signed by the Chinese government with many countries regulate the rights and responsibilities in carrying out space activities. They also provide some important contents for the legislation of China's aerospace activities.

c. China's experience in aerospace legislation and years of research studies on aerospace legislation, especially the study organized by COSTIND in recent years, have created a favorable condition for its aerospace legislation.

2. Establishing a System in China Aerospace Legislation

According to China's legislation rules and regulations, the Chinese aerospace law system should take a comprehensive aerospace law as its basis, supplemented with other related laws, administrative rules and institutional regulations to form a more complete aerospace law system. According to differentiated administrative duties and needs of the State, government and responsible institutions, corresponding laws, administrative rules or regulations should be made respectively. Currently,

China should continuously modify, enrich and improve the making of the regulations. At the same time, China should be actively engaged in the making of administrative rules and the study of legislating the aerospace law.

3. The Management Regulations of Aerospace Activities Are in Hope to Come Out Early.

In both procedure and the degree of difficulty, making administrative rules is much faster than legislating a set of laws. We are still in the period of reform, and a considerable amount of laws pertaining to the country's policies and its people's lives need legislation or modification urgently. If putting aerospace legislation on the NPC legislation agenda requires a long period of time, then making administrative rules and regulations first will be the faster alternative. Thus, we will not only fill in a blank in China's legislation, but will also lay down a foundation for legislating the aerospace law. COSTIND is working on "The People's Republic of China Aerospace Activities Regulations". It will soon come into being.

4. Legislating China's Aerospace Law is the Developing Trend.

The rapid development of China's space technology and the daily improvement of China's legal system will certainly bring forward the development of China's aerospace legislation. On basis of the existing administrative regulations and established administrative rules regarding aerospace activities, plus the achievements of many years of studies in aerospace legislation, an aerospace law of China is no longer a distant dream but a reality in the near future.

CASE NOTE

CORPORATE-SOVEREIGN SYMBIOSIS: *WILSON v. IMAGESAT INTERNATIONAL*, SHAREHOLDERS' ACTIONS, AND THE DUALISTIC NATURE OF STATE-OWNED CORPORATIONS

Jason A. Crook[*]

INTRODUCTION

It has long been established in corporate law that directors owe a duty of loyalty to an entity's shareholders[1] and that a corporation must honor the terms of its authorized commitments.[2] It is also well-recognized that a Nation-State may, in certain situations, exert influence over what and to whom an entity may sell.[3] It is considerably less common, however, to discover a case in which all three of these principles converge.

In the case of *Wilson v. ImageSat International N.V.*,[4] a dispute currently pending in the United States District Court for the Southern District of New York, the plaintiffs—minority shareholders and holders of ImageSat stock options—allege a variety of grievances against the company, its principal

[1] *See* Williams v. 5300 Columbia Pike Corp., 891 F. Supp. 1169, 1183 n.30 (E.D. Va. 1995).

[2] *See* Genesco Entertainment v. Koch, 593 F. Supp. 743, 748 (S.D.N.Y. 1984).

[3] *See* United States v. Bozarov, 974 F.2d 1037, 1038 (9th Cir. 1992).

[4] 2007cv6176 (S.D.N.Y. 2007).

shareholders, and several other affiliated individuals. While the case will likely be without resolution for some time, the complaint highlights a number of issues relevant to corporations in general, and to those engaged in the development and sale of militarily-sensitive technology in particular. Many of these issues invoke well-established principles of corporate law that need no further discussion, but the case does raise some novel and important questions. What are the fiduciary responsibilities of a State-owned entity? Can a State-owned firm ever be immune from suit? When a Nation-State seeks to further its political objectives through a corporate form, to what extent can it incur liability? Given the proliferation of State-supported entities in the technology and defense industries, these questions merit discussion.

IMAGESAT INTERNATIONAL AT A GLANCE

The purpose of ImageSat International according to its mission statement is to provide its customers in the national security sector with "the benefits of a domestic, high-resolution imaging capability, including complete autonomy, exclusivity, and confidentiality, while minimizing the cost and risk associated with the development of a national space imaging program."[5] Said another way, ImageSat seeks to provide its clients with "high-resolution imaging services from [ImageSat's] satellites, as if they are operating their own national sensors."[6] For a fee, a nation's civilian or military program can acquire the use of two highly-sophisticated reconnaissance satellites which ordinarily would have been beyond their ability to develop or employ.[7]

Putting this business model into practice, ImageSat's main method of generating revenue comes from entering into Satellite Operating Partner (SOP) agreements with its government cli-

[5] ImageSat International Mission, http://imagesatintl.com/default.asp?catid={471BB0D0-DD1C-4BD8-A609-C2A23A7DC251} (last visited Oct. 13, 2007).

[6] ImageSat International History, http://imagesatintl.com/default.asp?catid={F4E1341A-1E2C-4684-BDB1-291FC83F557C} (last visited Oct. 13, 2007).

[7] ImageSat International SOP Program, http://imagesatintl.com/default.asp?catid={C430687B-FB8B-4CCC-B3B9-EDC528B0D044} (last visited Oct. 13, 2007).

ents.[8] ImageSat trains and equips the employees of its client States to operate ImageSat's satellites, and whenever one of them passes over that client's respective portion of the globe, local ground operators exercise exclusive and autonomous control over what it views.[9] Because of its internationally-focused business system, ImageSat does not monitor or report what its clients see, and no SOP can preempt the operations of another.[10] Exclusivity, autonomy, secrecy, and flexibility are premium services ImageSat proudly offers.[11]

THE HISTORY AND ORGANIZATIONAL STRUCTURE OF IMAGESAT

Before delving into the intricacies presented in *Wilson v. ImageSat International N.V.*, a review of the history of the firm and the relationship it maintains with its principal shareholders is in order.[12] Following the collapse of the former Soviet Union and the global proliferation of military satellite technology in the early 1990s, the United States Congress authorized the commercialization of high-resolution satellite imaging in hopes of creating a market based upon the technology's civilian applications.[13] While this was unfolding, Israel launched *Ofeq 3*, a high-resolution reconnaissance satellite designed to deliver state-of-the-art real-time imagery.[14]

In May of 1994, Stephen Wilson—the lead plaintiff in the case—proposed to Israel Aircraft Industries (later Israel Aerospace Industries, or IAI) the creation of a new company that would compete in the recently-developed civilian satellite market.[15] IAI, a corporation owned entirely by the Israeli govern-

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[8] According to the plaintiffs' complaint, over 90% of the company's revenue has been generated through the SOP program. Wilson v. ImageSat International N.V., Complaint, ¶ 58 (July 2, 2007) [hereinafter Complaint].

[9] *See supra* note 7.

[10] *Id.*

[11] *Id.*

[12] This information comes largely from the complaint filed on July 2, 2007 in the U.S. District Court for the Southern District of New York. As such, it may contain inaccuracies which cannot be independently discovered.

[13] *See* Land Remote Sensing Policy Act of 1992, 15 U.S.C. § 5601 (1992).

[14] *See supra* note 6.

[15] Complaint, *supra* note 8, at ¶ 58. IAI was one of the chief developers of the Ofeq satellite program. *Id.* at ¶ 61.

ment,[16] and Core Software Technology, a U.S.-based firm, joined forces to establish the entity that would one day become ImageSat.[17] Under the terms of ImageSat's formation, neither of the originating firms nor their successors could ever own more than 50% of the company, or it would be subject to the regulatory regimes of the United States and Israel.[18] Given the type of service the company sought to offer, it was essential that it be "multinational rather than centered in any one country, but explicitly not in the United States or Israel" because of the perception that affiliating with either country would harm the company's ability to offer autonomous, confidential, and exclusive satellite access.[19] After incorporating in the Cayman Islands as West Indian Space in 1997, the company relocated its corporate domicile to the Netherlands Antilles in June of 2000, adopting the current name of ImageSat International N.V.[20]

In response to the demands of Elbit Systems Ltd. (formerly known as ElOP), a privately held Israeli defense company which manufactured the *Ofeq* satellites' electro-optical imaging payload, the Israel Ministry of Defense (IMOD) directed IAI to share its 50% ownership stake such that it was left controlling 37.5% of ImageSat's stock while ElOP gained a 12.5% interest in the company.[21] As consideration for their shares, "ElOP agreed to grant to ImageSat the exclusive rights to commercialize its contributions to the collective '*Ofeq* satellite technology,' and not to compete with ImageSat in the exploitation of its satellite earth observation technology…."[22] This exclusivity arrangement was "precisely [the same] as IAI had done through the initial joint venture agreements in 1994 and 1995."[23] Soon

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[16] *Id.* at ¶ 40.

[17] *Id.* at ¶ 60.

[18] *Id.* at ¶¶ 59-60.

[19] *See supra* note 17.

[20] Complaint, *supra* note 8, at ¶ 56. "N.V." or "Naamloze Vennootschap" refers to the entity's designation as a public limited liability company under the laws of the Netherlands Antilles. *Id.* Although the company maintains an office on the Netherlands Antilles island of Curacao, its principal place of business is in Israel. *Id.* at ¶ 39.

[21] *Id.* at ¶ 61.

[22] *Id.*

[23] *Id*.

after, Core Software Technology also sold off a portion of its interest to a group of private investors.[24]

To finance the company's day-to-day operations and particularly the costs associated with the launch of its first satellite, *EROS A*, ImageSat's executive team focused heavily on obtaining private investment.[25] As an inducement to investors, the complaint alleges that "[f]rom the outset, it was understood and agreed that ImageSat would be an apolitical, commercial enterprise"[26] and that beyond "certain narrowly defined limitations by the IMOD (in its role as the export control authority for classified Israeli technology used by the company) ImageSat's business decision-making, including the selection of the customers (countries) with which [it] would do business, was to be completely apolitical."[27] ImageSat thus began operation with a unique ownership structure comprised of both private and State-supported entities.

WILSON V. IMAGESAT INTERNATIONAL N.V.

The veracity of the allegations against ImageSat and its co-defendants has yet to be proven in court. Nonetheless, the charges raised in the complaint implicate several bedrock principles of corporate law and, in some instances, raise unique twists on their historic doctrines. Many of these issues—such as breach of contract, shareholder rights, and corporate responsibility—have been litigated for decades if not centuries, so a review of them here is unlikely to shed new light on any matter of substance. However, the actions taken by a State-owned company to the detriment of other shareholders, and the fiduciary relationship owed therein, present an unusual dynamic in an otherwise routine complaint.

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[24] *Id.* at ¶ 62. After the stock transfers, ImageSat's ownership composition appeared as follows: IAI (37.5%); Elbit Systems (12.5%); Core Software Technology (31.25%); private investors (18.75%).

[25] *Id*. at ¶ 79. This was accomplished through the use of "bridge warrants" which could later be converted into ImageSat common stock. *Id.* at ¶ 84. EROS (Earth Remote Observation Satellite) was the commercial version of Ofeq. *See supra* note 6.

[26] Complaint, *supra* note 8, at ¶ 63.

[27] *Id.*

A. The Origins of the Lawsuit

The plaintiffs in this case are minority shareholders of ImageSat International who, along with holders of ImageSat stock options and convertible bridge warrants, allege that:

> Instead of properly recognizing [their] rights [as] minority shareholders, [the] Defendants have deprived them of their voice in the operation of the Company and have engaged in a series of actions and transactions characterized by multiple breaches of fiduciary duty, self-dealing, and other willfully fraudulent, deceptive, and oppressive acts, the net effect of which . . . has been to strip hundreds of millions of dollars of shareholder value from ImageSat and to further and wrongfully dilute and devalue or destroy each of the Plaintiffs' ownership interests in the Company.[28]

Although the plaintiffs bring their lawsuit chiefly against ImageSat International, nineteen of their twenty-two claims for relief also involve allegations against another defendant—the State-owned IAI. Since the lawsuit against ImageSat raises few, if any, novel legal questions by itself while the action against the State-owned corporation IAI offers many more, the following analysis will be confined exclusively to discussing IAI's role in the case.

B. The Allegations Against IAI

The allegations against IAI are numerous and varied. Six of the claims allege breach of fiduciary duty; two allege liability for corporate waste; and the remainder raise allegations ranging from self-dealing to common-law fraud.[29] Two particular allegations to be discussed herein include IAI's alleged interference with ImageSat's negotiations with the Government of Venezuela, and also its alleged campaign to diminish ImageSat's international operations through targeted contract breaches.

Looking to the first claim of IAI's alleged interference with the Venezuelan negotiations, the plaintiffs seek damages of

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[28] *Id.* at ¶ 3.

[29] *Id*. at ¶¶ 194 -389.

$215 million on this particular count stemming from IAI's "[m]anipulat[ion of] ImageSat's SOP program to enhance the attractiveness of [its] own sales initiatives in Venezuela" and also its failure "to take advantage of the Venezuelan opportunity for reasons unrelated to the best interests of the Company and its shareholders."[30] These actions allegedly devalued the company by millions. In 1999, Stephen Wilson and two other plaintiffs acting on ImageSat's behalf began discussions with the Venezuelan government to see about obtaining a lucrative SOP contract.[31] Negotiations proved successful when Venezuela allocated funds for ImageSat's program in 2002.[32] The complaint alleges that shortly thereafter, "IAI's senior international marketing and sales team . . . informed the Venezuelan Air Force that ImageSat's SOP proposal was withdrawn and that instead, the *EROS* satellite program had been 'bundled' with a comprehensive and more expensive high-tech intelligence program proposed by IAI."[33] If true, this behavior would certainly support the "manipulation" allegation regarding the Venezuelan deal.

Looking to the second charge in this allegation, that IAI deliberately failed to take advantage of the Venezuelan opportunity for "reasons unrelated to the best interests of the Company and its shareholders," the geopolitical landscape at the time provides a likely reason for why this might have occurred. In 2002, the relationship between the United States and Venezuela was worsening and Israel had to decide where it stood in relation to these changes.[34] The plaintiffs allege that the deteriora-

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[30] *Id.* at ¶¶ 226-34.

[31] *Id.* at ¶ 134.

[32] *Id.* at ¶ 135.

[33] *Id.*

[34] "Protests in April 2002 led to a gun-battle in Caracas between government and opposition supporters and the deaths of more than a dozen people. In these circumstances military leaders refused to act on orders by Chavez to repress demonstrators and subsequently on the evening of April 11 asked the president to leave office. However a small right-wing group of military leaders then took control, closing the assembly. In these confused circumstances, the military high command then asked Chavez back to power late on April 13. . . . The coup was significant for two reasons. First, in the wake of the coup Mr. Chavez began to purge political opponents in the armed forces and gradually cemented his control over the institution. Second, the coup contributed to [the] deterioration in relations between the United States and Chavez."

tion in diplomatic relations between the United States and Venezuela caused Shimon Eckhaus, ImageSat's CEO and IAI's former Vice President for International Marketing and Sales—the same IAI division which had previously attempted to market its own satellite package to Venezuela—to declare that ImageSat would not proceed with the Venezuelan SOP opportunity.[35] The geopolitical events on record support this aspect of the plaintiff's allegation.[36]

While the initial manipulation and subsequent rejection of this business opportunity are alleged to have had an adverse effect on the plaintiffs, these are not the only accusations leveled against IAI.[37] Of particular interest is the case's second allegation concerning the destruction of ImageSat's international profile through its failure to honor several key contracts with customers such as Russia, Angola, and South Korea.[38] Although the allegation shares many similarities with the previously-mentioned Venezuelan opportunity, this accusation is decidedly different. Whereas the first claim accuses IAI and the other defendants of failing to pursue a business opportunity because of U.S.-Israeli policy concerns, this second claim goes even further by accusing them of using their combined ownership interests to essentially nationalize ImageSat.[39]

In support of this allegation, the plaintiffs argue that after the failed 2004 "launch of the IMOD's *Ofeq 6* satellite (a satellite by then urgently needed by the IMOD to replace the aging *Ofeq 5*) . . . [ImageSat's two working satellites] were suddenly recognized as priceless assets by the Israeli defense establishment."[40] The plaintiffs allege that IAI and Elbit—acting in con-

Richard Lapper, *Venezuela and the Rise of Chavez: A Background Discussion Paper* (Nov. 22, 2005), http://www.cfr.org/publication/9269/venezuela_and_the_rise_of_chavez.html (last visited Oct. 13, 2007).

[35] Complaint, *supra* note 8, at ¶¶ 46, 147. "Rather than the legitimate commercial interests of Plaintiffs and similarly situated minority shareholders, Defendants were motivated by the deteriorating international relationship between the United States and Venezuela and Israel's desire to improve and maintain its historically good relations with the United States." *Id.* at ¶ 149.

[36] Lapper, *supra* note 34.

[37] *See supra* note 29.

[38] Complaint, *supra* note 8, at ¶ 220.

[39] *Id.* at ¶ 17.

[40] *Id.* at ¶ 19.

cert for the benefit of the IMOD—"caus[ed] many of the Company's operations outside of Israel to be terminated…."[41] This decision allegedly manifested itself through the willful "default of a strategic . . . relationship with Sovinformsputnik, the exclusive licensee of the Russian Space Agency," through the failure "to deliver under the terms of its [agreement with] South Korea, another of the Company's prime SOP prospects," and also by "[w]illfully failing to deliver, over a four-year period . . . even a single day of autonomous SOP service to Angola…."[42] Viewed together, the plaintiffs allege that these actions have taken a "formerly dynamic and robustly international corporate profile [and] gradually but irreparably diminished [it] to that of a small and captive (though uniquely valuable) Israeli company based entirely in, and primarily serving constituencies in, Israel."[43]

C. Piercing the Corporate Veil

There is a well-established principle in corporate law known as the Business Judgment Rule which holds that "absent a showing of bad faith, self-dealing, or some other breach of fiduciary duty, a court normally may not reach the issue of whether an act of the Board is reasonable."[44] This doctrine is designed to keep directors from being sued every time the corporation makes a decision that does not pay off.[45] Courts recognize that with the benefit of hindsight any failed decision would likely be seen as unreasonably risky, yet in order to allow the business to take calculated risks which could produce socially-desirable returns, courts have limited themselves to evaluating whether the board's decision was "taken in good faith and in the exercise of honest judgment in the lawful and legitimate furtherance of corporate purposes . . ."[46]

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[41] *Id.* at ¶ 220. ImageSat's CEOs at the time of these actions had all previously been employed by IAI. *Id.* at ¶ 114.

[42] *Id.* at ¶ 220.

[43] *Id.* at ¶ 17.

[44] Braun v. 941 Park Ave., 816 N.Y.S.2d 58, 62 (N.Y. App. Div. 2006).

[45] *Id.*

[46] *Id.*

Related back to *Wilson v. ImageSat International*, the Business Judgment Rule could provide an airtight defense to IAI and the remaining co-defendants if they could prove that they exercised their powers "for the common and general interests of the corporation [even though] the results show that what they did was unwise or inexpedient."[47] However, a showing of bad faith or a breach of fiduciary duty through fraud, self-dealing, or unconscionability could negate this rule and allow the court to make further inquiry into their decision-making process.[48] To avoid this, IAI and its co-defendants could try to argue, for instance, that the decisions to withdraw from the Venezuelan opportunity or to scale back ImageSat's international operations were not made out of any bad-faith desire for unjust personal enrichment, but merely the result of prevailing global trends and the need to adapt accordingly. By using the Business Judgment Rule as a shield, IAI could escape liability for any damages ImageSat International might have suffered because it could argue that it sincerely believed—albeit erroneously—that the decisions it supported were in ImageSat's overall best interest. Any weight these arguments would be afforded, however, would rest upon a showing of whether or not they "breached their fiduciary obligation to the corporation" and the remaining shareholders.[49]

D. Defining Fiduciary Duty

"While noting the *existence* of fiduciary duties is an uncomplicated task, the same may not be said of defining precisely what is *proper conduct* in the context of a particular corporate transaction."[50] This observation by the New York Court of Appeals in *Alpert v. 28 Williams Street Corp.* eloquently applies to the allegations raised against IAI. With the complaint alleging

[47] Matter of Levandusky v. One Fifth Ave. Apt. Corp., 75 N.Y.2d 530, 537-38 (N.Y. 1990).

[48] Schoninger v. Yardarm Beach Homeowners Ass'n, Inc., 134 A.D.2d 1, 10 (N.Y. App. Div. 1987).

[49] Pelton v. 77 Park Ave. Condominium, 38 A.D.3d 1, 8 (N.Y. App. Div. 2006).

[50] Alpert v. 28 Williams Street Corp., 473 N.E.2d 19, 26 (N.Y. 1984) (italics emphasis added).

a total of over $3.5 billion of damages accrued over several years of supposed transactions and inactions,[51] it will undoubtedly take some time to determine the propriety of all of the decisions made by IAI and the implications arising from them. However, general principles of fiduciary duty have long been in existence, so it is possible to identify factors the Court will likely consider in rendering a decision. The plaintiffs have chosen to file in the Southern District of New York and assert that New York is the appropriate judicial forum for this case.[52] Therefore, as with the preceding section of this analysis, New York law will be cited herein.

Although IAI was never—and could never have become—a true majority shareholder under the terms of ImageSat's formation,[53] its collaborative relationship with Elbit Systems and many of the individuals named as co-defendants is alleged to have given it unparalleled practical dominion over the corporation's affairs.[54] Under such circumstances, minority status has been held to be insignificant in light of a shareholder's virtually unfettered control and jurisdictions have agreed that the question of minority versus majority should not focus on mathematical calculations, but instead upon whether they have the power to work their will on others and whether they have done so improperly.[55] Therefore, in the instant case an analysis regarding abuse by a majority shareholder can be applied to IAI, a technical minority, but practically dominant, shareholder.

In light of the position of control IAI is accused of occupying, New York law is instructive about how courts will likely

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[51] Complaint, *supra* note 8, at pp. 148-51.

[52] *Id.* at ¶ 73. ImageSat's board allegedly held regular meetings in New York to consider policy changes. *Id.*

[53] *Id.* at ¶ 59.

[54] Though not arising under New York law, *Hollis v. Hill*, 232 F.3d 460, 466 n.16 (5th Cir. 2000) is particularly instructive on this point:

While we acknowledge that in *Clark* the plaintiff truly was a "minority" shareholder, in the sense that he owned only 1/5 of the stock, we find this difference insignificant in light of Hill's virtually unfettered control of FFUSA. Further, [. . .] other jurisdictions have agreed that the question of minority versus majority should not focus on mechanical mathematical calculations, but instead, "The question is whether they have the power to work their will on others-and whether they have done so improperly."

[55] *Id.*

treat shareholders who are accused of abusing their power. In *Robinson v. New York, Westchester & Boston Railway Co.*, a merger case decided in 1908, the Court held that when an action of a controlling party "is so detrimental to the interests of the corporation itself as to lead to the necessary inference that the interests of [those] shareholders lie wholly outside of, and in opposition to, the interests of the corporation and of a minority of the shareholders," a court may intervene to prevent the "wanton or fraudulent destruction of the [aggrieved party's] rights . . . ."[56] Furthermore,

> because the power to manage the affairs of a corporation is vested in the directors and majority shareholders, they are cast in the fiduciary role of "guardians of the corporate welfare" [and in] this position of trust, they have an obligation to all shareholders to adhere to fiduciary standards of conduct and to exercise their responsibilities in good faith when undertaking any corporate action.[57]

Being a "guardian of the corporate welfare," as *Alpert* calls it, imposes "an overriding duty to provide good and prudent management, which demands that decisions be made for the welfare, advantage, and best interests of the corporation and the shareholders as a whole…."[58]

Relating this back to IAI, the recurring obligations of duty and good faith are important concepts in New York law and will likely figure prominently in deciding *Wilson v. ImageSat International N.V.* In *Higgins v. New York Stock Exchange*, the court ruled that one "component of a fiduciary's dut[y] to the corporation is that [the controlling parties] are obligated to exercise all of their responsibilities . . . in good faith."[59] Good faith is the "honest belief, the absence of malice and the absence of design to defraud or to seek an unconscionable advantage."[60] Bad faith,

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[56] Robinson v. New York, Westchester & Boston Ry. Co., 123 A.D. 339, 341 (N.Y. App. Div. 1908).

[57] Alpert v. 28 Williams Street Corp., 473 N.E.2d 19, 25 (N.Y. 1984).

[58] *Id.* at 28.

[59] 806 N.Y.S.2d 339, 361 (N.Y. Sup. Ct. 2005).

[60] Nicolleta v. Rochester Eye and Human Parts Bank, Inc., 519 N.Y.S.2d 928, 930 (N.Y. Sup. 1987).

conversely, "means [an] ulterior motive, for example, [such as] personal gain."[61] A showing of bad faith in its interactions with ImageSat would likely strip away IAI's protection afforded by the Business Judgment Rule.[62] Even if IAI is not found to have acted in bad faith, however, its legal challenges are far from over, since "[u]nder New York law, corporate fiduciaries may be held liable for breach of fiduciary duty even for conduct undertaken in good faith and innocent intent"[63] and "[i]t is well established that . . . good faith or innocent motives . . . [are] no defense to liabilities founded upon breaches of fiduciary obligations."[64]

E. The FSIA Effect

In light of the number of allegations leveled against IAI, it is possible that a court will find *some* violation of fiduciary duty or evidence of bad faith on its part. However, if IAI is deemed to be acting more like an instrumentality of the State of Israel instead of a regular corporation, the Foreign Sovereign Immunities Act of 1976 (FSIA)[65] holds that this may not be relevant. Passed "to give foreign states and their instrumentalities some protection from the inconvenience of suit as a gesture of comity between the United States and other sovereigns[,]" this act may restrict or even bar some of the litigation against IAI.[66]

FSIA provides in pertinent part that "a foreign state shall be immune from the jurisdiction of the courts of the United States" unless its conduct falls under one of the Act's exceptions. While these exceptions are too numerous to list here, they generally involve the waiver of immunity either by consent or though engaging in a commercial activity which causes a "direct effect" in the United States, or through the bringing of a counterclaim in an American court.[67] In *Dole Food Co. v. Patrickson*

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[61] P.J. Taggares Co. v. New York Mercantile Exchange, 476 F. Supp. 72, 77 (S.D.N.Y. 1979).

[62] *See supra* note 47.

[63] In re Happy Time Fashions, Inc., 7 B.R. 665, 670 (Bankr. S.D.N.Y. 1980).

[64] In re Hyman, 320 B.R. 493, 505 (Bankr. S.D.N.Y. 2005).

[65] 28 U.S.C. § 1602 (1976).

[66] Dole Food Co. v. Patrickson, 538 U.S. 468, 479 (2003).

[67] *See supra* note 65 at § 1604.

the Court ruled that "[s]ome of the Act's provisions also may be invoked by a corporate entity that is an 'instrumentality' of a foreign state as defined by the Act."[68] Under FSIA, an instrumentality of a foreign state is defined as an entity (1) which is a separate legal person, corporate or otherwise, and (2) which has a majority of its shares or ownership interest owned by a foreign state, and (3) is neither a citizen of a State of the United States nor was created under the laws of any third country.[69] The plaintiffs' complaint identifies IAI as a legal entity separately defined from the State of Israel having 100% of its shares owned by the Israeli government, and while it has an American subsidiary created under the laws of Delaware, by itself it is not a citizen of any American state or a creation under the laws of any "third country" (i.e. one other than the United States or Israel).[70]

In *Dole Food Co.*, the U.S. Supreme Court had to determine whether the *subsidiaries* of another State-owned Israeli company could qualify for legal immunity.[71] There, the Court ruled that "a foreign state must itself own a majority of the shares of a corporation if the corporation is to be deemed an instrumentality of the state [and possibly protected by immunity] under the provisions of FSIA…."[72] While this means that ImageSat will have no defense under a claim of sovereign immunity, the issue is less clear for IAI. Given that IAI is not a subsidiary of any other firm and appears to meet FSIA's requirements for being deemed an instrumentality of Israel, it seems at first to have protection under sovereign immunity. However, as with many issues the Supreme Court takes up, the doctrine announced in one case is rarely made in a judicial vacuum and often builds upon the rulings and factual histories of others. A clear illustration of this comes in the next case, *Republic of Argentina v. Weltover, Inc.*,[73]

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[68] *Dole Food Co.*, 538 U.S. at 471.
[69] *See* 28 U.S.C. § 1603(b).
[70] Complaint, *supra* note 8, at ¶ 40.
[71] *Dole Food Co.*, 538 U.S. at 476.
[72] *Id.* at 480.
[73] 504 U.S. 607 (1992).

In *Republic of Argentina v. Weltover, Inc.*, the Supreme Court addressed whether Argentina's issuance of bonds payable in New York City constituted enough of a "commercial" activity to warrant the loss of immunity under FSIA.[74] While recognizing that "jurisdiction may not be predicated on purely trivial effects in the United States,"[75] the Court ruled that:

> when a foreign government acts, not as regulator of a market, but in the manner of a private player within it, the foreign sovereign's actions are "commercial" within the meaning of the FSIA. Moreover, because the Act provides that the commercial character of an act is to be determined by reference to its "nature" rather than its "purpose," 28 U.S.C. § 1603(d), the question is not whether the foreign government is acting with a profit motive or instead with the aim of fulfilling uniquely sovereign objectives. Rather, the issue is whether the particular actions that the foreign state performs (whatever the motive behind them) are the *type* of actions by which a private party engages in "trade and traffic or commerce…."[76]

This creates a problem for defenses IAI might try to raise on the grounds of sovereign immunity, because, as the complaint alleges, its proposal to supply the Venezuelan government with its own package of satellite services would likely be seen by the Court as evidence of a "commercial" activity carried out by a "private player" in the global satellite market.[77] However, as the Court recognized in *Saudi Arabia v. Nelson*, there is great difficulty in "distinguishing 'purpose' (i.e. the *reason* why the foreign state engages in the activity) from 'nature' (i.e. the outward form of the conduct that the foreign state performs or agrees to perform[.]"[78] Thus, any effect this distinction might have on the remaining allegations against IAI is unclear, since the Court did not clarify the extent to which an otherwise political action—such as declaring sanctions against a regime such as Venezuela—could translate into a "commercial" activity undertaken

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[74] *Id.* at 607.
[75] *Id.* at 618.
[76] *Id.* at 614.
[77] *See supra* note 32.
[78] 507 U.S. 349, 361 (1993).

by an instrumentality—such as directing ImageSat to refuse to consummate a sale to Venezuela.

CONCLUSION

With the actions of so many parties under review and so much money potentially at stake, the case of *Wilson v. ImageSat International N.V.* promises to be interesting. At the heart of this dispute the question remains of what happens when an entity like IAI tries to have it both ways? That is, what are the legal repercussions when an entity acts like a corporation in some settings and as an extension of a Nation-State in others? Are they to be treated as a government instrumentality, a private institution, or some combination in between? This question adds an uncertain dimension to an otherwise routine shareholder action, because as the Supreme Court held in *Dole Food Co. v. Patrickson*, there are certain instances when a State-owned corporation will be held immune from suit, but as it also ruled in *Republic of Argentina v. Weltover, Inc.*, there are other instances when it will not. Compounding the uncertainty, *Saudi Arabia v. Nelson* freely admits that the distinction is a close one. General principles of corporate law suggest that IAI owes fiduciary duties to ImageSat and its other shareholders, but if seen as an instrumentality of the State, the effect of these duties is less clear. Since IAI is alleged to have committed or influenced the majority of the allegations raised in this lawsuit, how this distinction is resolved will have a powerful effect on the overall case.

COMMENTARY

NATIONAL SPACE LEGISLATION IN MAINLAND CHINA

Yun Zhao[*]

1. INTRODUCTION

China launched its first satellite (DFH-1) by Long March vehicle in 1970 and became full member of the United Nations Committee on Peaceful Uses of Outer Space (UNCOPUOS) ten years later. Due to historical reasons, China has so far concentrated on technological development in outer space; development of and research in space law has been lagging far behind. However, China has, on various occasions, acknowledged the importance of space law in the development of space exploration and has taken efforts to improve in this area. The UNCOPUOS membership has accelerated China's pace in space legislation. The Chinese Government ratified the Outer Space Treaty[1] in 1983 and the other three space treaties (except the Moon Agreement) in 1988.[2]

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[1] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, Jan. 27, 1967, 610 U.N.S.T. 205 (entered into force Oct. 10, 1967) [hereinafter the Outer Space Treaty]. China acceded to the Outer Space Treaty on December 30, 1983.

[2] Agreement on the Rescue of Astronauts, the Return of Astronauts, and the Return of Objects Launched into Outer Space, Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue Agreement]; Convention on International Liability for Damage

Efforts in developing national space legislation started around 1994; but most substantial work was carried out after 1998 when China reformed its administrative system for the industries. Currently, there are no national space laws in China. But several regulations have been implemented concerning registration and launching of space objects: the Provisions and Procedures for the Registration of Space Objects on February 8, 2001[3]; and the Interim Measures on the Administration of Permits for Civil Space Launch Projects on November 21, 2002[4]. China's ambitious plan to reach out to the Moon and other, less ambitious, space projects underscores the urgent need for national space legislation.

2. SPACE POLICY

China's space activities aim to explore outer space, and enhance understanding of the Earth and the cosmos; to utilize outer space for peaceful purposes, promote human civilization and social progress, and benefit the whole of mankind; to meet the demands of economic construction, scientific and technological development, national security and social progress; and to raise the scientific quality of the Chinese people, protect China's national interests and rights, and build up the comprehensive national strength.[5]

The principles to be followed for the development of China's space industry, as identified in the White Paper on China's Space Activities in 2006, are as follows: maintaining and serving the country's overall development strategy, and meeting the

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Caused by Space Objects, Mar. 29, 1972, 24 U.S.T 2389, T.I.A.S No. 7762 [hereinafter Liability Convention]; and the Convention on Registration of Objects Launched into Outer Space, Jan. 14 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention]. China acceded to the Rescue Agreement on December 14, 1988, the Liability Convention on December 12, 1988, and the Registration Convention on December 12, 1988.

[3] Order No. 6 of the Commission of Science, Technology, and Industry for National Defense of the People's Republic of China, February 8, 2001.

[4] Order No. 12 of the Commission of Science, Technology, and Industry for National Defense of the People's Republic of China, November 21, 2002.

[5] The State Council Information Office, China's Space Activities in 2006 (White Paper), Beijing, China (Oct. 2006), http://www.china.org.cn/english/features/book/183672.htm (hereinafter 2006 White Paper).

needs of the state and reflecting its will; upholding independence and self-reliance policy, making innovations independently and realizing leapfrogging development; maintaining comprehensive, coordinated and sustainable development, and bringing into full play the functions of space science and technology in promoting and sustaining the country's science and technology sector, as well as economic and social development; adhering to the policy of opening up to the outside world, and actively engaging in international space exchanges and cooperation.[6] The above aims and principles apply generally to national space legislation in China.

It is also to be noted that international cooperation is elaborated in a separate part in the White Paper in 2000, implying that China attaches great importance to space cooperation in various levels.[7] This principle has been further confirmed in the 2006 White Paper on China's Space Activities.[8] In this White Paper, China clarifies the following policies with regard to developing international space exchanges and cooperation: adhering to the principle of independence and taking the initiative in our own hands, carrying out active and practical international cooperation in consideration of the overall, rational utilization of domestic and international markets and resources to meet the needs of the national modernization drive; supporting activities regarding the peaceful use of outer space within the framework of the United Nations; attaching importance to space coopera-

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[6] *Id.*

[7] The State Council Information Office, China's Space Activities in 2000 (White Paper), Beijing, China (Nov. 2000). http://www.spaceref.com/china/china.white.paper.nov.22.2000.html. Guiding principles for international cooperation are: the aim of international space cooperation is to peacefully develop and use space resources for the benefit of all mankind; international space cooperation should be carried out on the basis of equality and mutual benefit, mutual complementarity and common development, and the generally accepted principles of international law; the priority aim of international space cooperation is to simultaneously increase the capability of space development of all countries, particularly the developing countries, and enable all countries to enjoy the benefits of space technology; necessary measures should be adopted to protect the space environment and space resources in the course of international space cooperation; the function of the United Nations Office of Outer Space Affairs (OOSA) should be consolidated and the outer space application programs of the United Nations should be backed up.

[8] 2006 White Paper, *supra* note 5.

tion in the Asia-Pacific region, and supporting other regional space cooperation around the world; reinforcing space cooperation with developing countries, and valuing space cooperation with developed countries; encouraging and endorsing the efforts of domestic scientific research institutes, industrial enterprises, institutions of higher learning, as well as social organizations to develop international space exchanges and cooperation in different forms and at different levels under the guidance of relevant state policies, laws and regulations.[9]

3. ORGANIZATION OF NATIONAL SPACE ACTIVITIES

China National Space Administration (CNSA) was established as a government institution to develop and fulfill China's due international obligations, with the approval by the 8th National People's Congress (NPC) of China. The 9th NPC assigned the CNSA as an internal structure of the Commission of Science, Technology and Industry for National Defense (COSTIND). The CNSA assumes the following main responsibilities: signing governmental agreements in the space area on behalf of organization, inter-governmental scientific and technical exchanges; and also being in charge of the enforcement of national space policies and managing the national space science, technology and industry.[10] Accordingly, the CNSA is the main administrative body in charge of national space industry and civil space activities; it is also the most important authority responsible for preparing space legislation, formulating policies for space industry and technology, making plans for space development and setting standards in these areas.[11]

There are four departments under the CNSA: Department of General Planning, Department of System Engineering, Department of Science, Technology and Quality Control, Department of Foreign Affairs. [12]

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[9] *Id.*

[10] China National Space Administration, http://www.cnsa.gov.cn (last visited Dec. 6, 2007).

[11] *Id.*

[12] *Id.*

4. CURRENT LEGAL FRAMEWORK FOR SPACE ACTIVITIES

4.1. Registration of Space Objects

The Provisions and Procedures for the Registration of Space Objects, published in 2001 by the COSTIND and the Ministry of Foreign Affairs (MFA), is the first domestic administrative regulation adopted by China on space activities. The main purpose of this regulation is to fulfill China's commitments under the Registration Convention, while taking into account the practical situation in China.

All the space objects launched within the territory of China, or launched abroad but with China as a co-launching State, shall be registered with the COSTIND within 60 days after the space objects were launched into orbit. The COSTIND should maintain the National Registration Booklet. Modification to the registration shall be done within 60 days after the change of the relevant circumstances, such as changes of orbit, disintegration, end of operation, or re-entry into atmosphere. The COSTIND shall provide to the MFA relevant registration data within 60 days after domestic registration; the MFA will then register with the United Nations Secretary-General. With regard to the special case of Hong Kong and Macao, a special Sub-Registration Booklet shall be established with the registration procedure to be stipulated separately.[13]

4.2. Licensing of Launch Services by Private Enterprises

The Interim Measures on the Administration of Permits for Civil Space Launch Projects, released by the COSTIND in 2002, established the licensing regime for all spacecraft launches within the territory of China, excluding launches for military purposes and the entry of such spacecrafts over which the natu-

[13] Xiaohong Liu & Xiaoqing Wang, *The First Administrative Regulation on Space Activities in China*, UNITED NATIONS/INTERNATIONAL INSTITUTE OF AIR AND SPACE LAW (IIASL) WORKSHOP ON CAPACITY BUILDING IN SPACE LAW (The Hague, Nov. 18-21, 2002). The registration procedure include open end; possibility of being amended after certain period of implementation; and possibility of being upgraded into administrative law or regulation in the future. *Id.*

ral persons, legal persons or other organization of China have had property or have property by means of on-orbit delivery into the outer space from outside of the territory of China.[14] The COSTIND is the authority responsible for examining, approving and supervising all civil space launch projects.[15]

The general project contractor should apply to the COSTIND with relevant documents nine months before the prearranged month for the launch of the project.[16] The COSTIND should organize the examination of the project within 30 days as of receipt of the application documents and notify in writing the applicant and the relevant departments of the decisions.[17] The permit should include the following: the name of the applicant and its legal representative, the registration address of the applicant's domicile, main contents of the project, the prearranged time for launch, validity period of the permit, the organ issuing the permit and the time of issuance.[18] An application for modification or cancellation should be filed 90 days before the expiry of the validity period of the permit. [19]

The permit holder must purchase the third party liability insurance and other relevant insurances for launching a space object.[20] For a project in the stage of a domestic executive launching site, the permit holder shall report the launching plan 6 months before the prearranged month for launch and file an application for approval to leave the factory with relevant materials before entering the stage of a launching site.[21]

The Interim Measures prescribed administrative penalties and criminal liabilities for acts such as concealing the truth, practicing fraud, damaging the interests of the State, undertak-

[14] Decree of the Commission of Science, Technology, and Industry for National Defense of the People's Republic of China (Interim Measures on the Administration of Permits for Civil Space Launch Projects), No.12, Nov. 21, 2002, at art. 2, *available at http://www.fdi.gov.cn/pub/FDI_EN/Laws/InvestmentDirection/GuidanceforSpecificIndustries/t20060620_51408.jsp*.

[15] *Id.* at art. 4.

[16] *Id.* at arts. 5-6.

[17] *Id.* at art. 7.

[18] *Id.* at art. 10.

[19] *Id.* at art. 13-14.

[20] *Id.* at art. 19.

[21] *Id.* at art. 20.

ing projects without authorization, neglecting duties or abusing powers resulting in losses caused to the State.[22]

4.3. National Legal Barriers to International Transfer of Space Technology

For a complete understanding of Chinese space legislation at the present stage, it is important to note some regulations relating to military space activities.[23] The Regulations on Control of the Military Products Export, first enacted in 1997 and revised in 2002, were introduced to strengthen unified management of military products export.[24] Several guaranties must be satisfied before allowing the export of military products: the product must be useful to the self-defense capability of the recipient country; not being harmful to the peace, security and stability of the relevant region of the world; not interfering in the recipient country's internal affairs.[25] As required by the above Regulation, the COSTIND and the People's Liberation Army (PLA) General Armament Department (GAD) further drafted the Military Products Export Control List in 2003,[26] which includes launch vehicles, missile weapon systems and military satellites.[27]

To further strengthen export control system and prevent the proliferation of missiles and other delivering systems that can be used to deliver weapons of mass destruction,[28] the State Council published the Regulations of the People's Republic of China on Export Control of Missiles and Missile-related Items

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[22] *Id.* at arts. 24-26.

[23] List of Chinese Language Statements and Documents, *available at* http://www.nti.org/db/china/chindoc1.htm (last visited Dec. 11, 2007).

[24] Regulations on Control of the Military Products Export, Oct. 22, 1997, at art. 1, *available at* http://cns.miis.edu/research/china/chiexp/regmpe.htm.

[25] *Id.* at art. 5.

[26] Regulations on Control of the Military Products Export, Article 2(2), provides that the military products export control list shall be formulated, adjusted, and promulgated by the state department in charge of military products export. *Id.* at art. 2(2).

[27] Category 8 of the Military Products Export Control List, Mar. 21, 2003. *available at* http://news.sohu.com/97/87/news207378797.shtml (last visited Dec. 11, 2007).

[28] Regulations on Export Control of Missiles and Missile-related Items and Technologies, Aug. 25, 2002, at art. 3, *available at* http://www.nti.org/db/china/engdocs/expreg_0802.htm.

and Technologies in 2002, together with the Missiles and Missile-related Items and Technologies Export Control List. According to the Regulations, rockets, unmanned air vehicles, missiles (ballistic and cruise missiles) and missile-related items and technologies are subject to export control.[29]

A licensing regime is established for the export of the above items and technologies. The exporter should apply to the competent foreign economic and trade department of the State Council with the export application form and relevant documents. The above department shall examine the application (possibly joined by other relevant departments of the State Council and of the Central Military Commission) and make a decision within 45 days after the receipt of the application.[30] The regulation also provides for possible administrative penalties and criminal liability for certain acts.[31]

5. FURTHER DEVELOPMENT

Space legislation is, at the moment, among the highest priorities on the CNSA's agenda. A special task force was set up under the CNSA to study the issue of national space legislation. It has been agreed that space legislation in China should move gradually.

The administrative structure and code of conduct concerning space activities in China are still in the process of development; regulation of specific aspects of space activities shall be the priority of space legislation. Such specific regulations may touch on such issues as investment and financing, insurance and indemnification system, commercial operation and management, and international cooperation. Once the regulations prove to be efficient and practicable, a comprehensive law on outer space may be drafted and adopted. The ultimate goal for China is to have a national space law, complemented by a set of administrative laws/regulations and departmental rules.

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[29] *Id.* at art. 2.
[30] *Id.* at art. 10.
[31] *Id.* at arts. 15-22.

On October 18, 2007, the COSTIND released "the 11th Five-Year Program for National Space Development". This first overall aerospace blueprint plans nine major missions from 2006 to 2010.[32] One paragraph was devoted to the development of space law in China. The Regulation on the Administration of Space Activities is one of the laws to be published in the next five years. This Five-Year Plan also provides that China will start its work on National Space Law (with no settled time schedule). China will enact detailed policies on space industry, which include the policy of providing incentives in using domestic space products (including domestic satellites, remote sensing data and rockets), and the policy of space commercialization and privatization. In the next five years, China will also improve the current price system for space products and make rules on the administration of scientific research and production in outer space, and the administration of import and export of space technology.

Currently, the Regulation on the Liability for Damage in Launching Space Objects has been submitted for approval by the State Council. This draft legislation intends to implement the 1972 Liability Convention. The efforts above have sufficiently demonstrated Chinese Government's firm efforts in carrying out international obligations on space issues and commitment to achieving legal transparency in outer space.

The draft Regulation on the Administration of Space Activities has been circulated for discussion among scholars and scientific experts. It is at the moment soliciting views from various parties and departments, including the Central Military Commission, Ministry of National Defense. Several meetings will be organized to discuss this regulation, one meeting being scheduled by end of this December for discussion among legal scholars. The existing space laws and the above two draft regulations

[32] *China's Five Year Aerospace Blueprint Plan Includes Trips to the Moon, Navigation Satellites*, ALL HEADLINE NEWS, Oct. 19, 2007, http://allheadlinenews.com/articles/7008886845 (last visited October 30, 2007). Highlights of the five year plan include a trip to the Moon, manned space flights, improvements of the Compass Navigation Satellite System, a new generation of carrier rockets and completion of a space industry structure from satellite production to promotion of satellite exports.

will pave the way for a general National Space Legislation for China in future.

LAW

CHINESE LAW: REGISTRATION, LAUNCHING AND LICENSING SPACE OBJECTS

The Faculty of International Law of China University of Political Science and Law and the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi are pleased to present to the readers of the JOURNAL OF SPACE LAW these unofficial translations of Order No. 6 of the Commission of Science, Technology, and Industry for National Defense and the Ministry of Foreign Affairs of the People's Republic of China, 8 February 2001; and, Order No. 12 of the Commission of Science, Technology, and Industry for National Defense of the People's Republic of China, 21 November 2002.

(Unofficial Translation by Faculty of International Law of China University of Political Science and Law)

ORDER NO. 6 OF THE COMMISSION OF SCIENCE, TECHNOLOGY, AND INDUSTRY FOR NATIONAL DEFENSE AND THE MINISTRY OF FOREIGN AFFAIRS OF THE PEOPLE'S REPUBLIC OF CHINA, 8 FEBRUARY 2001

Measures for the Administration of Registration of Objects Launched into Outer Space

"Measures for the Administration of registration of Objects Launched into Outer Space" is issued and comes into effect on the date of issue.

P.R.C. COSTIND
P.R.C. Ministry of Foreign Affairs
February 8, 2001

Art.1 These Measures are formulated for the purpose of strengthening the administration of outer space activities, establishing national registry of space objects, protecting the legitimate interests of China as a launching State of space objects, effectively fulfilling the obligations of a contracting State of the Convention on Registration of Objects Launched into Outer Space.

Art.2 For the purpose of these measures, the term "space object" refers to an artificial satellite, crewed spacecraft, space probe, space station, launch vehicle and parts of thereof, and other human-made objects launched into outer space.

The Sounding Rocket and Ballistic Missile that temporarily crosses outer space shall not be regarded as a "space object."

Art.3 These measures shall apply to all the space objects launched in the territory of China, and the space objects jointly launched abroad by China and other States. The term "launching State" means a State which launches or procures the launching of a space object, and a State from whose territory or facility a space object is launched.

Art.4 China carries out the system of registering space objects. All government departments, juridical persons, other organizations and natural persons which launch or procure the launching of a space object shall have the obligation to register the space object in accordance with these Measures.

Art.5 The Commission of Science Technology and Industry for National Defense (Hereinafter referred to as the COSTIND) shall take charge of the administration of national registration of space objects and the Department of International Cooperation shall be responsible for routine work.

For the national registration involving other joint launching States, the COSTIND, if necessary, after consultation with the

Ministry of Foreign Affairs, determines which one of them shall register the space object.

Art.6 China establishes and maintains a National Register. The information in the National Register shall mainly include: registration number, registrant, owner of the space object, an appropriate designator of the space object, basic characters of the space object, launching enterprise of the space object, name of the launch vehicle, date and territory or location of launch, basic orbital parameters of the space object, and the status of the launching and orbiting of the space object.

See Annex: Form of National Registration of Space Objects.

Art. 7 Subject to the provisions of Article VIII of these Measures, the owner of a space object shall register the space object in the national register. Where there are more than one owners of a space object, the main owner shall register the space object on behalf of all the owners.

The launching enterprise of a space object shall provide necessary assistance in the national registration of such a space object.

Art. 8 Where a space object launched from the territory of China is owned by the government, juridical persons, organizations or natural persons of the State other than China, the corporation which provides the international launching service of the space object shall register it at national registry.

Art. 9 The registrant of a space object referred in Article 7 and Article 8 shall furnish registration information to the COSTIND and complete the registration formalities within sixty days in accordance with Article 6 after the space object has entered the space orbit

When major changes (e.g. change of orbit, break up, cease working or reentry into atmosphere) of the conditions of the space object registered in accordance with these measures occur, the registrant of the space object shall amend the information of the registration within sixty days after the conditions of the space object have been exchanged.

Art.10 The National Register specifically includes sections for Hong Kong and Macau. The specific measures for the regis-

tration of space objects which owned or launched by Hong Kong Special Administrative Region and Macau Special Administrative Region shall be instituted separately.

Art.11 The COSTIND shall maintain the National Register. With the permission of the COSTIND, the relevant government departments and juridical persons, other organizations and natural persons under the authorization of the competent governmental departments may apply to the keeper of the National Register for access to the information in this Register.

Art.12 A space object shall be registered internationally in accordance with the Registration Convention by the COSTIND, via the Ministry of Foreign Affairs within sixty days after the national registration of the space object, at the Secretariat of the United Nations.

Art. 13 According to Article IV(1) of the Registration Convention, the following information concerning each space object carried on its registry: name of launching State or States, an appropriate designator of the space object or its registration number, date and territory or location of launch, basic orbital parameters and general function of the space object, shall be included in international registration.

Art.14 For the international registration of a space object jointly launched by China and other States, the State of Registry shall be determined by the Ministry of Foreign Affairs after consultation with concerned States in accordance with the Registration Convention.

Art.15 The provisions of these Measures related to national registry shall be interpreted by the COSTIND; the provisions related to the Registration Convention and international registry shall be interpreted by the Ministry of Foreign Affairs.

Art. 16 These Measures shall enter into force upon the date of promulgation.

Annex

National Registration Form of Space Objects

Registration number:

Sequence number	Items	Contents	Remarks
1	Registrant		
2	Owner of the space object		
3	Designator of the object		
4	Basic characters of the object		
	(1) Type		
	(2) Functions		
	(3) Quality		
	(4) designed life span		
5	Name of the launching enterprise		
6	Name of the launching vehicle		
7	Date of Launch		
8	Place of launch		
9	Basic orbital parameters of the object		
	(1) Nodal period		
	(2) Inclination		
	(3) Apogee		
	(4) Perigee		
	(5) Position in geostationary orbit		
	(6) Time passing apogee		
	(7) Type of orbit		
10	Status of the launching and orbiting		

ORDER NO. 12 OF THE COMMISSION OF SCIENCE, TECHNOLOGY, AND INDUSTRY FOR NATIONAL DEFENSE OF THE PEOPLE'S REPUBLIC OF CHINA, 21 NOVEMBER 2002

Interim Measures on the Administration of Licensing the Project of Launching Civil Space Objects

"The Interim Measures on the Administration of licensing the Project of Launching Civil Space Objects" is now issued and comes into effect on December 21, 2002.

Minister of COSTIND: Jibin Liu
November 21, 2002

CHAPTER I GENERAL PROVISIONS

Article 1 The present measures are formulated with a view to regulating the administration of the project of launching civil space objects, promoting the sound development of the civil space industry, maintaining national security and the public interests, and fulfilling the obligations of China as a contracting State to the international outer space conventions.

Article 2 For the purpose of these measures, the term "project of launching civil space objects" (hereinafter referred to as "project") means the launch of a spacecraft such as a satellite from the territory of China into outer space for non-military purpose, and the launch of such a spacecraft into outer space from outside of the territory of China while the spacecraft is owned by, or the ownership of the spacecraft has been transferred on-orbit to, the persons, natural or juridical, or the organizations of the People's Republic of China.

Article 3 The administration system of licensing shall apply to the project. Any persons, natural or juridical, or organizations undertaking such a launch project shall, in accordance with the present measures, apply for examination and approval, and shall not carry out the project until he/it is found to be qualified upon examination and has obtained a license for the project.

Article 4 The Commission of Science, Technology, and Industry for National Defense (hereinafter referred to as "the COSTIND") shall plan and administrate the project, and shall be responsible for examining, approving and supervising the project.

CHAPTER II APPLICATION, EVALUATION AND AUTHORIZATION PROCEDURES

Article 5 The general project contractor shall be the applicant for a license. Where there is no domestic general project contractor, the final owner of the satellite or other spacecraft shall be the applicant for the license.

The applicant for a license is required:

(a) to abide by the laws and regulations of China, and maintain the national secrets;

(b) not to endanger the national security; damage the national interests; or violate the national diplomatic policies or the international conventions to which China is a State Party, by the project under application;

(c) not to cause irremediable danger to public health, safety, or properties by the project under application, due to major negligence or intentional acts;

(d) to have the relevant approved documents issued by the competent state departments for carrying out the project under application;

(e) to have technical staff, financial means, and technology information needed for carrying out the project under application;

(f) to meet other requirements provided by laws, regulations, or rules.

Article 6 The applicant shall, nine months prior to the scheduled launch of the project, submit the following documents (in triplicate) to the COSTIND:

(a) an application form for a project license and documents on the qualifications of the applicant for evaluation;

(b) the relevant documents proving that the project conforms to national laws and regulations on environmental protection;

(c) for a project being executed in a domestic launching site, the following information shall be provided: the scheduled time for launch; the technical requirements for the satellite; the launching vehicle and the communication system for launch, observation, and control; the detailed orbital parameters of the launching vehicle; the survey report on the landing area or recovering place; and the documents on detailed orbital parameters of the satellite and the use of frequency resources;

for a project being executed at a foreign launching site, copies of the legal documents on orbital parameters, of the launching vehicle and the satellite, and copies of the documents permitting the use of the relevant frequency resources shall be provided;

a Chinese satellite launch enterprise shall provide a copy of the "Radio Station License of the People's Republic of China" issued by the Ministry of Information Industry for the radio station in outer space;

(d) the safety design report relating to the project and documents relating to public security; supplementary documents concerning the reliability of key safety system, the affects of the launching vehicle, either in normal condition or malfunction during the launch, to the property and personal safety near the launching site and within the range of the launch track, the prevention from pollution and space debris, and other relevant safety; for a foreign-involved project, the documents concerning policy evaluation, confidentiality and security evaluation must also be submitted.

Article 7 The COSTIND shall, within thirty days as of receipt of the application documents, examine the project under application, and issue a license where the requirements are met. Otherwise, no license shall be issued. The applicant and the relevant departments shall be so notified in writing.

Article 8 Where the applicant challenges the conclusion from evaluation, it may apply to the COSTIND for re-evaluation or administrative review in accordance with the law.

Article 9 The relevant evaluation of a foreign-involved project must be carried out by a foreign trade company designated by the Chinese government, and the contract on such a project shall not enter into force until it is authorized by the COSTIND.

CHAPTER III SUPERVISION AND ADMINISTRATION

Article 10 A license shall mainly contain:

(a) the applicant and its legal representative;

(b) the registered address (the applicant's domicile);

(c) main contents of the project;

(d) the scheduled time for launch;

(e) the expiration date of the license;

(f) the organ issuing the license and the time of issuance.

Article 11 The license shall be limited to an authorized project, and shall be automatically terminated after the completion of the project.

Article 12 A license shall not be altered or transferred.

Article 13 Where any content in a license needs to be modified, the licensee shall, ninety days prior to the expiry of the license, file an application to the COSTIND for modification. The license shall not be modified until the modification has been approved upon examination.

Article 14 With respect to a project under planned cancellation, the licensee shall, ninety days prior to the expiry of the license, apply to the COSTIND for cancellation, and the license shall be nullified upon approval.

Article 15 With respect to a project that is impossible to be accomplished due to inappropriate management of the licensee, the COSTIND shall nullify the project license.

Article 16 The COSTIND shall order the licensee to rectify within a time limit, or withdraw the license in a severe case if the licensee:

(a) violates the relevant national laws or regulations or the agreement between China and other states on maintaining confidentiality during execution of the project;

(b) conducts any actions, during execution of the project, endangering national security; damaging national interests; or violating national diplomatic policies or international conventions to which China is a State Party;

(c) carries out the launch activities beyond the limit approved by the license;

(d) conducts other actions in violation of the present measures.

Article 17 With respect to a project for which the license is withdrawn, the applicant for the project shall not, within two years as of the withdrawal, file a second application for a license regarding the same project.

Article 18 Where, due to a licensee's actions, any content of the project is changed, or the project is delayed or cancelled, thus resulting in expenses in relevant aspects, the corresponding liability and the expenses to be borne shall be clarified in the contract by the licensee and the concerned parties.

Article 19 A licensee must comply with the relevant national regulations to insure himself against liability incurred in respect to damage or loss suffered by third parties and against other liability incurred by launching a space object.

Article 20 For a project being executed in a domestic launching site, the licensee shall, six months prior to the scheduled launch, report the launching plan of the project to the COSTIND.

The licensee shall, before commencing the working phase in a launching site, file an application to the COSTIND for approval to release the project from the factory, and provide:

(a) documents on technical conditions of the launching vehicle, quality control, flight test outline, security and confidentiality, and other required documents;

(b) copies of the effective insurance policy of third party liability for the project, copies of the relevant documents (in triplicate), and copies of the relevant effective insurance policies (in triplicate). In exceptional circumstances, written documents shall be provided to the COSTIND and shall be dealt with specifically.

The working phase in a launching site of the project shall not commence until it has been approved.

Article 21 For a project being executed in a foreign launching site, the licensee shall, sixty days prior to the scheduled date for launch, file an application to the COSTIND for approval to release the project from the factory, and attach copies of the final documents (in triplicate) legally binding in respect of the liability insurance for third parties, the relevant insurances, security, confidentiality, etc., and shall not continue carrying out the project until it has been approved.

Article 22 A licensee must, within one month after the completion of a launch project, report to the COSTIND in writing on the accomplishment of the project.

Article 23 The COSTIND shall supervise and irregularly inspect the carrying out of the approved projects, and the authorized officials shall have the right to be present and inspect the relevant activities during the carrying out of the project.

CHAPTER IV LEGAL RESPONSIBILITY

Article 24 A licensee shall have administrative penalties imposed in accordance with the law if he conceals the truth, practices frauds or damages the national interests during application or carrying out of the project. A licensee shall be held criminally responsible in accordance with the law if he commits a crime.

Article 25 If any person, natural or juridical, or any organization undertakes an unauthorized project without a license, the COSTIND shall order the cessation of the illegal activities. Persons or organizations so involved shall have administrative

penalties imposed in accordance with the law, or, if they commit a crime, shall be held criminally responsible in accordance with the law.

Article 26 An organ or an official, which examines the applications for licenses, and neglects its/his/her duties or abuses its/his/her powers during the examination and approval of applications, thus causing loss to the People's Republic of China, shall have administrative sanctions imposed, or shall be held criminally responsible in accordance with the law if it/he/she commits a crime.

CHAPTER V SUPPLEMENTARY PROVISIONS

Article 27 The competent authorities to interpret the present measures shall remain with the COSTIND.

Article 28 The present measures shall enter into force on December 21, 2002.

Annex

Number :

Application Form for Licensing the Project of Launching Civil Space Objects

Title of the Project :

Applicant :

Dates of commencement and end of the project :

Printed by the COSTIND

Date

Instructions

1. For the purpose of this form, the term "Legal Representative" means the legal representative of the applicant entity.

2. The term "superior competent authorities" means State departments or commissions which have administrative powers over the applicant entity or state-owned large-scale enterprise group controlling the applicant entity or the provincial, autonomous regional or municipal offices of the COSTIND; where the applicant is a natural person, the provincial, autonomous regional or municipal office of the COSTIND shall issue certificate and provide opinions.

3. Use additional paper if the column space for relevant information in this form is insufficient.

4. Use dark colored ink and make sure the handwritings are neat and clear. This form shall be submitted in triplicates.

Applicant Entity					
Registered Capital		Registered Name			
Legal Representative		Age		Gender	
Occupation		Title		Nation-ality	
Telephone Number		Fax Number			
Correspondence Address		Postal Code			
Contact Person for the Project		Telephone number			

Bank Name		Account number	

Entities involved in the Project and the work distribution			
Name of the Entity	Assumed work	Legal Representative	Remarks

2. Significance, goal of the project and foreign counterpart projects' status quo

3. Contents of the Project

The main use of the payload:

Parameters of the satellite entering the Earth orbit:

Section 2.02 Orbital parameters of the satellite:

Technical parameters of the designated launch vehicle:

Foreign-involved issues, if any:

Other matters to be clarified:

4. Conditions currently available (including the research level, information preparation and methods of scientific research)

5. Project Plan			
Main Working Phases of the Project			
Main working phases	Form of the completion of each working phase	Time consumed	Responsible Entity
Total time to complete the project			
Final form of the completion of the project			

6. Basic information of staff involved in the Project					
Name	Age	Title	Employer	Specialty	Work assigned

7. Opinions of the Applicant Entity

Signature of the Legal Representative

Seal

Date

8.Opinions of Superior Competent Authorities

Seal

Date

This is an Unofficial Translation of the Geospatial Information Utilization Promotion Bill. It is offered to the readership of the JOURNAL OF SPACE LAW as a convenience.

While this translation's title says the legislation is a "Bill," the Geospatial Information Law of Japan was enacted May 30, 2007, and has been effective since August 29, 2007. There were no differences between the bill and the enacted law. The Diet passed the law without amendment.[1]

GEOSPATIAL INFORMATION UTILIZATION PROMOTION BILL

Index

[1] Hiroshi Kiyohara, chief attorney, Musashi International Law Office, Tokyo. Mr. Kiyohara is admitted and licensed in Japan and the United States (New York & California). He served as an assistant judge for Tokyo District Court.

Section Three
Policies and Measures concerning Satellite Positioning (Article 20 and Article 21)

Supplementary Provisions

CHAPTER ONE

General Provisions

(Purpose)

Article One

The purpose of this law shall be to promote in a planned and comprehensive manner the overall measures and policies to advance the utilization of geospatial information by means of establishing the fundamental items of an appropriate policy for the utilization of geospatial information along with clarifying the responsibilities together of national and regional public organizations and establishing the fundamental principles concerning the promotion of geospatial information by recognizing that it is extremely important to promote high level utilization of geospatial information to successfully materialize an economic society which can operate for the rich and stable life of the citizens now and in future.

(Definitions)

Article Two

For this law, "geospatial information" shall be deemed information that is derived from the information of (1) or the same as the information of (1) and the information of (2).

(1) Information that indicates the location of a particular geographical point or area from the space above (includes information relating to the point in time which concerns such information). (Hereafter is referred to as "position information".)

(2) That information which is associated with the information of the preceding number.

Section 2 For this law, "Geo-information System" shall mean that system which makes it possible to understand or analysis geographically of geospatial information and is referred to as an information system that handles in a unified manner an electronic map derived from using an electronic computer on the geospatial information, which has been recorded by an electro-magnetic method (Termed an electro-magnetically recorded map. Hereafter will be referred as electronic map).

Section 3 For this law "base map information" shall become the fundamental point of measurement in order to establish the position of geospatial information for electronic maps and shall include the coast lines, the boundary lines of public facilities, administrative boundaries and other position information established by the Ministry of Land, Infrastructure and Transport ordinances (this shall be limited to that which matches the standards established by the Ministry of Land, Infrastructure and Transport ordinances) and shall be referred to as electro-magnetically recorded materials.

Section 4 For this law, "satellite positioning" shall refer to the information obtained from a signal which has been projected from an artificial satellite used for determining position and the information obtained concerning the time of the aforementioned position together with associated information such as change of path over time.

(Fundamental Principles)

Article Three

The promotion of geospatial information utilization, which includes such things as base map information, statistical information and image information for surveying, has to be taken into consideration as an absolutely necessary fundamental to healthy national economic development and improvement of the lives of citizens. The accurate appropriate maintenance and delivery of this geospatial information by means of electro-magnetic methods and the delivery of geographical information system, promotion of the use of technology like satellite positioning, development of human resources, strengthening and

maintenance of the necessary system of cooperation between the related agencies of national and regional public organizations and other policies and measures, are subjects which must be conducted systematically and comprehensively in line with these principles.

Section 2 In terms of the policy concerning the promotion of the use of geospatial information, a mutual contributing reciprocal relationship by which the geographical information system delivering a base map for using the geospatial information that can be obtained from satellite positioning, and satellite positioning that delivers stable geospatial information which can be used with the geographical information system must be taken into consideration, and the subject of focus should be to maintain an environment that enables utilization of high level geospatial information with combined geographical information system policies, measures, and satellite positioning policies and measures in effect.

Section 3 The policies and measures concerning promotion of geospatial information utilization must take into consideration the current situation which is fundamental to improvement of the lives of citizens and the healthy development of the public economy through the delivery of information regarding satellite positioning such as change of path, time, and precise position, and must be discussed focusing on ensuring a environment that enables stable enjoyment with service from highly reliable satellite positioning.

Section 4 The policies and measures concerning promotion of geospatial information utilization must contribute to the protection of wealth and the people, national life along with the promotion of conservation and maintenance, take into account national land use, plan for promotion of fire prevention measures, and effectively and efficiently manage public facilities by implementing and positively taking up pursuance around business, or administration of those national and regional public organizations.

Section 5 The policies and measures concerning promotion of geospatial information utilization must contribute to a higher level of these functions and efficient operation of the government in planning for improved transparency and mobility, com-

prehensiveness of policies and measures, multiple correction of map creation by means of the common use of geospatial information necessary for the various fields of government.

Section 6 The policies and measures concerning promotion of geospatial information utilization must contribute to improvement of the convenience of the citizens through actual delivery of the various services which use geospatial information.

Section 7 The policies and measures concerning promotion of geospatial information utilization with planning, in accordance with the environment, must contribute to continuous development, improvement of vitality in the economic society, higher and more efficient business activity, and healthy development and creation of various businesses which use geospatial information.

Section 8 In terms of the policies and measures concerning promotion of geospatial information utilization that must be discussed, consideration must be given to activating the capability of private businesses by making use of their originality and ingenuity, and proposals regarding technology in order to utilize geospatial information by private businesses.

Section 9 In terms of the policies and measures concerning promotion of geospatial information utilization that must be discussed, consideration must be given in order that national safety and the rights and profit of the individual are not harmed with expansion of the distribution of geospatial information.

(National Obligations)

Article Four

The national government in compliance with the fundamental principles of the preceding Article (hereafter referred to as "fundamental principles") has the responsibility to formulate and implement comprehensive policies and measures concerning the promotion of geospatial information utilization.

(Local Public Organization Obligations)

Article Five

The local public organizations, in compliance with the fundamental principles, has responsibility to formulate and implement comprehensive policies and measures concerning the promotion of geospatial information utilization which respond to the conditions of each area in line with appropriate burden sharing with the national government.

(Business Strengths)

Article Six

The details of surveying, creation of maps, or a geographical information system are the services which use satellite positioning and are performed by those businesses and other related providers in compliance with the fundamental principles. All participants shall strive themselves to deliver quality geospatial information, and along with the national government and local public organizations shall endeavor to cooperate in implementing policies and measures concerning the promotion of geospatial information utilization.

(Coordination of Strengths)

Article Seven

As a nation, the policies and measures necessary to strengthen the cooperation between these participants must be discussed by taking into consideration efficiently promoting geospatial information utilization by cooperating with the mutual partnerships planned between the research organizations of universities, business entities, and the national and local public organizations.

(Legislative Measures)

Article Eight

The government must take up legislative or fiscal and other measures that are necessary in order to implement policies and measures concerning the promotion of geospatial information utilization.

CHAPTER TWO

Geospatial Information Utilization Promotion Master Plan

(Formulation of the Geospatial Information Utilization Promotion Master Plan)

Article 9

The government must formulate a fundamental plan concerning the promotion of geospatial information utilization (hereafter referred to as the "geospatial information utilization promotion master plan"), in order to promote comprehensive planning of policies and measures concerning the promotion of geospatial information utilization.

Section 2 The particulars for the geospatial information utilization promotion master plan are listed below.

a) The basic directions with regard to the policies and measures concerning the promotion of geospatial information utilization.

b) Items relating to the policies and measures concerning the geographical information system

c) Items relating to the policies and measures for satellite positioning

d) In addition to the particulars of the preceding c), the items necessary in order to promote in a planned and comprehensive manner the policies and measures concerning the promotion of geospatial information utilization.

Section 3 In principle, the time period shall be established for the concrete goals of the policies and measures and their at-

tainment with regard to establishing the policies and measures for the Geospatial Information Utilization Promotion Master Plan.

Section 4 The Government, when the geospatial information utilization promotion master plan is formulated per the provisions of item a), must officially announce it without delay using the Internet and other appropriate means.

Section 5 The Government, at an appropriate time, will survey the conditions for attaining the objective established per the provisions of item c), and must officially announce the results using the Internet and other appropriate means.

Section 6 Mutatis Mutandis applies to the provision of item d), relating to changes in the geospatial information utilization promotion master plan.

(Maintenance of a cooperative framework of related government organizations)

Article Ten

The Government should take up measures necessary to maintain a system of cooperation by the related government organizations and other measures in relation to formulation of the geospatial information utilization promotion master plan and implementation of basic policies and measures.

CHAPTER THREE

Fundamental Policies and Measures

Section One General Provisions

(Implementation of Survey and Research)

Article Eleven

The national government shall formulate and implement the appropriate surveys and research necessary for the policies and measures concerning the promotion of geospatial information utilization.

(Dissemination of Knowledge)

Article Twelve

The national government should take up the necessary policies and measures to enlighten and disseminate knowledge and other policies and measures relating to geospatial information utilization in order to deepen the appreciation and understanding of citizens concerning the importance of geospatial information utilization.

(Development of Human Resources)

Article Thirteen

The national government should take up the policies and measures necessary to develop human resources having the specialized knowledge or technology for promoting geospatial information utilization.

(Government Utilization of Geospatial Information)

Article Fourteen

The national government and local government public organizations should take up the policies and measures necessary to plan improved convenience for citizens relating to the promotion of geospatial information utilization along with improving the variety of services, quality, and other aspects in the public field as well as the expansion of the utilization of the geospatial system to efficiently manage government administration and business, and be conducive to sophisticated functionality.

(Protection of Personal Information)

Article Fifteen

The national and local public organizations should take up the policies and measures necessary for citizens to be able to use geospatial information appropriately and with assurance, maintaining the appropriate handling and protection of personal information, in order to display base map information maintaining its reliability, quality, and other aspects.

SECTION TWO

Policies and Measures for the Geographic Information System

(Maintenance of Base Map Information)

Article Sixteen

In terms of the technology for the maintenance of base map information, the national government shall establish a standard in order to plan for the dissemination of the geographic information system by promoting common use of base map information.

Section 2 In order for the national and local public organizations to attain the objectives of the preceding item, the policies and measures should be addressed which are necessary for the maintenance of base map information which matches the

standard of the technical basis of same preceding item, appropriate timing of renewal, and other aspects.

(Mutual Utilization of Base Map Information for Map Related Affairs)

Article Seventeen

The national government and local government public organizations shall endeavor to utilize reciprocally base map information, which is already maintained with regard to areas that become objects of the map, when creating maps in order to implement administration or business for executing use of the map for each necessary government field such as city planning, management of public facilities, agricultural land, management of forests and other resources, cadastral surveying, title registry of real estate, taxes, statistics, and others.

(Smooth Circulation of Base Map Information and other information)

Article Eighteen

The national government and local government public organizations should take up the policies and measures in consideration of base map information being conducive to high level utilization of geospatial information which can be used for the whole society and that is deemed necessary for constructive delivery of base map information, statistical information, and electro-magnetically maintained image information for surveying, and delivery and smooth circulation of geospatial information.

Section 2 The national government shall in principle deliver base map information such as it possesses free of charge using the internet.

Section 3 The national government, in addition to the preceding item Two, shall take up policies and measures as necessary in order to accelerate the utilization of geospatial information by citizens and businesses, to provide technical advice, to deliver information, and others.

(Promotion of Research and Development for the Geographical Information System)

Article Nineteen

The national government shall take up policies and measures as necessary in order to plan development of the geographical information system to accelerate the development and research, conduct prompt evaluation, disseminate the results, and other aspects.

SECTION THREE

Policies and Measures for Satellite Positioning

(Liaison and Coordination for Satellite Positioning)

Article Twenty

The national government should take up policies and measures as necessary in order to promote utilization of geospatial information by efficiently maintaining an environment that makes it possible to enjoy sustainable service by highly reliable satellite positioning.

(Promotion of Research and Development for Satellite Positioning)

Article Twenty One

The national government should take up policies and measures as necessary in order to promote utilization of geospatial information which can be obtained by satellite positioning, promote the demonstration in relation to research and development for satellite positioning, technology, and utilization possibilities along with the limitations for accelerating the utilization of satellite positioning based upon the outcomes of the research conducted.

SUPPLEMENTARY PROVISIONS

This law shall be implemented as a designated government ordinance within 3 months from the date of official announcement.

GROUNDS

In consideration of it being of extreme importance to promote high level utilization of geospatial information to successfully materialize an economic society which can operate for the rich and stable life of the citizens now and in future, it is necessary to establish the items that are fundamental to the policies and measures relating to the promotion of geospatial information utilization, along with clarifying the responsibilities together of national and regional public organizations in establishing the fundamental principles concerning the promotion of geospatial information in order to determine the policies and measures to promote geospatial information utilization in a planned and comprehensive manner. These are the grounds for submitting this bill.

BOOK REVIEW

DIREITO E POLÍTICA NA ERA ESPACIAL: PODEMOS SER MAIS JUSTOS NO ESPAÇO DE QUE NA TERRA? (LAW AND POLICY IN THE SPACE AGE: CAN WE BE MORE JUST [OR EQUITABLE] IN SPACE THAN ON EARTH?)

By José Monserrat Filho

Reviewed by Sylvia Ospina*

A book on space law is rare. A book on space law in Portuguese is even rarer. A book on space law that is in very readable prose (if you can read Portuguese), that is instructive and made entertaining with occasional touches of humour is a rarity indeed! That is what we have in José Monserrat Filho's book, "Direito e Política na Era Espacial: Podemos ser mais justos no espaço de que na Terra?", "Law and Policy in the Space Age: Can we be more just [or equitable] in Space than on Earth?" published by Vieira & Lent, Rio de Janeiro, Brazil, in July 2007.

The book is divided into 12 chapters, the topics of which flow from one chapter to the next, yet each could stand alone as a monograph. A real plus is the inclusion as annexes of the 5

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outer space treaties and 5 Principles adopted by the United Nations General Assembly (UNGA), which constitute the core of space law. Also included in the annexes are several Declarations of the UNGA, (e.g., on the use of nuclear power sources in Space; on cooperation for the benefit and in the interest of all States, but particularly for developing countries; Declaration on the Right to Development). The November 2004 Buenos Aires Declaration on Cooperation in Space Law, drafted by the author and by Maureen Williams, is also included in the annexes.

This book is more than just an analysis of the background of space law, and the salient articles of the space treaties and Principles. It is a very strong critique of the increasing privatization of space activities, their commercialization, and the ever-growing influence of the private sector in these endeavors. The close relationship between government and corporations involved in defense work is not new—President Eisenhower warned against the growing "military-industrial complex" in the 1950s. This relationship has deepened in the last 15-20 years, resulting in governments in many countries being beholden to foreign corporations and their economic influence in all phases of national life. The current depth and extent of this relationship is highlighted by numerous quotes from prominent economists from various countries. These economic authorities, as well as Monserrat, question whether these relationships are ultimately good and for the benefit of humankind (one of the tenets of space law), or whether the economic well-being of shareholders and CEOs is the primary goal.

The author stresses the need to use the resources in space (especially remote sensing satellites) to better monitor the global changes that humanity is causing, and to apply this knowledge for the benefit of humankind, for the economic and social development of nations. Are these goals incompatible with the basic philosophies of corporations, whose major "raison d'être" is profit-making for their shareholders? To an extent they are, but the author also notes that, despite corporate economic and political power, the governments are still the ones who draft and enact the laws. The increasing tension between corporations (economic goals) and space policy (for the benefit of

mankind and for development) is presented in a challenging manner throughout the book.

The first two chapters serve as an introduction to the development of space law, which came about as a result of the Cold War, and the race to space that began with the launch of *Sputnik* in October 1957. As the author notes, *Sputnik* was not just an inoffensive emitter of beeps; in reality it was the first intercontinental ballistic missile, which put the world on notice that the U.S.SR could send missiles anywhere around the world. Thus, the Space Age was born into a military milieu, and the militarization of outer space continues, even though outer space itself until now has not been used as an arena for armed conflict or war. However, as Monserrat notes, the Chinese destruction of a satellite in orbit in January 2007 has changed this, and given rise to a new arms race: the production of anti-satellite weapons in several countries.

Due to *Sputnik's* potential reach (as an intercontinental ballistic missile), serious international legal and policy issues arose: these were the seeds for the development of space law. In the late 1950s, the basic principles and resolutions which became the core of space law were drafted by the UN's newly established Committee on the Peaceful Uses of Outer Space (UNCOPUOS) and adopted with "cosmic speed." But like the Moon, they have a dark side and a light side. Fifty years later, like the Moon's craters, some lacunae in space law are visible, and have yet to be filled. The fundamental concepts, namely that space is to be used for the benefit of all humankind, and that outer space cannot be appropriated by any country still prevail, even though they may be under attack by those who want to privatize and commercialize most space activities.

Chapter 3 has an interesting title: "Space Law of the Planet Earth." This chapter highlights the principle points – and lacunae-- of the Outer Space Treaty. The author's basic argument is that space law isn't concerned only about outer space; rather, it has more to do with activities on Earth, and the need to protect and safeguard our planet. Early in the Space Age, threats to our existence came from the weapons developed during the Cold War. Nowadays, we are threatened by global climatic changes, which can be monitored from outer space. Monserrat urges the

creation of new cooperative programs to make better use of the information gleaned by Earth observation satellites, and cites some new initiatives, such as the Group on Earth Observations (GEO) work to establish a Global Earth Observation System of Systems (GEOSS), whose aim is not only to monitor the Earth, but to better understand the interaction of the Earth and its basic elements – water, climate, atmosphere. The author stresses that what is needed is the political will to take adequate measures and to implement them, with the aim of safeguarding our planet.

Chapter 4, "More Justice in the Skies than on Earth?" continues with the theme of the previous chapter—that space law is firmly anchored in terrestrial concerns. One question that arises is whether space law is adequate to attain values that will inspire a particular legal order; the author states that the answer is a YES! Monserrat notes that no State has renounced the principles enunciated in the Outer Space Treaty, despite some gaps and the need for more precise definitions to respond to the issues raised with the growing privatization and commercialization of space activities, as well as its increasing militarization, or "strategic use." Monserrat notes that we need to change our behavior patterns, to minimize global warming and other changes that we are causing on our planet. While space technology is essential to make more rational use of our terrestrial resources, Monserrat stresses that a more rational and equitable order needs to be established in the use of space as well.

One concern raised in this chapter, and expanded upon in chapters 5 and 6 is the increasing role of private corporations, whose reach influences international relations, foreign policies, and the global economy. The author cites several economists, among them John K. Galbraith, who stated that although corporations are an essential fact of modern life, they need to be restrained, and should act in conformity with certain rules. The author elaborates on the growth of the "military-industrial complex", pointing out that in the last few years, in the United States there has been a notable reduction in the number of corporations involved in the defense sector, as they have merged with one another, been acquired, or otherwise consolidated into a handful of very powerful corporations, such as Lockheed-

Martin and Boeing. While ostensibly these mergers reduce costs, they also stifle innovations, and eventually lead to higher program costs.

While these "mega corporations" do not overtly challenge the fundamental principles of space law, they closely follow the activities at UNCOPUOS and the International Telecommunication Union's (ITU) Radio Conferences and other meetings, impeding any substantive modifications to the treaties or principles, thereby stalling meaningful progress, by arguing, for example, that no definition or delimitation of outer space is necessary; or that placing weapons in outer space is not contrary to the principles of the Outer Space Treaty. This could lead to disregarding a basic principle – that space activities should be conducted for the benefit of humankind, and not only for private corporate gain. Because of their close relationship with the legislators, Monserrat stresses that it is important to have some mechanisms in place to ensure that the common good or public interest is not replaced by corporate objectives.

The issues of the growing privatization and growing influence of private interests in space activities have been studied at many international legal fora that have concluded that there needs to be a counterbalancing policy, to ensure that the common good prevails. With the blurring of national borders, it is more difficult to assign responsibility as well as liability for space activities, resulting in corporations supplanting the State's authority. The author urges greater international governmental cooperation and action, to regulate the global economy in a more democratic manner. Monserrat quotes the eminent space jurist, the late Manfred Lachs, who stated that it is essential to remain faithful to the main objective of space law, i.e., to serve the interests of all nations, for the protection of life, both on Earth and in space, and to assure international peace and well-being.

Chapter 7, "Acts of Aggression in Outer Space" poses important questions that need to be taken into account, to understand and to prevent the U.S. Government's plan to further militarize space, and convert it into a war theater, albeit as part of a strategic defense plan. The first question posed is: why be concerned by aggression in outer space today? Even though in the last 50

years, there has been no act of aggression from outer space, the U.S. is keen on its continued militarization or weaponization, on developing new space-based anti-missile, anti-satellite defense systems, capable of knocking out other countries' satellites. The current Bush Administration is intent on developing these new systems, as a preventive measure, to preempt other States from shooting down U.S. satellites, which are vital to the U.S.A's economic and political life. But, as the author points out, the U.S. could be the first victim of its own strategic plan, since it is no longer the only space power. (China, Russia and other nations have the potential to destroy satellites in orbit).

Rather than create a safer environment, these space-based defense systems lead to uncertainty, and to higher costs of doing business in space, dissuading further investments, and negatively impacting on the whole space sector. Before continuing on this course, Monserrat urges that the legal implications of space-based defense systems be considered, because space activities are now fundamental to all human activity. (The author cites John Logsdon, of George Washington University's Space Policy program, who stated that if the U.S.'s Global Positioning System (GPS) were to malfunction, all kinds of terrestrial systems that rely on GPS, ranging from dispatching emergency vehicles to banking, would be affected).

Another issue raised in this chapter is what would be the consequences of a "Pearl Harbor" in space? While the United States tends to overestimate the threat posed by other countries, a first or preemptive strike could come from any country that believes it has sufficient power to challenge the U.S. Thus, the U.S.'s quest for dominance in outer space is leading to an untenable situation and creating insecurity throughout the world.

The author notes that since 1998, the U.S. and other nations have blocked negotiations on disarmament, and the U.S. has renounced certain treaties (the ABM Treaty), removing (for itself) legal barriers to placing weapons in space. The U.S. refuses to sign any agreement that might limit its testing and placing weapons in space, claiming its right to protect its space-based assets; it no longer pretends that its activities are "consistent with its treaty obligations". The Russians and Chinese are

studying the possibility of constructing their own anti-satellite weapons, even while their delegations to UNCOPUOS have proposed a new treaty that would prohibit weapons in space, aiming to put an end to this new arms race in space. Yet, most States engaged in space activities emphasize the importance of ensuring that space be used for peaceful purposes, whether scientific or commercial. But without the cooperation of the U.S., any plans to achieve some transparency in outer space and to prevent an arms race in space will go nowhere.

Another question raised in Chapter 7 is whether international law has any "weapons" which can be used to counter acts of aggression in space. Monserrat presents a detailed analysis of what constitutes hostile use of force, and whether in the air, the high seas or in outer space, it is deemed to be an illegal act of aggression, according to the principal sources of international law, including the UN Charter, the Outer Space Treaty, and various UNGA Resolutions, which prohibit the placing of weapons of mass destruction in outer space. All these legal foundations, however, do not seem to be sufficient to deter any act of aggression in space. Thus, another Resolution, 61/68 (2006) on the "Prevention of an arms race in outer space" specifically addresses this issue, but the author notes that it is necessary to adopt new measures to verify compliance with these Resolutions.

The issue of prohibiting anti-satellite weapons has been debated for more than 20 years, both at the UNGA and at Unispace II (1982), and several proposals have been made, but none has been adopted. These past efforts, however, could be valuable resources for today's debates on the same topic, namely, to prevent the militarization of outer space.

The last question posed in this chapter follows from the previous one: "How to establish broad yet solid legal guarantees for peace and security, to prevent acts of aggression?" One way would be to consider a war in space as against the principles of international law, and thus the negation of any principle of justice and law. The law has to be seen as a series of regulations aimed at maintaining peace, and peace is the absence of war. Where law prevails, peace can eventually prevail, since law is the antithesis of war.

Monserrat suggests that a new treaty be drafted, which would include principles on non-proliferation of weapons; security and cooperation in outer space; protection against missile attacks; the prohibition of using space for military (defense) purposes, which would entail destroying existing anti-satellite weapons. A treaty of this nature would ensure that outer space is used for peaceful purposes, for the benefit of all nations, and that it is maintained as a "*res publica*", or common good.

Chapter 8 addresses the issue of space debris, what to do with it, what measures can be taken to mitigate and minimize the dangers posed by the increasing amount of space debris, so that future space activities will not be at risk, a risk created through time by humans themselves. As the author notes, unfortunately, humankind is notorious for its abundant production of trash.

One of the major problems with space debris is the number of untrackable objects and fragments which are in random orbits, creating the risk of collisions with objects in orbits, and that can be tracked. Small fragments present even greater risks, due to the high velocity at which they are traveling. As more objects are launched to outer space, the amount and dangers of space debris also increase.

Several organizations, such as the Inter-Agency Space Debris Coordination Committee (IADC), and the ITU have formulated recommendations to minimize space debris, to remove satellites that have reached the end of their useful life in orbit, and place them in other orbits where they will not present a hazard to operational spacecraft.

Another important document came out from the International Law Association (ILA) meeting in Buenos Aires, Argentina in 1994, wherein certain terms are defined. The ILA's endeavors became the cornerstone for the 1996 COPUOS's "Declaration on International Cooperation", which aims at regulating space debris. The IADC also drafted some regulations which were submitted to COPUOS in 2002, and after arduous debates, they were adopted by COPUOS's Scientific-technical Subcommittee in February 2007. This is the first specific result of much discussion since 1999, when COPUOS published its "Technical Report on Space Debris." A great effort was made to have this

item included on COPUOS's agenda for 2008, but the necessary consensus was not achieved.

Specific recommendations for the reduction of space debris, to minimize the hazards presented by these objects include: reducing the number of objects or components ejected at time of launch; minimizing the risk of accidental disintegration during operational phases; limiting the possibility of in-orbit collisions; not engaging in the intentional destruction of objects in space. Also, avoid having objects remain in low Earth orbit(s) at the end of their useful missions; these objects should be de-orbited in a controlled fashion, or placed in other orbit(s). This same recommendation is made for spacecraft in geostationary orbit; these are usually placed in a much higher ("graveyard") orbit.

As the author notes, not just space agencies or launching corporations are worried by the hazards of space debris; other organizations are also concerned. The International Association for the Advancement of Security in Space (IAASS), a NGO established in the Netherlands in 2004, suggested the creation of an entity similar to the International Civil Aviation Organization (ICAO), which would draft and enforce measures and regulations regarding space debris. The aim is to protect the billions of dollars invested in communication, remote sensing and scientific satellites currently in orbit, and future objects launched to space. This proposal was presented to the highest level global economists at the G-8 meeting in Germany in June 2007, but seemed to fall on deaf ears. If the issue of space debris is not addressed now, and no measures taken to minimize them, future solutions may result in even more expensive "cures" to solve this growing and hazardous problem.

The following three chapters deal with space and national development; development and human rights and cooperation in space, and with remote sensing data and national development. They examine the growth of the legal basis of development law, and the right to development, topics that have been under consideration since the 1960s, when the New World Economic Order (NWEO) was first proposed. Few initiatives have generated as much discussion and debate, fuelled in part by the growing awareness of developing countries that they have a right to develop, and to benefit from scientific and technological progress.

Further, these issues have been discussed at many conferences, and numerous UN Resolutions and Declarations attest to the benefits that would come from sharing this progress in a more equitable manner.

The author presents a very detailed historical analysis of the right to development, and the many initiatives that have been undertaken to achieve a more equitable development process, but notes that most developing countries are still highly dependent on a few industrialized countries, particularly when it comes to obtaining data and information gathered by remote sensing or Earth observation satellites. (Since its creation in1964 , INTELSAT provides satellite communications to most countries, and many nations have their own national satellite systems).

As was noted in an earlier chapter, all countries now depend on space resources, not only for communications but also for development. Having a national satellite is no longer an issue of prestige, but a necessity for development, according to South Africa's Minister of Science and Technology, as quoted by Monserrat. The author notes, however, that it is not enough to have a satellite in orbit; what is needed is the development of infrastructure, so that all countries can process geospatial data and images, and use this information for their economic and social development.

The value of these chapters lies in the author's alluding to the social and economic development of so many sectors, and the extent to which all rely on satellites for their continued growth if not existence. Economic development and social progress should be concerns of the whole international community, and at the same time that economic prosperity is achieved, they should contribute to reinforcing peaceful relations and cooperation among countries. This statement, made during the first UN Conference on Trade and Development in 1964, is still valid today. This sentiment is also reflected in the 1967 Outer Space Treaty, and in the Moon Treaty. The "common heritage of mankind" principle embedded in the Moon Treaty is basic to development, even though it is not widely accepted.

Another value of these chapters is their tying in development in space activities with terrestrial development, and not-

ing that so many more countries are involved in space activities; space is no longer the purview of just 2 or 3 industrialized countries. As Monserrat stresses, however, what is needed now is the development of national capacity to analyze and use the information obtained from space, tailored to the needs of each State. While space needs to be used for peaceful purposes, it also needs to be used for national political and legal development. Space law at present maintains the status quo among nations, but also maintains the disparity between the industrialized and the developing countries. Unless space law becomes an essential component of national development, the gap between these countries will continue to grow.

UNCOPUOS must take the lead in bridging this gap, and several proposals have been made to do so. Brazil, in particular, proposed a new agenda item, to be studied over the next years, on "International Cooperation and the Use of Geospatial Data for Sustainable Development." The objective of this proposal is to stimulate international cooperation in the creation of a national infrastructure that can obtain, analyze, and use geospatial data as an instrument for sustainable development. Much of the data has high commercial value, not only for the country subject to sensing or observation, but also for other nations.

In order to achieve wider dissemination of the data, Brazil recommends that "open code software" be made available, to create a global and accessible network. According to Monserrat, open code software is the key to the success of international cooperation, and would become an integral component of sustainable development.

How to achieve these goals? The last chapter, "The Future of Space Law" includes specific proposals to attain them, as well as to ensure that space law is able to meet the needs of the space age of the 21st century. The current paralysis at UNCOPUOS must be overcome; this organism needs to be revitalized, and the five space treaties and Principles need to be updated, to take into account the new and different players and activities in space. National space legislation also needs to be drafted, and perhaps new regulations will fill some of the lacunae in current international space law. Areas that should be subject to some regulation include the delimitation/definition of

outer space; space tourism; space debris; space traffic management; GPS and similar systems; commercialization of space; prevention of placing weapons in space; using satellites for the prevention or at least mitigation of natural disasters on Earth.

Ultimately, space law is international law, and greater cooperation among nations is needed. To achieve this, the author also suggests that an International Space Organization be established, which would serve to coordinate national and international efforts related to space activities, that need be regarded as essential public international services. At the same time, more people need to be made aware of the importance and relevance of space law as a means of regulating space activities for the benefit of all countries and mankind.

This book makes some very interesting and worthwhile proposals and recommendations, which should be heeded if space law is to progress beyond the treaties and principles drafted 40 years ago. Perhaps because satellite communications have become so ubiquitous, we tend to take them for granted. But Earth observation or remote sensing satellites could play an equally important role in the economic and social development of most countries. The author's focus on these could serve as a "wake up call" and be the basis for major changes in access to and use of geospatial data and its dissemination for the benefit of humankind.

It is gratifying to note that this excellent book was written by an eminent space lawyer from a "developing country", thus providing the legal community with a different perspective on the issues of space activities, space law, and their impact on national development.

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