

MAKING DO WITH WHAT WE HAVE:  
CREATING CERTAINTY IN PRIVATE SPACE LAW

by

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## **ABSTRACT**

Space business is subject to many of the same realities as commercial enterprises in other locations and other market sectors. In addition, the space treaties impose a separate set of obligations on conduct in space. Predictability is necessary to continue development of this profound resource.

The present state of the space marketplace is examined, noting current trends. The legal framework regulating these activities is described. Uncertainties in commercial space projects are identified and solutions proposed. A case study of a failed space transaction is analyzed and resolutions considered. The thesis ends with recommendations and an understanding of the role that private space law plays.

## **ABSTRAIT**

Les affaires de l'espace sont sujettes à des plusieurs des mêmes réalités que des entreprises commerciales dans d'autres endroits et d'autres secteurs du marché. En outre, les traités de l'espace imposent un ensemble séparé d'engagements à la conduite dans l'espace. La prévisibilité est nécessaire pour continuer le développement de cette ressource profonde.

L'état actuel du marché de l'espace est examiné, notant des tendances courantes. Le cadre juridique réglementant ces activités est décrit. Des incertitudes dans des projets d'espace commerciaux sont identifiées et des solutions sont proposées. Une étude de cas d'une transaction échouée de l'espace est analysée et des solutions est considérées. La thèse finit avec des recommandations et un arrangement du rôle les jeux privés de cette loi de l'espace.

## **INTRODUCTION**

“Toto, I’ve a feeling we’re not in Kansas anymore”<sup>1</sup>

Dorothy

The commercial space sector continues to expand, with new technologies and new entrants fueling development. More states have launching capability, a growing percentage of launches are commercial in nature, and even military payloads ride “piggyback” on commercial satellites. None of this is occurring in a vacuum. The trends in space, as in virtually all international commerce, are moving toward increased globalization of private interests, consolidation of transnational businesses, and partnerships between public and private actors.

This rapid and exciting growth must function within an existing international treaty regime that is, at best, very broad in its principled requirements and, at worst, simply silent on the current practical realities of facilitating legally compliant business activity in space. The role of the nation-state has significantly changed since the treaties went into force.<sup>2</sup> The dynamics of power, both politically and in business, are moving from vertical paradigms, such as command/control or top-down, to bottom-up, or

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<sup>1</sup> The Wizard of Oz (1939) screenplay online:< [http://sfy.ru/sfy.html?script=wizard\\_of\\_oz\\_193](http://sfy.ru/sfy.html?script=wizard_of_oz_193)> (date accessed: 15 March 2009).

<sup>2</sup> Space policy first emerged during the Cold War. Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, opened for signature at Moscow, London and Washington, on 27 January 1967, entered into force 10 October 1967; Agreement on the Rescue of Astronauts and the Return of Objects Launched into Outer Space, opened for signature at Washington, London and Moscow on 22 April 1968, entered into force 3 December 1968; Convention on the International Liability for Damage Caused by Space Objects, opened for signature at London, Moscow and Washington on 29 March 1972, entered into force 1 September 1972; Convention on Registration of Objects Launched into Outer Space, adopted by the General Assembly of the United Nations, at New York, on 12 November 1974, entered into force 15 September 1976; Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, opened for signature 18 October 1979, entered into force 11 July 1984.

increasingly, horizontal models.<sup>3</sup> Slim is the likelihood of a new space treaty achieving consensus soon enough to meet present business needs, discussed *infra* in Chapter One. To further complicate matters, national space laws and policies in multi-national space projects can be in conflict; the laws of one can conflict with the policies of another.

Private investors and managers of risk seek environments that are predictable; silence and conflict on legal issues creates uncertainty, hesitation, and doubt.<sup>4</sup> Despite its shortfalls, the treaty regime does not leave the more ambitious mercantile space participants entirely without the tools necessary to address the responsibilities and obligations imposed.

However, lacunae remain and I argue it is the contract itself that will facilitate doing responsible business in space. The proposed study will begin with a discussion of the contemporary business trends, relating them to the commercial space environment. An examination of the existing laws regulating space will follow, from the treaties, through domestic legislation, export controls, to private agreements.

Using the present state of Space Law as a point of departure, the study will identify some situations that have evolved in the years since treaty adoption which have created uncertainty, namely situations that do not fall neatly into any contemplated category of activity or relationship, or those that have served to impede commercial space activity. The work will also scrutinize the various methods employed by the private

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<sup>3</sup> Thomas L. Friedman, *The World is Flat* (1<sup>st</sup> Picador ed.) (New York: Picador, 2007) at 203, 208 – 09, 233; “We have gone from a vertical chain of command for value creation to a much more horizontal chain of command for value creation...How you collaborate horizontally and manage horizontally requires a totally different set of skills.” Carly Fiorina, former CEO of Hewlett Packard quoted in “Leadership Presence: Enabling Positive Transformation in the Global Economy” online : <[http://www.ecstasis.com/downloads/Leadership\\_Presence.pdf](http://www.ecstasis.com/downloads/Leadership_Presence.pdf)> (date accessed: 26 September 2008).

<sup>4</sup> “Certainty is so essential that law cannot even be just without it.” Francis Bacon.

sector to address the identified uncertainties and impediments relating to outer space activities.

The use of contracts between parties will prove to be one of, if not the, most viable tools to assure compliance and certainty. It is at this point that the work will explore the contract as it is evolving in the context of international commercial law and the space industry. Party autonomy in both common and civil law contexts will be discussed, as well as the feasibility of *lex mercatoria* as a facilitator of space commerce. Existing methods of dispute resolution will be explored, including arbitration, mediation, and the courts. A case study of a failed space transaction will illustrate how some of the tools discussed could have perhaps saved the deal.

Lastly, the work will make recommendations on how best to privately address the needs of the commercial space community and continue facilitation of responsible growth, using the tools currently available. Telecommunications, highly dependent upon space industry, has been likened to a public utility and infrastructure commodity, as have some of the developing uses for earth observation. It is of paramount importance that all mankind continue to benefit from the development of commercial space. To this end, my thesis offers practical solutions available now.



## **Chapter One**

### **The Commercial Space Environment**

“I’ll tell you what’s going on.”  
Marvin Gaye

While this chapter does not pretend to offer an exhaustive list of either the existing or potential businesses included in the realm of commercial space, or even the uncertainties those businesses face, it is intended to give the reader a sense of the realities the legal regime must address. First, it will discuss the components of the space industry and current market conditions., and it will end by addressing emerging trends including globalization and public-private partnerships.

To understand the legal milieu in which space related business presently operates, we must first define what that business includes. Commercial space activities encompass those occurring in outer space, as well as activities which take place on the ground both in the planning stages of a project and once placed in outer space. The pertinent activities involve launch vehicle manufacturing and services, satellite manufacturing, ground equipment manufacturing,<sup>5</sup> satellite services,<sup>6</sup> remote sensing,<sup>7</sup> distribution or transport of parts to and from manufacturing and launch sites, and support services such as risk management and financing. Taken further, the listed activities can be characterized as 1) accessory (services, distribution/transport), 2) principal (remote sensing,

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<sup>5</sup> This category would be comprised of all hardware, including gateways and satellite control stations, mobile uplink equipment, VSAT terminals, and consumer electronics. FAA/AST, *The Economic Impact of Commercial Space Transportation in the U.S. Economy* (April 2008) at 5.

<sup>6</sup> Satellite services include end user services such as telephony, VSAT (very small aperture terminal) services, satellite data services, DARS (digital audio radio services), and DTH (direct to home). Satellite data services include mobile data service like asset tracking and high speed internet services. Transponder leasing is also a satellite service and encompasses services offered by companies that operate satellites and lease or sell transponder capacity either for full-time or occasional use. *Ibid.*

<sup>7</sup> This category entails both the provision of raw data and imagery services. Ancillary business includes digital processing of this imagery and value-added products.

telecommunications, data broadcasting, space travel), 3) industrial (manufacturing), or 4) complementary (support).<sup>8</sup> From an insurer's perspective, commercial space activities "include any space activity which does not directly involve the [ ] Government as an insured... from 'cradle to grave'."<sup>9</sup> The Office of Commercial Space Transportation (AST) of the Federal Aviation Administration (FAA) in the United States defines commercial launch activities as either internationally competed launch events or launches licensed by the Office of Commercial Space Transportation under 49 United States Code Subtitle IX, Chapter 701.<sup>10</sup>

Telecommunications infrastructure has been widely recognized as a public service and earth observation as a public good.<sup>11</sup> These two applications represent the most fully developed commercial uses of outer space. Outer space systems use radio frequencies for research, earth observation (remote sensing), air navigation radio (surveillance and satellite positioning), telecommunications, radio broadcasts, broadband transmission, and space operations (shuttles and launches).<sup>12</sup>

### **Market Conditions**

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<sup>8</sup> Julian Hermida, *Commercial Space Law: International, national and contractual aspects* (Argentina: Quality Books, Inc., 1997) at 260 – 61. While Hermida does not include space travel in his list, his book was published in 1997. The ensuing twelve years have seen a dramatic sea change in perception regarding human spaceflight participants as opposed to astronauts.

<sup>9</sup> John W. Vinter. "The Future Markets for Commercial Space" (Testimony presented to the United States House of Representatives, 20 April 2005) online: <<http://www.spaceref.com/news/viewsr.html?pid=16253>>(date accessed: 15 March 2009).

<sup>10</sup> FAA/AST, Third Quarter 2008 Quarterly Launch Report at 1, online: <[http://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/media/3Q2008%20Quarterly%20Report.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ast/media/3Q2008%20Quarterly%20Report.pdf)>(date accessed: 24 September 2008).

<sup>11</sup> J.P. Singh, *Leapfrogging Development: The Political Economy of Telecommunications Restructuring* (Net Library 1999) at 19.; Gilberto Camara and Leonel Perondi "Making International Collaboration Work in Earth Observation: A View from Brazil", (May 2002) Earth Observation Business Network (EOBN) online: <[http://www.mundogeo.com.br/revistas-interna.php?id\\_noticia=5297&lang\\_id=3](http://www.mundogeo.com.br/revistas-interna.php?id_noticia=5297&lang_id=3)> (date accessed: 15 March 2009)..

<sup>12</sup> P.A. Salin, "Satellite Communications are the Object of Incomplete International Regulations Inherited from the Past" in *Satellite Communications Regulations in the Early 21st Century – Changes for a New Era*, UTRECHT STUDIES IN AIR AND SPACE LAW V. 19,( The Hague: KLUWER LAW INTERNATIONAL, 2001).

The number of different kinds of space businesses is increasing, as is the level of business within almost all segments. This is not surprising, considering the pervasive penetration of satellites into our daily lives via cell phones, direct-to-home broadcasting, the Internet and e-mail, global positioning (GPS), weather tracking, disaster relief efforts,<sup>13</sup> Google Earth and MapQuest.

The telecommunications sector is not only the most developed use of space, it continues to show evidence of the strongest growth, moving in to take market share from fiber networks since the early 2000's as a result of point-to-multipoint content distribution, reliability, accountability, and fast connection setup.<sup>14</sup> The most pronounced increases in 2007 were seen in manufacturing and services, and while other sectors did not experience as substantial growth, the trends for growth in these also remain stable. Only launch revenues showed a decrease in the same period; however, this can be attributed to a decrease in launch costs, rather than a slowdown in actual launches performed.<sup>15</sup> Although there were more NGSO (non-geosynchronous orbit) satellite launches in 2007 than in any recent year, this was largely due to replenishment and replacement of older NGSO satellites with next generation systems and international science satellites.<sup>16</sup>

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<sup>13</sup> Use of on board digital technology has enabled emergency services to share information more effectively during natural disasters. "Satellites aiding disaster relief" ESA Telecommunications, European Space Agency available online: <[http://www.esa.int/esaTE/SEM9K3VQUD\\_index\\_0.html](http://www.esa.int/esaTE/SEM9K3VQUD_index_0.html)> (date accessed: 12 March 2009).

<sup>14</sup> John C. Tanner, "Satellite on the rebound: satellite leaders are bullish on the industry's short-term prospects. Low investor confidence and over-regulation remain hurdles to recovery, but operators are eyeing new ways to capitalize on satellite's ability to go where fiber can't", online: <[http://findarticles.com/p/articles/mi\\_m0FGI/is\\_11\\_13/ai\\_94667515?tag=content;coll1](http://findarticles.com/p/articles/mi_m0FGI/is_11_13/ai_94667515?tag=content;coll1)> (date accessed: 15 March 2009).

<sup>15</sup> Futron Corporation, "Launch Report" (January 2008), online: Futron Corporation <[http://www.futron.com/pdf/friends\\_of\\_futron\\_reports/launch\\_reports/FutronLR2008-01.pdf](http://www.futron.com/pdf/friends_of_futron_reports/launch_reports/FutronLR2008-01.pdf)> (date accessed: 23 February 2008).

<sup>16</sup> FAA Commercial Space Transportation, "2007 Year in Review" (2008), online: FAA/AST <[http://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/media/2007\\_Year\\_In\\_Review\\_Jan\\_2008.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ast/media/2007_Year_In_Review_Jan_2008.pdf)>

Satellite television drove much of the market growth.<sup>17</sup> HDTV (high definition television) channels are expected to grow another 600% over the next five years, with an annual growth of 35%.<sup>18</sup> It appears that the expansion has exceeded recovery/rebound levels after the downturns experienced in 2002 and can be attributed to a number of factors including increasing demand for bundled applications in developing countries, demand for greater geographic penetration in all markets, increased requirements for enhanced products and applications in emerging markets, and changing regulatory schemes in key markets like India.<sup>19</sup>

Similar to satellite services, the manufacturing side shows expansion, although in subtler fashion. Satellite manufacturers suffer from pressure to lower prices and revenues marginally decreased in 2007, but strong demand for broadcasting, broadband and mobile satellite services have consistently driven an increase in orders, projected to continue through 2013.<sup>20</sup>

Commercial users have enlarged the range of applications for satellite images. American commercial satellite imagery firms DigitalGlobe and GeoEye are partnering with the U.S. Geological Survey in support of the myriad space and satellite agencies across the globe that constitute the International Charter on “Space and Major

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> (date accessed: 23 February 2008), at 15. While the US Office of Commercial Space Transportation expects that demand for the more lucrative GEO (geosynchronous orbit) communications satellites will experience limited growth going forward, with a near-term trend of heavier GEO satellites and a decline of satellites under 2,200 kilograms (4,850 pounds) as the industry continues to change, the Satellite Industry Association has noted an increase in the number of micro-satellites launched in 2007. Futron, *supra* note 15 at 7.

<sup>17</sup> Futron, *supra* note 15 at 10.

<sup>18</sup> *Ibid.* at 22.

<sup>19</sup> *Ibid.* at 23.

<sup>20</sup> Michael A. Taverna and Robert Wall, “Pick and Choose: Buoyant demand and improving outlook seen for telecom satellite manufacturers” *Aviation Week & Space Technology* (10 September 2007) 28. The higher proportion of micro-satellites, or payloads weighing 50 kg or less, has been cited as a cause for the decline in revenue despite the nearly flat number of launches. Futron, *supra* note 15 at 13.

Disasters.”<sup>21</sup> Google Earth used imagery in a recreational context -- creating online interactive 3D environments in virtual worlds like Second Life,<sup>22</sup> as well as to highlight human rights atrocities in Darfur.<sup>23</sup>

Also on the commercial satellite imagery front, higher resolution imaging is becoming increasingly accessible. The launch of DigitalGlobe WorldView-1 spacecraft means that DOD-sponsored (US Department of Defense) commercially available imagery will be comparable to recent highly classified imagery produced by National Reconnaissance Office systems. This is the first part of DOD’s NextView program, combining commercial remote sensing with much more powerful optics partly funded by the Pentagon.<sup>24</sup> Google and Spot Image entered into an agreement which improved the resolution of imagery available for Google Earth users. Spot Image, headquartered in France, will provide 2.5 meter resolution for extensive areas of Earth.<sup>25</sup> TerraSar-X, the German radar satellite launched in June 2007, offers the first commercial one-meter resolution imaging.<sup>26</sup>

The North American market, always the pioneer for new applications, is promoting a new concept, Ancillary Terrestrial Components, to facilitate a pervasive hybrid satellite/terrestrial network, the latest development on the mobile satellites

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<sup>21</sup> International Charter on Space and Major Disasters online:

<[http://www.disasterscharter.org/about\\_e.html](http://www.disasterscharter.org/about_e.html)>(date accessed: 15 March 2009).

<sup>22</sup> Daniel Terdiman, “Google tools to power virtual worlds” CNET News online:<

[http://news.cnet.com/Google-tools-to-power-virtual-worlds/2100-1043\\_3-6212325.html](http://news.cnet.com/Google-tools-to-power-virtual-worlds/2100-1043_3-6212325.html)>(date accessed: 15 March 2009).

<sup>23</sup> Elise Labott, “Google Earth maps out Darfur atrocities,” CNN (15 April 2007), online: CNN.com <<http://www.cnn.com/2007/TECH/04/10/google.genocide/index.html>> (date accessed: 24 February 2008).

<sup>24</sup> Anne Flaherty “U.S. plans next-gen spy satellite program” MSNBC online:<

<http://www.msnbc.msn.com/id/22046019/>>(date accessed: 15 March 2009).

<sup>25</sup> “Google delivers higher resolution on Google Earth through agreement with French Spot Image” (22 January 2007) online : <http://www.spotimage.fr/web/en/1270-google-delivers-higher-resolution-on-google-earth-through-agreement-with-french-spot-image.php> (date accessed: 12 March 2008).

<sup>26</sup>“ Infoterra GMBH Initiates Commercial Exploitation of TerraSar-X ” online :

<[http://www.gisdevelopment.net/technology/sar/me05\\_062pf.htm](http://www.gisdevelopment.net/technology/sar/me05_062pf.htm)> (date accessed : 12 March 2007).

services front.<sup>27</sup> And, laser beams are garnering interest as a cost-effective alternative to radio waves for the transmission of large quantities of data over long distance through space because they can transmit high rates of data with little power consumption and low payload weight.<sup>28</sup>

As for what is happening in the rest of the world, India bolstered its presence in commercial space markets with a strong role selling remote sensing images to other countries. As of September 2007, India claimed to have captured 20% of the global market.<sup>29</sup> India launched Cartosat II, with one meter resolution, in January 2007, bringing Indian imagery in line with the Ikonos of the United States.<sup>30</sup>

The Indian Space Research Organization (ISRO) and an aggregate of Asian/Middle East manufacturers, new entrants in the commercial space sector, showed the greatest increase in market share of satellites launched in 2007 (gaining an additional 4%); India's first commercial launch in 2007 was followed by its second in January 2008, when it successfully completed the launch of an Israeli spy satellite.<sup>31</sup> Affirming India's increasing importance as a soft power,<sup>32</sup> an Aerospace Industries Association (AIA)

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<sup>27</sup> Nick Mitsis "Ancillary Terrestrial Components: Spark New Hope for the MSS Market" *Satellite Today* online:< [http://www.satellitetoday.com/via/features/Ancillary-Terrestrial-Components-Spark-New-Hope-For-The-MSS-Market\\_183.html](http://www.satellitetoday.com/via/features/Ancillary-Terrestrial-Components-Spark-New-Hope-For-The-MSS-Market_183.html)> (date accessed: 15 March 2009).

<sup>28</sup> *Ibid.*

<sup>29</sup> T.S. Subramanian, "ISRO entrenched in remote-sensing images market" *The Hindu* (23 September 2007) online : < <http://www.hindu.com/2007/09/23/stories/2007092360451200.htm>> (date accessed : 12 March 2008).

<sup>30</sup> Wg Cdr Ajey Lele, "Space Programme: Adding to India's brand image" *India Strategic* (July 2007) online:<<http://www.indiastrategic.in/topstories23.htm>> (date accessed: 12 March 2008).

<sup>31</sup> Israel Ashdod, "More than Money – IAI Critical to Israel's Defense, Says Peres and Upcoming Launch" *Sat News Daily* online: <[http://www.satnews.com/cgi-bin/display\\_story.cgi?number=1338907555](http://www.satnews.com/cgi-bin/display_story.cgi?number=1338907555)> (date accessed 12 March 2008).

<sup>32</sup>

Soft power is a term used in international relations theory to describe the ability of a political body, such as a state, to indirectly influence the behavior or interests of other political bodies through cultural or ideological means. The term was first coined by Harvard University professor Joseph Nye, who remains its most prominent proponent, in a 1990 book, *Bound to Lead: The Changing Nature of American Power*. He further developed the concept in his 2004 book, *Soft Power: The Means to Success in World Politics*. Its usefulness as a descriptive theory has been

survey showed that more than 86% of US civil and military aerospace contractors plan to sign agreements to form joint ventures or partnerships with small Indian aerospace companies in the next year.<sup>33</sup> India is seeking international partners for its space industry.<sup>34</sup> Likewise, ESA (European Space Agency) has expressed a desire to outsource to India sub-systems and components for space missions to leverage cost benefits and reliable Indian research, but cannot because of constraints under ESA's rules.<sup>35</sup>

Japan entered the commercial launch game via Mitsubishi Heavy Industries and is aggressively seeking commercial customers to augment its list of government launches. One private launch per year is the current target.<sup>36</sup> In addition, the Japan Aerospace Exploration Agency (JAXA) accepted applications for commercial use of its section on the International Space Station (ISS), launched in May 2008 and successfully attached in June.<sup>37</sup> JAXA seeks only to recover the direct cost of experiments with no rent for space; the first experiment began by the first quarter of 2009, and a second is scheduled to commence between the latter half of 2009 and March 2010.<sup>38</sup>

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challenged often, but soft power is still being used as a term that distinguishes the subtle effects of culture, values, and ideas on others' behavior from more direct coercive measures called hard power such as military action or economic incentives.

Online:<[http://en.wikipedia.org/wiki/Soft\\_power](http://en.wikipedia.org/wiki/Soft_power)> (date accessed: 24 September 2008).

<sup>33</sup> Caitlin Harrington, "US aerospace industry seeks Indian partnerships" *Janes Defence News* (3 Jan 2007)

<sup>33</sup> Frank Morring, Jr., ed., "In Orbit: Open for Business" *Aviation Week & Space Technology* (2 April 2007) 19.

<sup>34</sup> *Ibid.*

<sup>35</sup> "European space agencies keen on outsourcing to India" *India News* (27 September 2007)

online:<[http://www.monstersandcritics.com/news/india/news/article\\_1360211.php/European\\_space\\_agencies\\_keen\\_on\\_outsourcing\\_work\\_to\\_India](http://www.monstersandcritics.com/news/india/news/article_1360211.php/European_space_agencies_keen_on_outsourcing_work_to_India)>(date accessed: 15 March 2009).

<sup>36</sup> "Mitsubishi Heavy aims to reduce launch costs – company," *Space Travel* (7 January 2008), online: *Space Travel* <[http://www.space-travel.com/reports/Japans\\_Mitsubishi\\_Heavy\\_aims\\_to\\_cut\\_rocket\\_launch\\_costs\\_company\\_999.html](http://www.space-travel.com/reports/Japans_Mitsubishi_Heavy_aims_to_cut_rocket_launch_costs_company_999.html)> (date accessed: 24 February 2008).

<sup>37</sup> *Ibid.*; FAA Commercial Space Transportation, "Third Quarter Report" (2008) online:<[http://www.faa.gov/about/office\\_org/headquarters\\_offices/ast/media/3Q2008%20Quarterly%20Report.pdf](http://www.faa.gov/about/office_org/headquarters_offices/ast/media/3Q2008%20Quarterly%20Report.pdf)>(date accessed: 15 March 2009) at 3.

<sup>38</sup> online:<<http://kibo.jaxa.jp/en/about/>>(date accessed: 15 March 2009); "Japanese Experiment Module" online:<[http://en.wikipedia.org/wiki/Japanese\\_Experiment\\_Module](http://en.wikipedia.org/wiki/Japanese_Experiment_Module)>(date accessed: 12 March 2009).

Brazil and Argentina teamed up for a successful joint space launch, the first commercial launch of a Brazilian rocket.<sup>39</sup> Brazil also entered into a partnership with the Ukraine, forming a joint venture company for rockets and satellites to be launched from the Alcantara Base in the northeastern Brazilian state of Maranhao. It will use already proven Ukrainian launch technology. The commercial venture hopes to capture approximately 10% of the global market in the next eight years, marketing itself to countries with satellites, but without launch capability.<sup>40</sup> In addition, Brazil and China partnered in an imaging satellite, launched in September 2007, and provided images to Africa at no cost.<sup>41</sup>

China announced its plans to vie for future business in the international satellite launch, sales, and service markets.<sup>42</sup> Additionally, China launched two GEO satellites that will provide commercial communications services as well as a Nigerian communications satellite, and entered into a commercial partnership with mobile satellite handheld service provider Thuraya.<sup>43</sup> With no US components, China is marketing its satellites as ITAR-free at prices far below industry standard,<sup>44</sup> a reality that spurred

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<sup>39</sup> “Brazil, Argentina successfully complete joint space launch” (17 December 2007) online: The Earth Times <<http://www.earthtimes.org/articles/show/159845.html>> (date accessed: 13 March 2008).

<sup>40</sup> *Ibid.*

<sup>41</sup> “Launch of China-Brazil Earth Resources Satellite CBERS 2-B (17 September 2007) online: <[http://www.brazil.org.uk/newsandmedia/pressreleases\\_files/20070917.html](http://www.brazil.org.uk/newsandmedia/pressreleases_files/20070917.html)> (date accessed: 15 March 2009).;

[http://www.spacemart.com/reports/China\\_Brazil\\_give\\_Africa\\_free\\_satellite\\_land\\_images\\_999.html](http://www.spacemart.com/reports/China_Brazil_give_Africa_free_satellite_land_images_999.html).

<sup>42</sup> Email from [space\\_sanctuary@yahoo.com](mailto:space_sanctuary@yahoo.com) to Theresa Hitchens of 20 Nov 2007; Wendell Minnick, “China Finds Growth in Leninist Tack to Aerospace” *DefenseNews* (20 August 2007) 16.

<sup>43</sup> AST report, *supra* note 16 at 11; “China launches satellite for Nigeria” *Associated Press* (14 May 2007) online: <<http://msnbc.msn.com/id/18654107/>> (date accessed: 13 March 2008); Thuraya Satellite Communication Company, News Release/Communique, “Thuraya signs commercial partnership in China” (22 April 2007), online: <<http://www.thuraya.com/content/thuraya-signs-commercial-partnership-in-china.html>> (date accessed: 13 March 2008).

<sup>44</sup> ITARs, or US International Traffic in Arms Regulations, will be discussed in further detail *infra*, both in this section and in Chapter Four.



French launch company Arianespace to call for vigilance against Chinese dumping.<sup>45</sup> Additionally, Korea is developing a small launch vehicle, the Korea Space Launch Vehicle, which appears to signal Korea's entrance into the commercial launch services market.<sup>46</sup>

## **Trends**

As the foregoing demonstrates, it is clear that space business is global, and subject to the forces at work creating a global economy.<sup>47</sup> The idea that economies are interconnected has achieved enough critical mass that the World Bank publishes pertinent information regarding this interdependence on its website.<sup>48</sup> The financial crisis of September/October 2008 is affecting markets around the world. The space industry will probably be affected by government cost-cutting measures.<sup>49</sup> While difficulty in obtaining credit will likely impact the commercial space sector and result in reduced revenue and layoffs,<sup>50</sup> the globalization inherent in space business appears to provide a cushion from the blows felt by many other industries.<sup>51</sup> In the United States, the

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<sup>45</sup> "Arianespace warns US over Chinese space 'dumping'" (30 November 2007) online: <http://afp.google.com/article/ALeqM5gRSPI2HxWsPwjfICbGanIw4VN0SQ> (date accessed: 12 March 2007).

<sup>46</sup> AST report, *supra* note 16 at 15.

<sup>47</sup> Henry R. Hertzfeld, "Globalization, commercial space and spacepower in the USA" *Space Policy* 23 (2007) 210-220 at 212.

<sup>48</sup> The World Bank online:

<<http://web.worldbank.org/WBSITE/EXTERNAL/EXTDEC/EXTDECPROSPECTS/EXTGBLPROSPEC> TSAPRIL/0,,menuPK:659178~pagePK:64218926~piPK:64218953~theSitePK:659149,00.html> (date accessed: 25 September 2008>).

<sup>49</sup> While space industries are not part of the US bailout program, President Obama's budget plan does increase NASA's budget by 5% as part of a five-year plan that includes funds for global climate change research and continues the prior administration's commitment to retirement of the space shuttle in 2010 and return to the Moon by 2020. Becky Iannotta "Obama Budget Plan Offers Near-Term Boost for NASA" *Space News* (2 March 2009) Volume 20 Issue 9 at 1.

<sup>50</sup> Jeff Foust "Space and the financial crisis" *The Space Review* (20 October 2008) online: <<http://www.thespacereview.com/article/1236/1>>(date accessed: 6 February 2009).

<sup>51</sup> The top three commercial satellite fleet operators in the world (SES of Luxembourg, Intelsat of Bermuda and Eutelsat of Paris) appear to be thriving in spite of the global financial crisis. Two of them reported high occupancy of their fleets continued near term demand. All three are maintaining or accelerating satellite replacement and expansion programs. Most revenue comes from television broadcasting. Peter B.

depreciation of the dollar made exports more affordable to purchasers from other countries and sales of commercial satellites and launch services showed growth in 2008.<sup>52</sup>

The paradigm shift engendered by globalization is fundamental and can be seen in the way in which individuals, as well as businesses and states, relate to the world at large. Where globalization once primarily referred to transcendence of national borders to achieve some end, be it economic or cultural or political, at this particular juncture in time the interconnectedness of the entire market place reaches into supply chain infrastructure and distribution strategies.

In his book, *The World is Flat*, Thomas L. Friedman credits the dot-com bust as a driver of globalization, forcing companies to outsource and offshore to survive in its aftermath.<sup>53</sup> No matter the reason, the result is a dramatic change in how we all communicate with one another, through email on PDAs, social utilities such as FaceBook, and VoIP (voice over Internet protocol), much of which is driven by satellites in space. Furthermore, businesses function differently, creating horizontal global supply chains and interacting in real-time for asset tracking and inventory replenishment.

This shift has been described as a transition from a top-down, vertical, or command-control model to one that is collaborative and horizontal.<sup>54</sup> Collaboration is

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de Selding "SES, Intelsat and Eutelsat Thriving Despite Global Economic Downturn" Space News Volume 20 Issue 7 (16 February 2009) at 1.

<sup>52</sup> "2008 Year End Review and 2009 Forecast – An Analysis" AIA Research Center,, online: <<http://www.aia-aerospace.org/pdf/2008-year-end-report.pdf>>(date accessed: 6 February 2009).

<sup>53</sup> Friedman, *supra* note 3, at 229.

<sup>54</sup> *Ibid.* at 203, 208 – 09, 233; "We have gone from a vertical chain of command for value creation to a much more horizontal chain of command for value creation...How you collaborate horizontally and manage horizontally requires a totally different set of skills." Carly Fiorina, former CEO of Hewlett Packard quoted in "Leadership Presence: Enabling Positive Transformation in the Global Economy", online: <[http://www.ecstasis.com/downloads/Leadership\\_Presence.pdf](http://www.ecstasis.com/downloads/Leadership_Presence.pdf)>(date accessed: 26 September 2008). Actually, international law has been characterized as a "horizontal conception of law" as a legal or

apparent in the manner in which civilian space agencies approach ventures. A recent RFI (request for information) released by NASA solicits information from the private space industry, both in the US and the international community, regarding the level of ability and interest with respect to commercial co-development of lunar communications and navigations systems.<sup>55</sup> While international collaboration has factored into space exploration and exploitation since the days before the establishment of the International Geophysical Year in the early 1950's,<sup>56</sup> it is more pronounced today. Earth observation is an example of a current application of the "horizontal integration paradigm" to an existing and contemplated infrastructure in order to create interoperable observation, information, and decision support systems.<sup>57</sup>

It must be acknowledged that the global market economy, and globalization itself, are not without detractors. In an interview by Scott London, critic Jerry Mander expressed his views that the push for continued growth and belief in the viability of free-market economy driving the current trend for globalization will ultimately hit a wall and fail.<sup>58</sup> Websites exist that challenge students to question the efficacy of globalization.<sup>59</sup>

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quasi-legal system of international anarchy, and the new more liberal relations between state and non-state actors as a challenge to the hierarchy between states. J.H.H. Weiler & Andreas L. Paulus "The Structure of Change in International Law or Is There a Hierarchy of Norms in International Law?" found within *Symposium: The Changing Structure of International Law Revisited (Part 2)* 8:3 EJIL (1997) 545, 560.

<sup>55</sup> "Commercial Lunar Communications and Navigation Request for Study Information", online:<<http://www.spaceref.com/news/viewsr.html>>(date accessed: 3 September 2008).

<sup>56</sup> J.L. Culhane, J.C. Worms, *Improving the effectiveness of international collaboration in space science* Space Policy 17 (2001) 179 – 186, 179.

<sup>57</sup> "The Application of a Horizontal Integration Paradigm for GEOSS", online: <<http://ieeexplore.ieee.org/iel5/10733/33856/01612459.pdf?arnumber=1612459>>(date accessed: 26 September 2008).

<sup>58</sup> Interview of Jerry Mander by Scott London, online: <<http://www.scottlondon.com/interviews/mander1.html>>(date accessed: 26 September 2008). Jerry Mander is best known for his book *Four Arguments against Television* and is an outspoken critic of globalization.

<sup>59</sup> "A student's guide to globalization" online:<<http://www.globalization101.org/>>(date accessed: 26 September 2008).

There are those who proselytize the benefits of a simpler life,<sup>60</sup> or decry global markets as homogenizing many small cultures into one “mono-culture.”<sup>61</sup>

Space business is not only subject to the new reality of globalization, it facilitates it through the technology it delivers to people around the globe. That said, the space industry does not really differ from international commerce in general, save for the treaty requirements to be described in the next chapter. It is precisely because of its similarities to other contemporary transnational businesses that in Chapter Four I posit that commercial space ventures can and should use the tools already used successfully in the “new, new *lex mercatoria*,”<sup>62</sup> subject to the limitations imposed by the treaty regime.

Space companies have consolidated and launches are competed internationally, creating a global marketplace. Market conditions have driven some of the trend; in space, satellite manufacturers moved to consolidate when confronted with a glut of inventory and declining demand in the early years of the millennium.<sup>63</sup> Another

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<sup>60</sup> Herztfeld, *supra* note 47 at 213.

<sup>61</sup> London, *supra* note 58.

<sup>62</sup> The “new new *lex mercatoria*,” has been described as moving “from an amorphous and flexible soft law to an established system of law with codified legal rules (first and foremost the UNIDROIT Principles of International and Commercial Law) and strongly institutionalized court-like international arbitration.” Ralf Michaels, “The True Lex Mercatoria: Law Beyond the State” 14:2 *Indiana Journal of Global Studies* 447, 448 (Summer 2007).

<sup>63</sup> Futron, *supra* note 15 at 7. The decline of the nineties and early 2000’s is on the rebound. *See also* . DRAFT Commercial Space Industry and Markets: A Critical Space Power Consideration, Futron Corp. for Nat’l Defense University, Space Power Theory Vol. 2 (8 January 2007) at 4 “Satellite builders’ tough times: market downturn revives talk of consolidation on both sides of the Atlantic”, *Interavia Business & Technology* 1 Mar 2002. In 2007 alone, Aurora Flight Sciences acquired Payload Systems Inc., Alliant Techsystems acquired Swales Aerospace, Loral Space & Communications and Canada’s Public Sector Pension Investment Board acquired Telesat, and Telenor Satellite Services merged with France Telecom Mobile Satellite Communications to become Vizada. “Aurora acquires Payload Systems Inc.” press release online: <<http://www.aurora.aero/Communications/Item.aspx?id=apr-200>>(date accessed: 24 September 2008); “ATK completes the acquisition of Swales Aerospace” Press release online: <<http://news.thomasnet.com/companystory/522085>>(date accessed: 24 September 2008); Narayan Bhat “Loral Space completes Telesat Canada acquisition” TMCnet online: <<http://internetcommunications.tmcnet.com/topics/broadband-mobile/articles/13765-loral-space-completes-telesat-canada-acquisition.htm>>(date accessed: 24 September 2008); “Apax Partners Acquires Telenor Satellite Services and Integrates the Company into Vizada” *Business Wire* online: <[http://www.businesswire.com/portal/site/google/index.jsp?ndmViewId=news\\_view&newsId=200709060](http://www.businesswire.com/portal/site/google/index.jsp?ndmViewId=news_view&newsId=200709060)

emerging trend shows key players forming strategic partnerships, as with DirectTV partnering with Verizon in some markets, and AT&T in others, to offer more creative product packages to different market segments.<sup>64</sup>

Some space companies have stakeholders from multiple states. Sea Launch and Land Launch are examples of multinational firms in commercial space.<sup>65</sup> Sea Launch is a limited liability corporation, headquartered in Long Beach, California, also the home port of its vessel. The concept is simple. Because launch from the equator allows the most efficient trajectory into geostationary earth orbit (GEO),<sup>66</sup> as well as far less exposure to third party liability since launches from the middle of the ocean are far from people, places and things, the costs to launch are significantly lower. Sea Launch's ownership is apportioned as follows: Boeing (US) 40%, RSC Energia (Russia) 25%, Aker ASA (Norway) 20%, and SDO Yuzhnoye/PO Yuzhmash (Ukraine) 15%.<sup>67</sup> Financing is through a US bank, Chase Manhattan in New York.

Each partner has a different operational role; Boeing provides the payload faring, spacecraft integration, and manages the operation. RSC Energia provides the upper stage, launch vehicle integration support and has a role in operations. The Ukrainians provide the Zenit-3SL stages for the launch vehicle and participate in integration of the

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05320&newsLang=en>(date accessed: 24 September 2008). In 2008, EADS Astrium purchased a majority stake in Surrey Satellite Technology Ltd. AST 3Q Report, *supra* note 10 at 2.

<sup>64</sup> Futron, *supra* note 15 at 25.

<sup>65</sup> The AST classifies Sea Launch as a multi-national company in its yearly review of commercial space transportation. AST 2008 report, *supra* note 16 at 1.

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Geostationary earth orbit(GEO) is 22,282 miles above the equator. The orbit is important because it allows a satellite to orbit the earth at a fixed location in relation to the earth. From GEO, three satellites can cover all but the polar regions and transmissions can be received through fixed antennas. Traditionally satellites have been given two degrees of separation, which means only 180 satellites could be parked in the orbit.

Online:< <http://iml.jou.ufl.edu/projects/fall99/coffey/GEO.HTM> >(date accessed: 112 March 2009>.

<sup>67</sup> www.boeing.com, online: <<http://www.boeing.com/special/sea-launch/organization.htm>>(date accessed: 26 September 2008).

launches and, lastly, the Norwegian partner, while not performing ongoing operations, provided construction and conversion services to transform the Sea Launch Commander from its past life as an oil rig.<sup>68</sup> Land Launch has the same principals and uses the same launch technology as Sea Launch, but will be launching from Baikonur in Kazakhstan rather than at sea.<sup>69</sup> Originally scheduled to begin launching early in 2009, Land Launch already successfully launched its first communications satellite for an Israeli company, Spacecom, in April 2008.<sup>70</sup>

Entrepreneurial, less industry-entrenched companies are entering the commercial space arena, representing “New Space.” These businesses tackle projects that once populated the science fiction realm but now represent not just accessible reality but some of the greatest upside potential in space. They include XCOR Aerospace and Armadillo Aerospace, who won contracts to design and analyze rocket powered vehicles that could reach 200,000 feet and supersonic speeds.<sup>71</sup> The trend of investment in New Space is by individuals who have amassed personal wealth in non-related industries, such as Amazon founder Jeff Bezos who is advertising for engineers to join his privately-funded space

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<sup>68</sup>*Ibid.*

<sup>69</sup>News release online:<[http://www.boeing.com/special/sea-launch/news\\_releases/nr\\_070611.html](http://www.boeing.com/special/sea-launch/news_releases/nr_070611.html)> (date accessed: 26 September 2008). Land Launch is a subsidiary of Sea Launch.

Land Launch contracts will be managed by the existing Sea Launch organization in Long Beach, California. Such co-location and shared use of resources and personnel is key to enabling Land Launch to provide a “western” interface to its customers that is comparable to that experienced with Sea Launch. Launch services out of Baikonur are obtained via subcontract from Sea Launch to Space International Services, Ltd (SIS). SIS is a limited liability company based in Moscow consisting of key Land Launch members from Ukraine and Russia, all of which also participate in Sea Launch missions.

Online:<[http://www.boeing.com/special/sea-launch/customers\\_webpage/ll-users-guide/pdfs/1-Introduction.pdf](http://www.boeing.com/special/sea-launch/customers_webpage/ll-users-guide/pdfs/1-Introduction.pdf)>(date accessed: 12 March 2009).

<sup>70</sup> Online:<<http://www.boeing.com/special/sea-launch/land-launch/index.html#missions>>(date accessed: 12 March 2009).

<sup>71</sup> XCOR Presentation, Terrestrial Musings online:<[http://www.transterrestrial.com/archives/2008/03/xcor\\_presentati.html](http://www.transterrestrial.com/archives/2008/03/xcor_presentati.html)>(date accessed: 15 March 2009); “Space Startup Scorecard 2009” Digital Sprocket: Space and technology news and commenrary online:< <http://sabletower.wordpress.com/category/armadillo-aerospace/>>(date accessed: 15 March 2009)>.

program. His new company, Blue Origin 9, is focusing on human space exploration and affordable spaceflights for the masses.<sup>72</sup> Also involved in New Space is Elon Musk, founder of PayPal,<sup>73</sup> and his company SpaceX, developer of the Falcon series SLVs (satellite launch vehicles).

SpaceX has stated its goals are reduction of cost and increased reliability of both manned and unmanned space transportation by a factor of ten or more, with less than twenty-four hours notice.<sup>74</sup> In November, 2007 SpaceX broke ground at Space Launch Complex 40 at the Cape Canaveral Air Force Station in Florida, in a massive project upgrading and removing outdated infrastructure and transforming the site into a state of the art facility for commercial and governmental missions.<sup>75</sup> The United States Air Force granted the rights to operate.<sup>76</sup> SpaceX successfully launched the first entirely commercial rocket on its fourth try in September 2008.<sup>77</sup>

The soon-to-be-reality of commercial human spaceflight continues to generate excitement. To this end, the FAA implemented new guidelines to obtain experimental launch permits for reusable spacecraft, allowing personal spaceflight entrepreneurs

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<sup>72</sup> Online:<<http://public.blueorigin.com/index.html>>(date accessed: 15 March 2009).

<sup>73</sup> "PayPal is an e-commerce business allowing payments and money transfers to be made through the Internet. PayPal serves as an electronic alternative to traditional paper methods such as cheques and money orders." Online: <<http://en.wikipedia.org/wiki/PayPal>>(date accessed: 24 September 2008).

<sup>74</sup>"SpaceX Breaks Ground at Cape Canaveral's Space Launch Complex 40" Press Release (3 November 2007) online:< <http://www.comspacewatch.com/news/viewpr.html?pid=23951>>(date accessed: 15 March 2009); "Air Launch LLC Quick Reach Small Launch Vehicle Release (December 2007) online:<<http://www.airlaunchllc.com/AirLaunch%20QuickReach%20Fact%20Sheet%20-%20Updated.pdf>>(date accessed: 15 March 2009).

<sup>75</sup> "Space X Breaks Ground", *supra* note 74.

<sup>76</sup> "SpaceX Receives USAF Operational License for Cape Canaveral Launch Site" Press Release (9 September 2008) online:< <http://www.spaceref.com/news/viewpr.html?pid=26382> (date accessed: 15 March 2009).

<sup>77</sup> "SpaceX launches first commercial rocket "The Associated Press(29 September 2008) online: <[http://ap.google.com/article/ALeqM5iF-6npNsKa0n\\_7aLm8tJvuHWt4JgD93G1LC00](http://ap.google.com/article/ALeqM5iF-6npNsKa0n_7aLm8tJvuHWt4JgD93G1LC00)>(date accessed: 17 October 2008).

multiple vehicles of a specific design and unlimited launches of same per permit. The United States has projected a \$1 billion/year market for suborbital flights by 2021.<sup>78</sup>

Space Adventures is a company that is already marketing and selling space travel to the well-heeled.<sup>79</sup> Claiming a vision that “open[s] spaceflight and the space frontier to private citizens,” the company offers several different packages, ranging from suborbital flights with a view of the Earth to a visit to the ISS (International Space Station), including the possibility of booking a spacewalk. However, the retirement of the space shuttle in 2010 means that NASA will rely on the Soyuz vehicles to deliver astronauts to the ISS, decreasing the number of seats available for future commercial passengers.<sup>80</sup>

Spaceport America unveiled design renderings for its commercial spaceport center in Sierra County, 45 miles northeast of Las Cruces, New Mexico. The project is the first “purpose-built” commercial spaceport and is projected to stimulate as many as 5,000 new jobs and as much as \$1 billion in New Mexico. The spaceport will be home base for Richard Branson’s Virgin Galactic and is facilitated by a county Spaceport Tax, an example of a public-private partnership to be discussed later in this chapter.<sup>81</sup> When completed, the spaceport will house aircraft and spacecraft, as well as Virgin Galactic’s

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<sup>78</sup> Frank Morring, Jr., ed., “In Orbit: Commercial Flight” *Aviation Week & Space Technology* (16 April 2007) 22.

<sup>79</sup> Online:<<http://www.spaceadventures.com/>>(date accessed: 15 March 2009).

<sup>80</sup> This fact, plus the weakened US dollar, has boosted the cost of a ticket to the space station from \$20 – 25 million to \$30 – 40 million. “Space tourism tickets to skyrocket” MSNBC online:<<http://www.msnbc.msn.com/id/19834995/print/1/displaymode/1098/>>(date accessed: 15 March 2009).

<sup>81</sup> In April 2008 voters of Sierra County, New Mexico enthusiastically approved a sales tax increase to fund development of this spaceport, joining with their neighbors in adjoining Dona Ana County who had approved a similar tax provision in 2007. AST 3Q report, *supra* note 10 at 2.



operations facilities, including pre-flight and post-flight facilities, administrative offices and lounges.<sup>82</sup>

In its efforts at partnership with the aerospace industry and NASA, Florida, too, is positioning itself for a spaceport through a legislatively-created entity, Space Florida. The plans begin by marketing already-existing infrastructure at Kennedy Space Center for use by commercial companies such as SpaceX' build out of Space Launch Complex 40, and envision multiple spaceports throughout the state, supporting commercial space and personal spaceflight, as well as military and civil applications.<sup>83</sup>

Google lent its credibility to commercial space entrepreneurship when it signed on to sponsor the next X-Prize challenge, a \$30 million competition for the first team that can soft land a privately funded spacecraft on the Moon, travel a minimum distance of 500 meters and transmit high-definition video and other images and data back to Earth for viewing over the Internet.<sup>84</sup> Google has had eighteen teams enter the competition, two leave, and nearly 1500 requests for information from potential teams.<sup>85</sup>

Yet another interesting development is in the works at Bigelow Aerospace (BA), a company started by hotelier Bob Bigelow. BA is planning commercial inflatable

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<sup>82</sup> [www.spaceportamerica.com online: http://www.spaceportamerica.com/news/press-releases.html](http://www.spaceportamerica.com/news/press-releases.html) (date accessed: 15 March 2009); Leonard David "Spaceport America: First Looks at a New Terminal" online: [http://www.space.com/business/technology/070904\\_virgingalactic\\_spaceport.html](http://www.space.com/business/technology/070904_virgingalactic_spaceport.html) (date accessed: 15 March 2009).

<sup>83</sup> Space Florida Strategic Business Plan (31 March 2007) online: [http://www.spaceflorida.gov/docs/Strategic\\_Business\\_Plan-2007-2.pdf](http://www.spaceflorida.gov/docs/Strategic_Business_Plan-2007-2.pdf) (date accessed: 15 March 2009) at 13.

<sup>84</sup> <http://www.googlelunarprize.org/lunar/about-the-prize> . If the challenge is not met by December 31, 2012 the prize value drops to \$15M until December 31, 2014, at which time it will be terminated unless extended by Google and the X Prize Foundation. Guy Norris, "Google Moon: X Prize Foundation and Google offer \$30 million to land robots on the Moon" *Aviation Week & Space Technology* (17 September 2007) 67.. Sergey Brin, one of Google's co-founders, put down a hefty \$5M US deposit on a future flight to the ISS and membership in the company's Orbital Mission Explorers Circle which will give him preferential access to future commercial flights to the ISS. 3Q AST report, *supra* note 10 at 3.

<sup>85</sup> [www.googlelunarprize.org](http://www.googlelunarprize.org) online: <http://www.googlelunarprize.org/> (date accessed: 24 September 2008).

manned space modules or habitats, and intends to have three large multi-module stations in Earth orbit by 2015.<sup>86</sup> The first outpost could be host to twelve to fourteen commercial launch vehicles in its first year, slated to be 2012, and could signal major growth for Cape Canaveral/Kennedy Space Center. Use of the vehicles resulting from NASA's COTS competition is contemplated.<sup>87</sup> Bigelow projects that user crews would primarily consist of industry workers, and would not be space hotels although some tourist use could occur.<sup>88</sup> Bigelow set the price for sovereign customers (nations wanting to send their astronauts into space) at \$14.95M US for four weeks in the inflatable module, with the possibility to extend for \$2.95M US for each additional four weeks. Private companies will be able to lease the module for private industrial research for \$88M US/year for a full module and \$4.5M US/month for half a module. Bigelow will provide basic life support and electrical power at a pre-determined level with additional charges to customers for special outfitting.<sup>89</sup>

In Europe, the European Space Agency (ESA) has developed a plan to market and sell the use of services, resources, and facilities on the International Space Station (ISS)

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<sup>86</sup> Craig Covault, "Bigelow Aims High: Entrepreneur reveals near-term plan for commercial manned space infrastructure" *Aviation Week & Space Technology* (9 April 2007) 24 – 25.

<sup>87</sup> The COTS program is NASA's \$500 million Commercial Orbital Transportation Services program, designed to spur private development of commercial spacecraft that can service the ISS. Frank Morring, Jr., ed., "In Orbit: Commercial Flight" *Aviation Week & Space Technology* (16 April 2007) 22.. The original program provided funded agreements to SpaceX and Rocketplane Kistler. "NASA Signs Commercial Space Transportation Agreements" NASA, News Release (18 June 2007) online: <[http://www.nasa.gov/home/hqnews/2007/jun/HQ\\_07138\\_COTS\\_3\\_Unfunded\\_SAAs.html](http://www.nasa.gov/home/hqnews/2007/jun/HQ_07138_COTS_3_Unfunded_SAAs.html)> (date accessed: 16 March 2009). Although SpaceX remains on track, Rocketplane Kistler was dropped from COTS for failing to meet financial milestones. "NASA to Open New Competition for Transportation Seed Money" NASA, News Release (18 October 2007) online: <[http://www.nasa.gov/home/hqnews/2007/oct/HQ\\_07228\\_COTS\\_competition.html](http://www.nasa.gov/home/hqnews/2007/oct/HQ_07228_COTS_competition.html)> (date accessed: 16 March 2009), David Bond, ed., "Washington Outlook: Seeding the Station" *Aviation Week & Space Technology* (22 October 2007) 25.

<sup>88</sup> Covault, *supra* note 86..

<sup>89</sup> Frank Morring, Jr., "Setting Prices" *Aviation Week & Space Technology* (16 April 2007) 36; David Shiga "Commercial space station to launch before 2010" (14 August 2007) online : NewScientistSpace <<http://space.newscientist.com/article.ns?id=dn12485&print=true>> (date accessed : 13 March 2008); "Bigelow and Lockheed Martin Converging on Terms for Launch Services" (5 February 2008) online : <[http://www.bigelow aerospace.com/news/?BA\\_And\\_Lckheed\\_Martin](http://www.bigelow aerospace.com/news/?BA_And_Lckheed_Martin)> (date accessed : 13 March 2008).

through a commercial agent network, Innova S.p.A.<sup>90</sup> ESA, too, has shown interest in personal spaceflight, performing a study assessing the commercial suborbital market, identifying hindrances to market development, and determining ways to achieve European entry into the marketplace.<sup>91</sup> EADS Astrium announced its intention to garner a piece of the suborbital market, hoping for subsidization from regional development funding.<sup>92</sup>

### **Public-Private Partnerships**

Also important to the space industry is the relationship between governments and private actors, and the resulting public-private partnerships. Whereas privatization is on a downward spiral,<sup>93</sup> public-private partnerships are now hailed as “the new paradigm for economic development in the 21<sup>st</sup> century...increasingly being used as a policy tool to transform the role of national and local governments in public service delivery, infrastructure development, poverty alleviation, capital market improvement, and

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<sup>90</sup> “Space Research for Europe’s materials and processes industry” Space for Business Newsletter (19 September 2007) ESA online: <[http://www.esa.int/esaHS/SEMV14NPQ5F\\_business\\_2.html](http://www.esa.int/esaHS/SEMV14NPQ5F_business_2.html)> (date accessed: 16 March 2009).

<sup>91</sup> “Survey of European Privately-Funded Vehicles for Commercial Human Space Flight” General Studies Programme, ESA online: <[http://www.esa.int/SPECIALS/GSP/SEMR2Q8ATME\\_0.html](http://www.esa.int/SPECIALS/GSP/SEMR2Q8ATME_0.html)> (date accessed: 16 March 2009).

<sup>92</sup> David Shiga, “Space hotel competition heats up” *Space* (13 August 2007) online: [www.newscientist.com](http://www.newscientist.com) <<http://www.newscientist.com/blog/space/2007/08/space-hotel-competition-heats-up.html>> (date accessed 13 March 2008); Peter B. de Selding “Europe Unveils Space Plane for Tourist Market” (13 June 2007) online: [www.space.com](http://www.space.com) <[http://www.space.com/business/technology/AstriumEadsweb\\_061307.html](http://www.space.com/business/technology/AstriumEadsweb_061307.html)> (date accessed: 13 March 2008).; “Astrium suborbital space vehicle design” online: <<http://hobbyspace.com/nucleus/index.php?catid=77&itemid=4001>> (date accessed: 16 March 2009).

<sup>93</sup> Jerome Donovan, “Don’t Want to Privatize? Then Corporatize (But Do it Right)” online: [www.IP3.org](http://www.ip3.org) [http://www.ip3.org/pub/2006\\_publication\\_006.htm](http://www.ip3.org/pub/2006_publication_006.htm) (date accessed 20 April 2008); Although privatization and public-private partnerships have often been used interchangeably in the US, this paper will treat the two as separate, discrete entities found at different points along the public ↔ private continuum, with privatization referring to the furthest point on the private side, and the PPP falling somewhere along the spectrum, depending on the one-off characteristics of each particular project.

governance around the world.”<sup>94</sup> This trend is global,<sup>95</sup> particularly in the European and Asian markets.<sup>96</sup>

The US military, heavily reliant on satellite communication, has publicly recognized the importance of the commercial sector in meeting capacity shortfalls.<sup>97</sup> The US Defense Information Systems Agency (DISA) intends to upgrade the Transformational Communications Architecture (TCA), serving the Department of Defense, intelligence community and NASA; the new version will expand the potential role of for COMSATCOM<sup>98</sup> and will leverage emerging commercial satellite capabilities.<sup>99</sup> The RFI (request for information) addressing this last appeared to open the door for satellite firms to sell directly to the Department of Defense.<sup>100</sup> “Commercial satellites meet 80 percent of the needs of troops in Afghanistan and Iraq, four times as much as during Operation Desert Storm 16 years ago,” said Rebecca Cowen-Hirsch, head of DISA SATCOM Teleport and Services.<sup>101</sup>

A key example of the shift in dynamic between commercial space and government space is NASA’s \$500 million Commercial Orbital Transportation Services program. In addition, NASA plans to give away half of its rack space on the ISS as an

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<sup>94</sup> Matthew L. Hensley, “About IP3: President’s Welcome”, online: [www.ip3.org <http://www.ip3.org/a\\_president.htm>](http://www.ip3.org/a_president.htm) (date accessed 20 April 2008).

<sup>95</sup> Jumoke Jagun, Isabel Marques de Esa, “The Role and Importance of Independent Advisors in PPP Transactions” online: [www.ip3.org <http://www.ip3.org/pdf/2006\\_publication\\_014.pdf>](http://www.ip3.org/pdf/2006_publication_014.pdf) (date accessed 20 April 2008).

<sup>96</sup> Jacques Cook, “US PPP Market on the Upswing: Some Thoughts from Abroad” online: [www.IP3.org <http://www.ip3.org/pdf/2007\\_publication\\_002.pdf>](http://www.IP3.org/pdf/2007_publication_002.pdf) (date accessed 20 April 2008).

<sup>97</sup> “Final Day of ISCe Stress Importance of Commercial Satellite Industry and Government Partnership” (8 June 2007) SatNews Daily online: <http://www.satnews.com/stories2007/4573/> (date accessed: 16 March 2009).

<sup>98</sup> COMSATCOM refers to commercial satellite communications.

<sup>99</sup> Mark A. Kellner, “Satellite Firms Could Sell Directly to DoD” *DefenseNews* (15 January 2007) 6.

<sup>100</sup> *Ibid.*

<sup>101</sup> *Ibid.*

incentive to participate in the COTS program,<sup>102</sup> and is shopping for commercial and military users of the Ares launch vehicles it is developing for the Constellation program.<sup>103</sup>

Boeing and Lockheed Martin combined forces to expand their joint venture, United Space Alliance, which was formed to operate NASA's shuttle fleet. The two companies are developing software packages designed to support human exploration of the Moon. The plan is to use information from NASA's 2008 Lunar Reconnaissance Orbiter in conjunction with lessons learned from past human spaceflight on the shuttle to design and market applications ranging from mission design to inventory control.<sup>104</sup>

Hosted payloads allow military payloads to hitch a ride on a commercial launch.<sup>105</sup> Another approach to more "bang for transport vehicle buck" and public/private synergy is Boeing's proposed LEO gas station or propellant depot to refill lunar-injection vehicle tanks, fill up NASA's new lander and deliver more efficient payloads to the Moon surface.<sup>106</sup>

In addition, recently the Pentagon partnered with Intelsat Ltd. and Cisco Systems Inc. to facilitate high-speed Internet access to military units not tied to a location.<sup>107</sup> The

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<sup>102</sup> Frank Moring, Jr., ed., "In Orbit: Commercial Flight" *Aviation Week & Space Technology* (16 April 2007) 22.

<sup>103</sup> Constellation is NASA's program to develop spacecraft and systems to transport personnel to the ISS after shuttle retirement, and to the Moon past that. "NASA to Realign Constellation Program Milestones" NASA, News Release online: <[http://www.nasa.gov/home/hqnews/2008/aug/HQ\\_08-205\\_Constellation\\_realignment.html](http://www.nasa.gov/home/hqnews/2008/aug/HQ_08-205_Constellation_realignment.html)> (date accessed: 25 September 2008).

<sup>104</sup> Moring, *supra* note 102.

<sup>105</sup> "Intelsat Hosted Payloads: A Briefing at the Navy Satcom Users Workshop" (6 June 2007) online: <[www.sia.org/ISCe2007Presentations/NavySatcomUserWorkshop/NS3/NS3BrownDon.ppt](http://www.sia.org/ISCe2007Presentations/NavySatcomUserWorkshop/NS3/NS3BrownDon.ppt)> (date accessed: 16 March 2009); *US Air Force tests 'hosted payloads' in space* 12 Sept 2008 *Janes Defence Weekly*.

<sup>106</sup> "Space Gas Station Would Blast Huge Payloads to the Moon" (27 September 2007) *Popular Mechanics*, online: <[http://www.popularmechanics.com/science/air\\_space/4224660.html](http://www.popularmechanics.com/science/air_space/4224660.html)> (date accessed: 16 March 2009).

<sup>107</sup> "Pentagon, Private Firms Set Satellite Partnership" by Andy Pasztor; *Wall Street Journal*, April 9, 2007 at 9.

initial cost will be borne by private investors and a private-equity fund, in the hopes that the military will make long-term commitments to support future technologies and new acquisition procedures. The application will be added to an Intelsat satellite already under construction. The project includes government monies for testing and evaluation, but allows the military to test the new hardware for a fraction of its cost if the project was contemplated as purely military.

Other examples of satellite operations that bridge the public/private divide include COSMO-SkyMed, TerraSar-X, Radarsat 2, and Skynet. COSMO-SkyMed, developed by Italy and France, is a joint program of the Italian space agency and the Italian Ministry of Defense and is the first of four planned to form a dual-use (military and civil) earth observation system.<sup>108</sup> TerraSar-X is a German radar satellite resulting from the partnership between the German Ministry of Education and Science, the German Aerospace Center, and a private company Astrium GmbH.<sup>109</sup> The mission's objectives are the provision of data for scientific research and applications, and the establishment of a commercial earth observation market and sustainable business.<sup>110</sup> RADARSAT-2 represents another earth observation collaboration, this one between the Canadian Space Agency and MacDonald, Dettwiler and Associates Ltd. (MDA).<sup>111</sup> Finally, Skynet 5 is a military telecommunications satellite that is owned by private company Paradigm Secure

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<sup>108</sup> Deagel.com online:<[http://www.deagel.com/C3ISTAR-Satellites/COSMO-SkyMed\\_a000256001.aspx](http://www.deagel.com/C3ISTAR-Satellites/COSMO-SkyMed_a000256001.aspx)>(date accessed: 16 March 2009); "SSC supports Italian earth observation satellite" (8 June 2007) Swedish Space Corporation online:<<http://www.rymdbolaget.se/?id=5104&cid=8496>>(date accessed: 16 March 2009).

<sup>109</sup> "TerraSar-X Hot and New" DLR online:<[http://wwwserv2.go.t-systems-sfr.com/tsx/start\\_en.htm](http://wwwserv2.go.t-systems-sfr.com/tsx/start_en.htm)>(date accessed: 16 March 2009).

<sup>110</sup> *Ibid.*

<sup>111</sup> Radarsat-2 Mission online:<<http://www.radarsat2.info/about/mission.asp>>(date accessed: 16 March 2009).

Communications, a subsidiary of Astrium, the space arm of Europe's EADS Astrium.<sup>112</sup> Recently, Virgin Galactic and the US National Oceanic and Atmospheric Administration (NOAA) announced its plans to partner. Virgin Galactic will carry a scientific kit aboard its suborbital rocket plane during test-flights to assist the agency in data collection on climate change.<sup>113</sup>

This chapter was intended to provide a sense of how intrinsic commercial space ventures are to individuals, businesses, and governments everywhere on our planet at this point in time. The next chapter examines the legal framework within which these endeavors must function and, hopefully, flourish.

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<sup>112</sup> Andrew Chuter, "New UK Milsat Follows Pattern of Private Ownership Defense Services" *Defense News* (21 May 2007) 16.

<sup>113</sup> Austin Modine, "Virgin Galactic to save planet from climate change: Keeping up with the Googlers" *Science* (30 September 2008).

## **Chapter Two**

### **Legal Context**

“We are all of us in the gutter  
But some of us are looking at the stars”

Chrissie Hynde, The Pretenders

#### **Sources of Law:**

All space endeavors, public and private, are subject to several layers of legal regulation.<sup>114</sup> The first layer derives from public international law itself – treaties and conventions, custom, general principles of law, and the writings of scholars.<sup>115</sup> The next layer is comprised of national legislation applicable to space, such as the United States Commercial Space Launch Amendments Act of 2004.<sup>116</sup> The United States leads the world with domestic legislation relating to outer space.<sup>117</sup> The third layer deals with issues such as licensing and export controls, and lastly, there are multi-cooperative efforts that affect space operations. Some of the latter are between states, such as the International Space Station, while others are between private actors, as in Sea Launch, or

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<sup>114</sup> N.M. Matte (ed.), *Space Activities and Emerging International Law*, Centre for Research in Air and Space Law (CRASL), McGill University, 1984, pp. 71 - 110.

<sup>115</sup> Article 38 of the Charter of the United Nations establishes the International Court of Justice as the principal judicial organ of the United Nations and provides:

1. The Court, whose function is to decide in accordance with international law such disputes as are submitted to it, 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 civilized 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 subsidiary means for the determination of rules of law.

<sup>116</sup> 49 USC 70101 *et. seq.*

<sup>117</sup> P.A. Salin, “An Overview of U.S. Commercial Space Legislation and Policies – Present and Future” 27 AIR & SPACE LAW 209 (2002).



between state and private actors as in public-private partnerships as described in the previous chapter.

There are five treaties in force applicable to outer space: the Outer Space Treaty (OST),<sup>118</sup> the Agreement on the Rescue of Astronauts,<sup>119</sup> the Convention on International Liability for Damage Caused by Space Objects,<sup>120</sup> the Convention on Registration of Objects Launched into Outer Space,<sup>121</sup> and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (the Moon Treaty).<sup>122</sup> Both Canada and the United States are parties to all but the Moon Treaty.<sup>123</sup> All five treaties were drafted by the Committee for the Peaceful Uses of Outer Space (COPUOS) in the United Nations.

### **United Nations, COPUOS, ITU and consensus**

COPUOS was the first United Nations Committee to adopt a consensus methodology.<sup>124</sup> COPUOS chose the consensus principle during the initial policy and law-making fora because of the pronounced division between the developed and the developing countries when dealing with space issues. Simply stated, the dichotomy in philosophy can be expressed as: “no money, no space program” vs. “outer space should

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<sup>118</sup> Ratified by 98 states, signed by an additional 27, Treaties, *supra* note 2.

<sup>119</sup> ratified by 90, signed by 24, with 1 acceptance of rights and obligations, *Ibid.*

<sup>120</sup> ratified by 86, signed by 24, with 3 acceptances of rights and obligations, *Ibid.*

<sup>121</sup> ratified by 51, signed by 4, with 2 acceptances of rights and obligations, *Ibid.*

<sup>122</sup> ratified by 13, signed by 4, *Ibid.*

<sup>123</sup> Treaty Signatures, United Nations Office for Outer Space Affairs, online:<<http://www.unoosa.org/oosatdb/showTreatySignatures.do>>(date accessed: 16 March 2009).

<sup>124</sup> To reach consensus, the committee discusses an issue until settled without putting it to a vote. This can be a good thing in that it gets people talking and all have equal say. However, the downside results from diluted language and watered-down issues when it becomes necessary to distill issues to the common denominator. K.U. Schrogl, “A New Impetus for Space Law Making: the 1999 Reform of UNCOPUOS and How It Works”, *Proceedings of the Forty Third Colloquium of the Law of Outer Space*, International Institute of Space Law (IISL), (2000), at 97. 1999 marked the advent of a new agenda structure for COPUOS at the Unispace III Convention. Rather than leave the floor open for any and all issues, Unispace III proposed a working agenda containing work plans with a timetable for action on pertinent issues. Unispace III heralded the intended partnership between the UN system and private industry. *Ibid.* at 96, 99, 103.

be free for use by all countries, irrespective of the ability to get there.” In fact, use of space for the “common benefit of mankind” and “free access for all”, firmly entrenched principles in space law, evoke memories of 1960's socialism and the Cold War environment in which space law was first framed. Today, the two perspectives described above remain in a state of tension.<sup>125</sup>

The commercialization of space is an arena where the polarization between “have-s” and “have-nots” became manifest as Third World countries, without the capital or infrastructure to develop their own satellite systems, were increasingly “vulnerable to First World economic and political power.”<sup>126</sup> However, the more recent shift toward commercial launches has provided greater space access to states that lack launch capability. Regardless, the rift between developed and developing countries widened when interpreting the existing international treaties’ positions on property rights in space.<sup>127</sup> Developed, or First World, countries took a positivist stand, advocating that current air and sea law does not translate to space, an area of exploration still vast and unknown.<sup>128</sup> These countries wanted authority to grant rights to exploit space resources and some ownership and/or control. This faction still claims that any other interpretation of existing space law acts as a disincentive for further space exploration and

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<sup>125</sup> Kim Alaine Rathman, “Sharing the Harvest of the Skies: Outer Space Commercialization and Third World Development” *PHIL & TECH* 3:4 (Summer 1998)

<sup>126</sup> *Ibid.*

<sup>127</sup> *Ibid.* at 3.

<sup>128</sup>

Legal positivism is a conceptual theory emphasizing the conventional nature of law. Its foundation consists in the pedigree thesis and separability thesis, which jointly assert that law is manufactured according to certain social conventions. Also associated with positivism is the view, called the discretion thesis, that judges make new law in deciding cases not falling clearly under a legal rule. As an historical matter, positivism arose in opposition to classical natural law theory, according to which there are necessary moral constraints on the content of law. The word "positivism" was probably first used to draw attention to the idea that law is "positive" or "posited," as opposed to being "natural" in the sense of being derived from natural law or morality.

The Internet Encyclopedia of Philosophy, online:<<http://www.iep.utm.edu/l/legalpos.htm>>(date accessed: 22 October 2008).

development, and that any sharing of technology would be tantamount to a breach of national security.<sup>129</sup>

Developing, or Third World, countries adopted “natural law” as the cornerstone of space law, asserting that natural resources in space are a heritage common to all and not based upon the financial ability to exploit.<sup>130</sup> The Third World countries wanted authority not to grant, but to manage and distribute resources to all peoples equitably. In addition, the developing countries viewed the technologies necessary to utilize space effectively as another resource that should be shared.<sup>131</sup>

It is interesting to note that currently there is a shift in the dichotomy between developed and developing states to that between spacefarer and non-spacefarer states.<sup>132</sup> India is a good example of a developing country that is space faring, evidenced most

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<sup>129</sup> Rathman, *supra* note 125 at 3.

<sup>130</sup> The term "natural law" is ambiguous. It refers to a type of moral theory, as well as to a type of legal theory, but the core claims of the two kinds of theory are logically independent. It does not refer to the laws of nature, the laws that science aims to describe. According to natural law ethical theory, the moral standards that govern human behavior are, in some sense, objectively derived from the nature of human beings. According to natural law legal theory, the authority of at least some legal standards necessarily derives, at least in part, from considerations having to do with the moral merit of those standards. There are a number of different kinds of natural law theories of law, differing from each other with respect to the role that morality plays in determining the authority of legal norms.

The Internet Encyclopedia of Philosophy, online:<<http://www.iep.utm.edu/n/natlaw.htm>>(date accessed: 22 October 2008). The debate between natural law and legal positivism rages in debate over the Law of the Sea and mining of the deep sea bed for precisely the same reasons as it continues in space resource dialog. *See generally* Arcangleo Travaglini “Reconciling Natural Law and Legal Positivism in the Deep Sea Bed Mining Provisions of the Convention on the Law of the Sea” 15:2 Temple Int’l & Comp. L.J.313 (2001).

<sup>131</sup> Rathman, *supra* note 125 at 3 - 4.

<sup>132</sup> Joanne Irene Gabrynowicz *Comments on the Discussion Paper, “Adequacy of the Current Legal and Regulatory Framework Relating to the Extraction and Appropriation of Natural Resources”* presented in Session 4 of the June 2006 Workshop on the Extraction of Natural Resources held at McGill University Institute of Air and Space Law, proceedings published in *Policy and Law Relating to Outer Space Resources: Examples of The Moon, Mars, and Other Celestial Bodies* (2007).

recently by Chandrayan I, its lunar mission.<sup>133</sup> Commercial endeavors gestate in this divergent climate.

In addition to COPUOS, the International Telecommunications Union (ITU) is a specialized agency of the United Nations. The ITU functions as both regulator and coordinator of the telecommunications industry. Despite the prohibition of property ownership in space, the ITU has successfully allocated “slots” in the geostationary orbit (GSO), also described as the spectrum/orbit resource and considered a part of the common heritage of mankind.<sup>134</sup> The ITU consists of state members and also contains a category of members from public and private sectors, manufacturers and service providers, who do not have voting rights, but do participate in committees.

### **Layer One: Treaties**

Dating to 1967, the Outer Space Treaty, known as a “treaty of principles,”<sup>135</sup> was the first and most important of the “space” treaties. It delineated the basic tenets of space law, building in a theme of international cooperation and adopting already existing international law.<sup>136</sup> The other four treaties built upon its framework as gaps became apparent. Application of the Treaty to actual space activity revealed situations that needed more specific guidelines resulting in the other four conventions. All begin with a

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<sup>133</sup> “India’s moon mission enters lunar space” (3 November 2008) Google News online:<<http://afp.google.com/article/ALeqM5hdVllWKVeON5tQJK6m6y4givCPCA>>(date accessed: 4 November).

<sup>134</sup> Gabrynowicz, *supra* note 132. The OST precludes state appropriation, however the ITU gets around this by assigning the right to use as opposed to the right to own, and allowing the right to use perpetually. Other rights include the right to barter a GSO slot, the right to replace a dead satellite, and the right to more recorded assignments than satellites.

<sup>135</sup> Some commentators have described those principles as somewhat ill-defined and ambiguous and subject to broad interpretation. Matte, *supra* note 114, pg. 92 – 93; *see also* Nandasiri Jasentuliyana “The Role of Developing Countries in the Formulation of Space law” *Annals of Air and Space Law* vol. XX-II, 95 (1995).

<sup>136</sup> Treaty on the Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, 610 UNTS 205; opened for signature January 27, 1967, entered into force October 10, 1967.

reiteration of the basic principles found in the OST and then address an area of concern.<sup>137</sup>

Though not as closely aligned to our discussion of current commercial activity in space, Article I of the OST bears mention here as it expressly prohibits a state's "national appropriation by claim of sovereignty" in outer space, including the moon and other celestial bodies, by any means. Commercial exploitation of resources on near earth objects such as asteroids or the moon must necessarily implicate this provision.<sup>138</sup>

Article VI of the OST is the starting point for private activities in space. It contemplates space activity by "governmental agencies or by non-governmental entities" and assigns to state parties international responsibility for treaty compliance by either state actors or the private sector. Non-governmental activities in space require a state's authorization and continuing supervision.

The Rescue Agreement of 1968 established procedures for astronaut rescue and further cements the principle of international cooperation. The treaty defined astronauts as "envoys of mankind" and required states to afford them special care.<sup>139</sup> It sets the stage for the Liability Convention of 1972.

The Liability Convention flows from Article VII of the OST and assigns a tiered liability system in addressing each state's responsibility for its activities in space.<sup>140</sup> The treaty aims to protect innocent victims by assigning strict or absolute liability to the launching state or states for damage occurring on the surface of the earth, in the air or

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<sup>137</sup> *Ibid.*

<sup>138</sup> Gerardine Meishan Goh, "Pella Vilya: Near Earth Objects – Planetary Defence through the Regulation of Resource Utilisation" at 4, 51<sup>st</sup> Colloquia IISL at 59<sup>th</sup> IAC Glasgow (2008).

<sup>139</sup> Agreement on the Rescue of Astronauts, and the Return of Objects Launched into Outer Space, 672 UNTS 119; opened for signature April 22, 1968, entered into force December 3, 1968.

<sup>140</sup> Convention on International Liability for Damage Caused by Space Objects, 961 UNTS 187; opened for signature March 29, 1972, entered into force September 1, 1972.

anywhere other than outer space.<sup>141</sup> Damage occurring in outer space results in fault based liability.<sup>142</sup> Launching state is defined in Article I of the Liability Convention as: (i) a state which launches or procures the launching of a space object; or (ii) a state from whose territory or facility a space object is launched. Once a state meets the definition of a launching state it cannot avoid responsibility for its actions, or the actions of its nationals, in space. Furthermore, a launching state remains responsible for its space activities in perpetuity.<sup>143</sup> When two or more states are involved in a launch, they will be held liable jointly and severally (each for the entire amount of the damage). However, article V paragraph 2, permits apportionment of liability (risk allocation) between launch participants by agreement. Article XIII allows the parties to agree among themselves as to the currency in which compensation is to be paid a claimant.

Issues of registration, jurisdiction, and ownership, first approached in the OST and the original UN resolutions, become further crystallized in the Registration Convention of 1975. This Treaty mandates a central UN registry for all space objects, and demands that states launching objects register these objects and furnish the information to the central registry.<sup>144</sup> Ownership and control of the objects remain with the country of registry.<sup>145</sup>

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<sup>141</sup> *Ibid.*

<sup>142</sup> *Ibid.*

<sup>143</sup> “[T]he Convention is silent on the issue of expiration of ownership of a space object and makes no provision for the use of an international court for the resolution of disputes.” Delbert D. Smith Symposium on the Environmental Law Aspects of Space Exploration & Development THE TECHNICAL, LEGAL, AND BUSINESS RISKS OF ORBITAL DEBRIS (1997) 6 NY Env. L J 50 (citing to Delbert D. Smith, Address at the 1994 DYP London Space Insurance Conference, reprinted in Space Risk Debris and the Outer Space Environment, DYP Space Insurance Report 215, 216 (1994).)

<sup>144</sup> Convention on Registration of Objects Launched into Outer Space, 28 UST 695; opened for signature January 14, 1975, entered into force September 15, 1976.

<sup>145</sup> This is similar to maritime law, where a ship remains within the control of the country under whose flag it sails.

The establishment of the registry allows for better traffic management in space, enforcement of safety standards, and the tracking of liability for damage incurred in, or because of space objects.<sup>146</sup> This Treaty attempts to modernize and align the pre-existing treaties with the realities facing space actors, including private enterprise, as space activities developed. Though possible to partition responsibility, registration remains with one state.

The Registration Convention contemplates the not uncommon situation where two or more states qualify as launching states and mandates joint determination as to which of these states will register the space object,. The Convention defers to contracts between parties regarding jurisdiction and control of the space object and any personnel.<sup>147</sup> However, as space assets can be conveyed, by purchase or assignment, a non-launching-state can become the state of registry, and can be implicated as a launching state subsequent to the launch, a situation not addressed by the convention.<sup>148</sup>

The Moon Treaty of 1979,<sup>149</sup> finally ratified in 1984, still lacks affirmation by any major space powers. To date, seventeen countries have signed, ratified, or acceded to the

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<sup>146</sup> Matte, *supra* note 114, at 103. Space debris continues to be a hot topic for COPUOUS. Tiles, a form of space debris, caused the space shuttle Columbia crash. The Registration Treaty, though an effort to pin down responsibility for flotsam and jetsam in space, cannot assign liability for debris that cannot be tracked back. The US National Security Space Office has a Neighborhood Watch program in the works to promote space situational awareness through cooperation between the US government, the governments of other spacefaring nations, and private industry. Joseph Rouge, "The State of Space Security: Space Situational Awareness" online: <<http://www.gwu.edu/~spi/Joseph%20Rouge.pdf>> (date accessed: 13 March 2008).; Richard DalBello and Joseph Chan, "Linking Government and Industry Efforts to Increase Space Situational Awareness" (24 January 2008) online: <<http://www.gwu.edu/~spi/Richard%20DalBello.pdf>> (date accessed: 13 March 2008).

<sup>147</sup> Registration Convention, Article II (2).

<sup>148</sup> Kay-Uwe Hori & Julian Hermida "Change of Ownership, Change of Registry? Which Objects to Register, What Data to beFurnished, When, and Until When?" American Institute of Aeronautics and Astronautics, Inc. (2003) at 4 – 5.

<sup>149</sup> Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, 18 ILM 1434; opened for signature 18 December 1979, entered into force on 12 July 1984.

Moon Treaty;<sup>150</sup> none were space-faring nations at the time action was taken.<sup>151</sup> Of the seventeen, Kazakhstan (ratified) and India (signed) have the most developed presence in space.

Made necessary by the successful U.S. moon landing in 1969, the agreement applies the OST's provisions to the Moon and other celestial bodies. Reiterating that these bodies only be used for peaceful purposes, it further provides for no disruption of their environments, and most notably, that the Moon and its resources belong to all mankind. The Treaty requires the establishment of an international regime to govern these resources.<sup>152</sup> Lack of support for this treaty indicates the sharp divide between the two schools of thought on acceptable treatment of space resources.<sup>153</sup> The dearth of activity on the moon allowed this Treaty to languish for nearly thirty years. It is likely that technology and the now integral role of the private sector will force the issue of either revamping the Treaty to facilitate activity or simply replacing it with a new one.

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<sup>150</sup> The ratifying states are Australia, Austria, Belgium, Chile, Kazakhstan, Lebanon, Mexico, Morocco, Netherlands, Pakistan, Peru, Philippines, and Uruguay. The states that have signed are France, Guatemala, India, and Romania. Treaties, *supra* note 123

<sup>151</sup> Stephen A. Spitz, "Recent Development, Agreement Governing the Activities of States on the Moon and Other Celestial Bodies," 21 HARV. INTL 579, 584 (arguing that the Moon Treaty will never succeed without "the willingness of the United States and the Soviet Union to accept the common heritage provisions").

<sup>152</sup> This is similar to the legal framework set forth in the Law of the Sea Convention 1982 to exploit resources on and beneath the deep sea bed and flows from the principle that the resources are the common heritage of mankind, a principle also found in the Antarctica Treaty, the Law of the Sea, and the Outer Space Treaty. Kenneth Mwenda "Deep Sea-Bed Mining Under Customary International Law" (June 2000) 7:2 Murdoch University Electronic Journal of Law at ¶ 14 – 15; *See generally* George B. Dietrich "Extending the Principle of the Common Heritage of Mankind to Outer Space" (2002) online:<[http://digitool.Library.McGill.CA:8881/R/-?func=dbin-jump-full&object\\_id=29561&current\\_base=GEN01](http://digitool.Library.McGill.CA:8881/R/-?func=dbin-jump-full&object_id=29561&current_base=GEN01)>(date accessed: 16 February 2009).

<sup>153</sup> *Ibid.* This also refers to the debate between the developed countries and the developing countries, a debate which occurs in deep sea bed mining as well as outer space. For an insightful description of this polarity, see Arcangelo Travaglini "Reconciling Natural Law and Legal Positivism in the Deep Seabed Mining Provisions of the Convention on the Law of the Sea" Vol. 15:2 Temple Int'l & Comp. L.J. 313 (2001). The dichotomy continues in both arenas, as evidenced by the paucity of ratifications of the Moon Treaty as well as the United States' failure to ratify either that Treaty or UNCLOS.



In addition to the five treaties described above delineating legal obligations, four sets of principles representing moral obligations outline UN policy for telecommunications (*Principles on Direct Broadcasting*, 1982);<sup>154</sup> remote sensing (*Principles on Remote Sensing*, 1986); nuclear power in space (*Principles on Space Nuclear Power*, 1992); and continued international cooperation (*Declaration of Space Benefits*, 1996).<sup>155</sup> The principles exhibit the UN's increasing awareness of the need for policy that supports the original principles found within the OST and subsequent treaties, but that also engenders space commerce.<sup>156</sup>

Although non-binding, the *Resolution on the Application of the Concept of the "Launching State"* calls upon launching states to "consider enacting and implementing national laws authorizing and providing for continuing supervision of the activities in outer space on non-governmental entities under their jurisdiction," and to conclude "agreements in accordance with the Liability Convention with respect to joint launches or

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<sup>154</sup> The Principles Governing the Use by States of Artificial Earth Satellites for International Direct Television Broadcasting (resolution 37/92 of 10 December 1982). This is the only space law instrument that failed to pass by consensus in COPUOS. Instead, after reaching an impasse, the principles were put to a vote by the United Nations General Assembly and passed by majority (107 votes to 13). Nandasiri Jasentuliyana *Space Law: Development and Scope* (Greenwood Publishing Group, 1992) at 38; David L. Fisher, *Prior Consent to International Direct Satellite Broadcasting* (Utrecht Studies in Air and Space Law) (Deventer: Kluwer Academic Publishers, 1990).

<sup>155</sup> The Principles Relating to Remote Sensing of the Earth from Outer Space (resolution 41/65 of 3 December 1986); The Principles Relevant to the Use of Nuclear Power Sources in Outer Space (resolution 47/68 of 14 December 1992); The Declaration on International Cooperation in the Exploration and Use of Outer Space for the Benefit and in the Interest of All States, Taking into Particular Account the Needs of Developing Countries (resolution 51/122 of 13 December 1996). Treaties are considered "hard law" while declarations and principles are viewed as "soft law." Online: <[http://portal.unesco.org/shs/en/ev.php-URL\\_ID=3942&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](http://portal.unesco.org/shs/en/ev.php-URL_ID=3942&URL_DO=DO_TOPIC&URL_SECTION=201.html)> (date accessed: 7 November 2008).

<sup>156</sup> See the text of Remarks by Kenneth Hodgkins, U.S. Adviser to the Fifty-seventh Session of the United Nations General Assembly, Remarks on Agenda Item 75: International Cooperation in the Peaceful Uses of Outer Space, in the Fourth Committee, New York, New York, October 9, 2002. As yet, the United Nations has not presented a formal policy statement regarding space debris but it did publish a technical report on the topic in 1999. UN Debris Technical Report, online: <[http://www.oosa.unvienna.org/pdf/reports/ac105/AC105\\_720E.pdf](http://www.oosa.unvienna.org/pdf/reports/ac105/AC105_720E.pdf)> (date accessed: 2 February 2009).

cooperation programmes.”<sup>157</sup> This instrument continues with the recommendation that launching states voluntarily provide information on their domestic procedures regarding in-orbit transfer of ownership of space objects and urges states to harmonize these national practices among themselves to increase the consistency of domestic legislation with international law.<sup>158</sup>

These are the instruments that comprise the *lex spatialis*. Consensus for a new treaty addressing the still unresolved issues of resource utilization and how to recapture investment with no chance of property rights, as well as controversial issues surrounding anti-satellite weapons, becomes less likely as the space interests of a greater number of states become more vested and less abstract.<sup>159</sup> Two principles found in the OST, and reaffirmed in the subsequent treaties, have been widely acknowledged as customary international law – non-appropriation and freedom of exploration, and as such they apply to all states regardless of whether they have ratified the treaty.<sup>160</sup>

### **Layer Two: Domestic Legislation**

The next layer of space law, domestic regulation, is in place to fill any perceived voids in the above-described framework.<sup>161</sup> It is at this level that each state enacts legislation and promulgates rules to ensure compliance with the treaties by its nationals, activities for which that state is ultimately responsible as either the registering state or a launching state. States have a choice in how these objectives are achieved; the United

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<sup>157</sup> General Assembly Resolution 59/115, adopted 10 December 2004.

<sup>158</sup> *Ibid.*

<sup>159</sup> Gennady M. Danilenko, *Outer Space and the Multilateral Treaty-Making Process*, 4 High Tech. L.J. 217, 219 - 20 (1989).

<sup>160</sup> Gennadii M. Danilenko *Law Making in the International Community* (Martinus-Nijhoff Publishers 1993) 152 n. 91. Although the same author as cited in the immediately preceding footnote, these two publications spell his name differently.

<sup>161</sup> Hori, *supra* note 148 at 6; Joanne Irene Gabrynowicz “The International Space Treaty Regime in the Globalization Era “Ad Astra” (Fall 2005) online:<<http://www.space-settlement-institute.org/Articles/IntlSpaceTreatyGabryno.pdf>>(date accessed: 20 October 2008).

Kingdom handles exemptions from launch licenses on a case-by-case basis, while Australia and the United States have codified requirements, including the extraterritorial effects of the licensing regimes.<sup>162</sup>

Not all domestic legislation is created equally.<sup>163</sup> The United States leads with the most developed body of domestic laws. In the US, national space policy derives from four sources: 1) classified presidential directives from the National Security Council, the only source not available to public scrutiny; 2) enacted laws; 3) presidential policy declarations; and 4) international conventions such as those described in this chapter in the preceding section.<sup>164</sup> The Commercial Space Launch Amendments Act of 2004 (CSLA) is the first piece of national legislation to address suborbital flight and space flight participants, introducing the concept of informed consent, and allowing experimental flight permits without the lengthy, cumbersome, and expensive process of licensing.<sup>165</sup> In addition, the CSLA addresses financial responsibility and directs Congress to conduct several studies on liability risk sharing and safety. Chapter Five will include a comparison of Canadian and US remote sensing laws to illustrate the ways in which domestic laws can exist in harmony with respect to some provisions and in conflict with others, even where the domestic laws are largely congruent.

### **Layer Three: Licensing and Export Controls**

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<sup>162</sup> Hori, *supra* note 148 at 6.

<sup>163</sup> Despite the Resolution, there is a dearth of states with actual space legislation in place: Australia, Canada, France, Japan, Korea, Russia, South Africa, Sweden, UK, and the US. Ram Jakhu *Government Regulation of Space Activities Volumes I – II*; Doo Hwan Kim *Korea's space development programme: Policy and Law* Space Policy 22 (2006) 110 – 117.

<sup>164</sup> R.Cargill Hall *Military Space and National Policy: Record and Interpretation* (The Marshall Institute 2006) 19 – 20.

<sup>165</sup> 42 U.S.C.A. § 2451; Public Law 108-492 December 23, 2004; Randy Hancock “Provisions of the Commercial Space Launch Act (CSLA)” Space Policy 21 (2005) 227 – 29.

Because of the dual nature of the technology involved (civil and military), once a space venture begins the process of navigating through the statutory licensing regime in place in all of the relevant states, national security concerns are implicated and the project becomes subject to national regulations for export control.<sup>166</sup> In the US, these fall within section 38 of the Arms Control Act.<sup>167</sup> Although the Act authorizes the President to control the import and export of specific items, amendments actually delegate the duty to the Secretary of State through promulgated International Traffic in Arms Regulations (ITARs).<sup>168</sup> In Canada, the task falls to the Export and Import Controls Bureau of the Department of Foreign Affairs and International Trade by way of the Export and Import Permits Act.<sup>169</sup> Waivers are available, such as those extended to both the United Kingdom and Australia by the US and described in Chapter One.<sup>170</sup> The uncertainty resulting from ITARs is addressed further in Chapter Three.

#### **Layer Four: Contracts**

The reality is that despite international treaties and domestic regulation, many space activities are also governed by private agreements. These can be bi-lateral

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<sup>166</sup> In Canada, items which trigger export control include global navigation systems, propulsion and space-related equipment and the software necessary to operate them, as well as the technology making these items possible. Export and Import Permits Act, Export Control List (SOR/89-202). In the US, the three major lists of export-controlled items are the Commerce Control List (CCL), the United States Munitions List (USML), and the Nuclear Regulatory Commission Controls (NRCC); these include dual use items covered by the Wassenaar Agreement, missile technology, items related to anti-terrorism, and unlisted items destined for specified end-uses or end-users (a catch all).  
Online: <<http://www.exportcontrol.org/index.php/pagetype/htmlpage/id/2081.html>> (date accessed: 7 November). See generally Federal Aviation Administration, Office of Commercial Space Transportation *Introduction to U.S. Export Controls for the Commercial Space Industry* (October 2008).

<sup>167</sup> 22 U.S.C. 2778.

<sup>168</sup> ITAR Part 120 online: <[http://pmddtc.state.gov/regulations\\_laws/itar\\_official.html](http://pmddtc.state.gov/regulations_laws/itar_official.html)> (date accessed: 22 October 2008).

<sup>169</sup> E-19, online: <<http://laws.justice.gc.ca/en/showdoc/cs/E-19///en?page=1>> (date accessed: 22 October 2008).

<sup>170</sup> The conflict between Britain's lack of specificity regarding transfer of technology to third parties and the US regulations and policies post 9/11 were largely responsible for the long time spent negotiating the waiver between the two states. "UK Warns USA Over ITAR Arms Restrictions" (1 December 2005) online: <<http://www.defenseindustrydaily.com/uk-warns-usa-over-itar-arms-restrictions-01549/>> (date accessed: 22 October 2008).

agreements as between states, such as the *Exchange of Notes constituting an Agreement between the Government of Australia and the Government of the United States of America for Cooperation in a Transit Navigational Satellite Program*,<sup>171</sup> the joint-venture agreements in place to govern a public-private partnership, or memoranda of understanding, such as that between Australia and the Earth Remote Sensing Data Analysis Center (ERSDAC) of Japan on the development and application of earth observation.<sup>172</sup> NASA alone has signed thousands of agreements between 1959 and 1995.<sup>173</sup>

The agreement governing the International Space Station is an excellent example of a multi-lateral agreement.<sup>174</sup> This layer of space regulation also contains private agreements between non-state actors, a topic to be explored further in the fourth chapter. One example is technology transfer agreements, often used in space ventures to manage intellectual property rights.<sup>175</sup>

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<sup>171</sup> Steven Freeland “When Laws are Not Enough – The Stalled Development of an Australian Space Launch Industry” 8 Univ. of Western Sydney L.R. (2004), 79 at 81. For an excellent analysis of the bilateral treaty arrangement between Canada and India, see Ram Jakhu “The case for enhanced India-Canada space cooperation” Space Policy 25 (2009) 9-19.

<sup>172</sup> Commonwealth Scientific and Industrial and Research Organization (CSIRO) online:<[http://www.innovation.gov.au/Industry/Space/Documents/CSIRO\\_2008.pdf](http://www.innovation.gov.au/Industry/Space/Documents/CSIRO_2008.pdf)>(date accessed: 16 March 2009).

<sup>173</sup> John J. Hudiburg *Techno-Political Space Cooperation: A Model for Explaining NASA’s Record of International Cooperation* presented at the 54<sup>th</sup> Int’l Astronautical Congress of the Int’l Astronautical Federation, the Int’l Academy of Astronautics, and the Int’l Institute of Space Law, 29 September – 3 October 2003, Bremen Germany.

<sup>174</sup> *Agreement among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of Russian Federation and the Government of the United States of America concerning cooperation on the Civil International Space Station* (29 January 1998); see also the *Agreement among the Government of the Republic of Kazakhstan, the Government of the Russian Federation and the Government of the United States of America on Technology Safeguards associated with the Launch by Russia of US Licensed Spacecraft from the Baikonur Cosmodrome* (26 January 1999).

<sup>175</sup> *Overview of the Contractual Agreements for the transfer of technology* WIPO online:<[http://www.wipo.int/sme/en/documents/pdf/technology\\_transfer.pdf](http://www.wipo.int/sme/en/documents/pdf/technology_transfer.pdf)>(date accessed: 12 March 2009).

## **Chapter Three**

### **Uncertainty**

How could something well guided  
Turn out to be divisive  
Mostly wondering  
It seems uncertain

“311”

If ever there was a time to write about uncertainty, particularly in business, now would be it.<sup>176</sup> Economies around the world continue to seek the bottom of the present downward economic cycle, and although a painful prospect, there is the promise of comfort in knowing the lowest point, a point of departure from which to rebuild. The ability to predict a business' highs and lows with some certainty provides both economic benefits, most apparent in realistic costing and planning, and legal benefits, by allowing entities the opportunity to comport with the existing state of the law to achieve desired results.<sup>177</sup> This chapter addresses the need to know potential downsides and foreseeable risks in commercial space endeavors and identifies general examples of the uncertainties that have arisen in space ventures.

Julian Hermida defines space risks “as the uncertainty regarding losses derived from a space activity,” representing “the exposure to losses faced by an organization engaged in the exploration or exploitation of Outer Space.”<sup>178</sup> These risks can be

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<sup>176</sup> I am writing this thesis autumn 2008 through spring 2009, as fear not only grips but paralyzes business activity world wide. Jack Healy “Major Indexes Fall Sharply as Economic Uncertainty Spurs Fear” (12 November 2008) New York Times online:<<http://www.nytimes.com/2008/11/13/business/worldbusiness/13markets.html?partner=rss&emc=rss>>(date accessed: 15 December 2008).

<sup>177</sup> “Comport” means that the business is behaving a certain way to comply; “to behave in a manner conformable to what is right, proper, or expected.” Merriam Webster online:<<http://www.merriam-webster.com/dictionary/comport>>(date accessed: 16 March 2009).

<sup>178</sup> Julian Hermida “Risk Management in commercial launches” Space Policy 1997 13(2) 145-152 at 145. Peter Nesgos has described the “issues of concern” as (i) credit risk, (ii) technology risk, (iii) market risk, (iv) asset risk, (v) political risk. Lecture on Legal Issues in Structuring Satellite Projects, given at McGill University Institute of Air and Space Law, (31 March 2008).

classified as (i) political, (ii) financial, (iii) technical, and (iv) legal.<sup>179</sup> This paper will focus on legal and political risks, but it is important to be aware of the others since most often, more than one risk is implicated in a proposed transaction.

Political risk derives from changes in government as expressed in either stated policy or legislation.<sup>180</sup> An example of this would be the effect of the dissolution of the Soviet Union on Russia's space policies in 1993.<sup>181</sup> It can also arise in the conflicts between the governmental policies implicated by the various parties involved, or governmental interference in the form of contract repudiation, expropriation and/or confiscation, licensing, regulation, and export controls. A change in government does not necessarily result in a policy change; the two are not mutually inclusive and government stability does not preclude policy uncertainty.<sup>182</sup>

Financial risks come about because of changes in the market place not contemplated when the project is gestating, or as a result of unfavorable debt ratios and borrower credit. Technical risks are particularly pertinent in space ventures because of the degree of innovation involved in the technologies used to arrive at and stay in space, and the nature of the space environment itself.

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<sup>179</sup> Hermida, *supra* note 178 (citing Robinson and Meredith, "Case Study for Practitioner"). Commentators of international risk in business categorize the general types of risk into five types: natural, legal, societal, political, and governmental or four types: political, financial, cultural, and natural. Adel Al Khattab et. al. "Managerial perceptions of political risk in international projects" *Int'l J of Project Mngm't* 25 (2007) 734 – 743, 735. In particle physics, the uncertainty principle holds that certain physical quantities such as position and momentum cannot both have precise values at the same time. "Uncertainty principle" online:<[http://en.wikipedia.org/wiki/Uncertainty\\_Principle](http://en.wikipedia.org/wiki/Uncertainty_Principle)>(date accessed: 12 March 2009). If the probability distribution for one of these is narrow, it correlates to a wider distribution for the other. Extrapolating this theory to the law of commercial space ventures, the more fixed the treaties' position on a subject, the wider the variance for uncertainty relating to that subject.

<sup>180</sup> Political risk can be seen as encompassing both societal and legal risk. *Ibid.*

<sup>181</sup> "Civil War in Moscow, 1993" online:<<http://www.friends-partners.org/oldfriends/mes/russia/period/october93.html>>(date accessed: 16 December 2008).

<sup>182</sup> Kent D. Miller "A Framework for Integrated Risk Management in International Business" (2Q 1992) *J of Int'l Business Studies* 311, 314.

Lastly, legal risks represent exposure to liability and to uncertainties that arise when the different domestic legal systems implicated are in conflict.<sup>183</sup> Several factors previously discussed increase the insecurity in a space deal, namely, the multi-national nature of many ventures and the degree of interaction between the government and the private sector.

While the treaties impose responsibility and liability onto the states involved, either directly or through nationals, the states in turn shift the burden to private companies and/or insurers through domestic legislation. There are varying degrees of specificity in that domestic legislation. As a result, structuring a space project utilizing only conventional risk allocation tools, such as insurance, to provide a degree of predictability can often result in confusion. Thorough examination of all relevant risks during the initial structuring of a project is a must.

### **Political Risk, ITARs, and Shutter Control**

Possibly one of the most serious impediments to fully integrated collaboration in commercial space is the regulatory environment in place to protect national security from the transfer of technology into the wrong hands. Most of the technology involved in space is considered to be dual in nature, or civilian with military potential.<sup>184</sup> National security concerns drive export regulations. The control regime currently applied in the United States has resulted in a degree of uncertainty as to exactly who can export what

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<sup>183</sup> The tendency of different courts to apply their own “home” law in conflict of law situations creates some of this uncertainty, to be discussed later in this chapter. Klaus Peter Berger “The *Lex Mercatoria* doctrine and the UNIDROIT principles of international commercial contracts” 28 Law and Policy in International Business, n. 4, 1997, 943-990, 946.

<sup>184</sup> Dual use technologies are those arising from civilian applications but that also have potential for military use. As a result, states exert control over their export. “Dual Use” Trade Issues online:<[http://ec.europa.eu/trade/issues/sectoral/industry/dualuse/index\\_en.htm](http://ec.europa.eu/trade/issues/sectoral/industry/dualuse/index_en.htm)>(date accessed: 16 March 2009); “Export Control Overview” Indiana University online:<<http://research.iu.edu/rschcomp/excontrol.html>>(date accessed: 16 March 2009)..



and where, also described as political risk.<sup>185</sup> This has created problems for the academic science community as well as the business community.

It is difficult to find a simple definition of political risk. However, this paper centers on international business and from that perspective, there are two prevalent approaches. The first defines political risk in terms of governmental interference with business operations and the second classifies political risk as the imposition of any political or societal event upon an international project.<sup>186</sup> Political or societal events have been further broken down into three main categories: host government risks, which include export controls and ownership/personnel restrictions;<sup>187</sup> host society risks, like terrorism;<sup>188</sup> and interstate risks, such as wars and economic sanctions. Similar to the devolution of the dichotomy once found in space between developed and developing countries, political risk which had traditionally been attributed more to transnational foreign investment in emerging states, is now a factor in projects in developed states as well.<sup>189</sup> In fact, the impact of the global financial crisis will probably further redefine political risk as more government intervention is seen in conventionally apolitical arenas like banking and insurance, in both developed and developing states alike.<sup>190</sup>

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<sup>185</sup> "Space Science and the International Traffic in Arms Regulations: Summary of a Workshop" Space Studies Board (SSB) (September 2007)  
<online:[http://www.nap.edu/openbook.php?record\\_id=12093&page=1](http://www.nap.edu/openbook.php?record_id=12093&page=1)>(date accessed: 16 March 2009).

<sup>186</sup> Adel Al Khattab et. al. "Managerial perceptions of political risk in international projects" *Int'l J of Project Mngm't* 25 (2007) 734 – 743, 735.

<sup>187</sup> Host-government risks are: expropriation and/or confiscation, contract repudiation, currency inconvertibility, ownership and/or personnel restrictions, taxation restrictions, and import/export controls. *Ibid.* at 735.

<sup>188</sup> Other host-society risks are demonstrations, riots, insurrection, revolutions, coups d'état and civil wars.

<sup>189</sup> Gillian Rice and Assam Mahmoud "Political Risks Forecasting by Canadian Firms" *International Journal of Forecasting* 6 (1990) 89-102, 91.

<sup>190</sup> "The Global State of Political Risk in the Wake of the Financial Crisis: A Question and Answer with Control Risks" online:<[http://www.pri-center.com/documents/Global\\_State08.pdf](http://www.pri-center.com/documents/Global_State08.pdf)>(date accessed: 4 March 2009). For a more academic discussion of the impact of financial crises in general on foreign direct investment and political risk, see Nathan Jensen "Measuring Risk: Political Risk Insurance Premiums and Domestic Political Institutions"

The transnational politics model of political processes “emphasizes the increasingly important role in world politics being played by organizations other than those of national governments.”<sup>191</sup> The risk of trade barriers is becoming greater than expropriation.<sup>192</sup> Export restrictions can have an adverse impact on both the host country’s balance of trade and an international project’s ability to export goods.<sup>193</sup> One study of political risk forecasting showed that business or project managers from industrialized states rank import/export restrictions as a greater concern than civil disorder, war, and expropriation.<sup>194</sup>

Export controls, particularly ITAR in the United States,<sup>195</sup> are an enormous factor in a discussion of commercial space. A recent report by the National Research Council describes the US export control system as “broken” and blames the current rules for harming not only the US economy, but also, ironically, US national security.<sup>196</sup> This is because the cumbersome controls discourage commercial firms from modifying or adapting technology for military use, making it difficult for the military to get the benefit of the best technology available.

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online:<<http://www.international.ucla.edu/research/private/article.asp?parentid=33099>>(date accessed: 4 March 2009).

<sup>191</sup> Thomas L. Brewer “Political Risk Assessment for Foreign Direct Investment Decisions” (Spring 1981) Columbia J of World Business, 5.

<sup>192</sup> *Ibid.*

<sup>193</sup> Khattab, *supra* note 186 at 737.

<sup>194</sup> Rice, *supra* note 189 at 94.

<sup>195</sup> International Traffic in Arms Regulations.

<sup>196</sup> Debra Werner “NRC Report Says U.S. Export Control System Is “Broken” Space News Vol 20 Iss 3 19 January 2009 at 13, describing the report, “Beyond Fortress America : National Security Controls on Science and Technology in a Globalized World.” Export controls and their oft times extraterritorial reach have been controversial for some time. The Canadian Council on International Law commissioned a study of the subject. A.L.C. de Mestral and T. Gruchalla-Wesierski *Extraterritorial Application of Export Control Legislation: Canada and the U.S.A.* (Dordrecht: Kluwer Academic, 1990).

The topic is considered so important that it was included in the Aerospace Industries Association Election 2008 Issues.<sup>197</sup> To facilitate reform, US industry groups formed a coalition to lobby administration officials to relax the interpretation of the export regulations and reduce the license applications backlog.<sup>198</sup> Also to this end, a session of the Satellite 2007 conference in Washington was devoted to a panel of government and industry officials discussing the state of current controls and the potential for reform.<sup>199</sup>

Despite these efforts, an FBI investigation of India's Defense Research and Development Organization led to the arrest of at least five Indian nationals, creating tension between the countries. The charges were for allegedly acquiring and exporting US dual use technologies, including computer chips for India's missile, space and Light Combat Aircraft programs, without proper licenses from the Department of Commerce.<sup>200</sup> Similarly, a Russian court convicted the Russian head of a Chinese rocket and space technology company on similar charges of leaking sensitive technology.<sup>201</sup>

Policy changes made it more difficult, though not impossible, for China to purchase high-tech items from the US.<sup>202</sup> Meanwhile, China capitalized on its satellites with no US components, marketing them as ITAR free, which led Arianespace to caution

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<sup>197</sup> "AIA Election Issue 2008: Export Control Modernization" Aerospace Industries Association (AIA) online: [http://www.aia-aerospace.org/industry\\_information/export\\_control\\_modernization/aia\\_election\\_2008\\_issue\\_export\\_control\\_modernization/](http://www.aia-aerospace.org/industry_information/export_control_modernization/aia_election_2008_issue_export_control_modernization/) (date accessed: 16 March 2009).;

<sup>198</sup> Caitlin Harrington, "US lobby group seeks export control reforms" *Jane's Defence Industry* (14 March 2007) 31.

<sup>199</sup> Jeff Foust, "A new hope for export control reform?" (26 February 2007) online: The Space Review <<http://www.thespacereview.com/article/819/1>> (date accessed: 14 March 2008).

<sup>200</sup> Vivek Raghuvanshi, "Export Case Threatens U.S.-India Ties" *DefenseNews* (30 April 2007) 1.

<sup>201</sup> Vladimir Isachenkov, "Space Company Chief Convicted of Spying" *ABC News* (3 December 2007) online: <<http://abcnews.go.com/International/comments?type=story&id=3945959>> (date accessed: 14 March 2008).

<sup>202</sup> Wendell Minnick, "U.S. Streamlining Curbs on Exports To China's Military" *DefenseNews* (25 June 2007) 19.

the US against possible Chinese “dumping.”<sup>203</sup> Thales Alenia Space was able to launch its ITAR-free spacecraft via China’s Long March expendable launch system. Arianespace denounced Thales for flouting ITAR, despite its contracts to launch multiple spacecraft for Globalstar and an option for as many more.<sup>204</sup>

Export control is an issue in Europe as well. In 2007, the European Commission unveiled its new European Space Policy, addressing the need for an appropriate legal and managerial framework and for definition of security-related requirements.<sup>205</sup> The task is daunting as the many member states in the EU have their own separate national interests.<sup>206</sup> The European Space Agency’s efforts to partner with India have been frustrated by stringent trade export regulations.

A different form of government regulation involves the increased calls for regulation of commercial imaging. The tension continues between commercial and/or civilian access to information through increasingly superior imagery applications, and national security concerns about the exposures inherent in making such information available to the masses or to rogue states or individuals, from multiple commercial sources.<sup>207</sup> Thomas Friedman puts it succinctly when he says, “[t]he flatter the world gets, the more we are going to need a system of global governance that keeps up with all

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<sup>203</sup> “Arianespace warns US over Chinese space ‘dumping’” (30 November 2007) online: <<http://afp.google.com/article/ALeqM5gRSPI2HxWsPwjfICbGanIw4VN0SQ>> (date accessed: 12 March 2008).

<sup>204</sup> “News Breaks: Asia Pacific” *Aviation Week & Space Technology* (10 September 2007).20; David Bond, ed., “Washington Outlook: Stars in Alignment” *Aviation Week & Space Technology* (10 September 2007) 23.

<sup>205</sup> Brooks Tigner, “Space Policy Rises on EU Radar” *DefenseNews* (7 May 2007) 22.

<sup>206</sup> Antonella Bini, “Export control of space items: Preserving Europe’s advantage” *Space Policy*, 23:2 (May 2007) 70-72.

<sup>207</sup> Katherine Shrader, “Curbs on Satellite Photos May Be Needed” *San Francisco Chronicle* (8 May 2007) online: <<http://www.sfgate.com/cgi-bin/article.cgi?f=/n/a/2007/05/08/national/w140605D01.DTL&type=politics>> (date accessed: 13 March 2008).

the new legal and illegal forms of collaboration.”<sup>208</sup> For any industry to flourish, including space, that governance must be “predictable, fair, and enforceable.”<sup>209</sup>

### **Exposure to Liability**

No description of space business, and its need for certainty, is complete without a discussion of space insurance. Coverage can be obtained for the period prior to launch, lift-off, in-orbit operations of a satellite, and re-entry, and for property loss, third party liability, and products liability.<sup>210</sup> The United States imposes a governmental obligation to cover third-party liability over the maximum probable loss (MPL) cap.<sup>211</sup> In addition, the new FAA rules for suborbital flight mandate cross-waivers and raise questions as to whether these will stand up to judicial scrutiny, and whether space or aviation law will apply.

Liabilities to third parties to a space project are governed principally, but not exclusively, by the Outer Space Treaty and the Liability Convention, and further defined by national laws and specific contractual provisions between participants in the project.<sup>212</sup> Space liability insurance, explored in more depth in Chapter Four, is placed in a sub-market of the aviation insurance market. There are two main types: spacecraft third party liability insurance and space products liability insurance. The former is most often procured by satellite operator/owners or launch agencies, with additional insureds all

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<sup>208</sup> Friedman, *supra* note 3 at 253

<sup>209</sup> Hertzfeld, *supra* note 47 at 211.

<sup>210</sup> Nesgos, *supra* note 178.

<sup>211</sup> The US formula for MPL can be found at 14 C.F.R. 450.7 appendix A and is the standard used worldwide. online:<<http://cfr.vlex.com/vid/450-obtaining-probable-licensed-reentry-19565890>>(date accessed: 9 March 2009). It is a risk-based analysis for determining risks and potential consequences due to mishaps that may occur during phases of flight of space vehicles.

<sup>212</sup> Sophie Moysan, Aviation and Space Department, Marsh SA *The Insurance Point of View* presented at Project 2001 Plus Workshop “Towards a harmonized approach for National Space Legislation in Europe” Berlin 29-30 January 2004.

participants to the space project including the “appropriate states”<sup>213</sup> and “launching states.”<sup>214</sup> Space products liability insurance is usually obtained by space product manufacturers and sub-contractors, either as an extension to an aviation product insurance policy (space endorsement) or by way of a specific space product liability insurance program.<sup>215</sup>

A challenge in space insurance can be found in coverage on an “occurrence” basis, extending protection only for events that occur during the period of coverage. This is problematic in space; a space object can cause harm long after the coverage expires and the object ceases to function.<sup>216</sup> The event triggering liability could be a manufacturing defect that occurred in year 1 of a satellite’s life, but was not revealed until year 5. Other events that could trigger liability might occur during delivery of the space object to the operator, or loss of control or collision once in orbit. The claim could ripen anywhere along the timeline, creating a real question as to which insurance policy should be applied.<sup>217</sup> This is further complicated by the fact that some events are triggered by more than one factor; for instance, loss of control of an object could result in

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<sup>213</sup> Originating in the OST, the term “appropriate state” relates to the duty of a state to authorize and continuously supervise the activities of private space actors. For a far more comprehensive analysis of this term, see Julian Hermida, *Legal Basis for a National Space Legislation* (Springer, 2004) 40 – 46, excerpted here in part. “[T]he appropriate state has been equated with the state of nationality, the launching state, the state concerned, the responsible state, and with a combination of these concepts.” *Ibid.* at 40 -41 (citations omitted).

<sup>214</sup> Launching state, as defined in the Liability Convention, includes (i) a state which launches, (ii) a state which procures a launch, (iii) a state from whose territory a space object is launched, or (iv) a state from whose facility a space object is launched. Three of these are clear (i, iii, and iv) while (ii) has been found ambiguous by some writers. Marietta Benko, et al., *Space Law: Current Problems and Perspectives for Future Regulation* (Eleven International Publishing, 2005) at 132-33/

<sup>215</sup> Moysan, *supra* note 213.

<sup>216</sup> Space debris is an ongoing concern. The United Nations “Technical report on space debris” United Nations (1999). And for good reason – the recent collision between the spent Russian satellite Cosmos 2251 and Iridium 33, one of the satellites found in the US owned communications constellation, resulted in a great deal of debris in the low earth orbit which will likely affect other active satellites. Online: <<http://www.agi.com/corporate/mediaCenter/news/iridium-cosmos/>> (date accessed: 4 March 2009).

<sup>217</sup> Policy periods are usually twelve months long. Occurrence basis means that coverage for year one is only for liabilities relating to an occurrence that occurred in year one, no matter when the claim is submitted. Moysan, *supra* note 213.

failure to transmit data at one point in time and a collision and damage years later.<sup>218</sup> Space debris best illustrates the time trigger problem; debris can damage long after a policy expires or, theoretically, long after an insurer ceases to be in business. And while this is not entirely different from timeline problems with respect to triggering events in other industries, the space environment poses some challenges not found in other coverages by virtue of, *inter alia*, distance from earth, characteristics of orbit, and environmental exposure. In addition, the problem is exacerbated by the reality of different coverages procured by different parties along the timeline of a space object's life.<sup>219</sup>

Another issue with the potential to create uncertainty in space is the issue of informed consent for spaceflight participants, found in the United States Commercial Space Launch Amendments of 2004 and expanded upon in the Office of Commercial Space Transportation's final rule on the matter.<sup>220</sup> This is a method of allocating risk, this time to the spaceflight participant him or herself.<sup>221</sup> The rule describes a number of

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<sup>218</sup> France recently addressed this particular issue in the Act of 1 August 03 on Financial Security, entered into force on 2 November 03. The Insurance Code was modified to allow parties to define coverage by choice between "damageable fact" or by the claim and defines "damageable fact" as "fact, act or event at the origin of the damage suffered by the victim and giving rise to the claim."

<sup>219</sup> For many years, controversy raged in France over the use of "claims made" clauses and "occurrence" clauses. "Claims made" clauses stipulate that the insurer will cover only those claims submitted by an insured during the policy period, which is often prejudicial to the injured party. As a result, French case law favored "occurrence" clauses, which cover losses caused by events that occur during the policy period regardless of when the claim is made. Occurrence coverage makes far more sense in the context of space insurance. With the passing of the law, parties to insurance policies in France can now choose between the two clauses but there is higher degree of disclosure required of the insurer to the insured. Camille Piot "Civil Liability Insurance: The Reform Long Awaited by French Insurers" the bullet "iln" newsletter, International Lawyers Network, online:<[http://www.iln.com/bullet\\_iln\\_three\\_one/lefevre\\_article.htm](http://www.iln.com/bullet_iln_three_one/lefevre_article.htm)>(date accessed: 13 March 2009).

<sup>220</sup> Human Space Flight Final Rule, Description of Final Rule and Discussion of Comments II(C)(2)(a) on Launch and Re-entry With a Space Flight Participant, Informed Consent and the Space Flight Participant's Ability to Be Informed, 71 Federal Register 241 (Dec. 15, 2006).

<sup>221</sup> For a comprehensive study of the subject, see the FAA/AST "Study on Informed Consent for Spaceflight Participants" Document No. APT-CFA-230-0001-02F (26 September 2008) online:<

express requirements for how to inform a participant, but does not specify exactly what to inform that participant about.<sup>222</sup>

Informed consent requires comprehension of the risks and autonomy to make the choice. Spaceflight, even for highly trained astronauts, remains a somewhat recent addition to the human repertoire of experience and there is scarce data, but the data that exists reveals statistics that are chilling – a loss rate of 1 in 57.<sup>223</sup>

### **Choice of Law**

In addition, the grey areas defying easy predictability in risk allocation for space ventures include the lack of harmonization of domestic laws implicated by the parties to the venture and their respective state's methods of complying with the space treaties' requirements. It becomes difficult to assess the levels of exposure of the insured, and to fairly price the product. In some instances, cross waivers and other indemnification agreements may be enforceable in some states but not others. Further, the Liability Convention prescribes absolute liability for the launching states for injury on earth or in airspace, leading to uncertainty as to whether a participant can assume the entire risk by

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[www.faa.gov/about/office\\_org/headquarters\\_offices/ast/reports\\_studies/media/Informed%20Consent%20Report.doc](http://www.faa.gov/about/office_org/headquarters_offices/ast/reports_studies/media/Informed%20Consent%20Report.doc) (date accessed: 16 March 2009).

<sup>222</sup> Tracey Knutson "What is 'Informed Consent' for the space-flight participants in the soon-to-launch space tourism industry?" 33 *Journal of Space Law* 105 (2007).

<sup>223</sup> *Ibid.* at 112 n. 29. Some additional statistics may help put these figures in perspective. A loss rate of 1 in 57 represents an incident rate of 1.75%. Accidents while skydiving, an extreme sport for which providers must obtain the participant's informed consent, number about 1 in 3800, or .03%.

Online: <<http://myskydivingpro.info/>> (date accessed: 18 February 2009). On the other hand, the odds of being involved in a fatal accident on an airplane, an activity which does not require a passenger's informed consent, number 1 in 8.47M, or .00001%, on the top 25 airlines with the best records and 1 in 830,428, or .0001%, on an airline in the bottom 25 with the worst records.

online: <<http://www.planecrashinfo.com/cause.htm>> (date accessed: 24 March 2009). Because medical procedures often require informed consent, the statistical probability of injury is also included here. 1.011 per 1,000 hospitalized at-risk patients developed iatrogenic pneumothorax in America 2000-2002 which represents an incident rate of .10%. "Patient Safety in American Hospitals" Health Grades (2004)

online: <[http://www.wrongdiagnosis.com/i/iatrogenic\\_conditions/stats.htm](http://www.wrongdiagnosis.com/i/iatrogenic_conditions/stats.htm)> (date accessed: 18 February 2009). "Iatrogenic" is a term that describes an adverse condition (illness, injury or death) which is a direct result of a medical procedure. Online: <<http://www.iatrogenic.org/define.html>> (date accessed: 18 February 2009).



signing an informed consent and ostensibly attempting to alleviate a launching state's ultimate responsibility.

As space business becomes more transnational, choice of law issues rise in level of importance.<sup>224</sup> Not only is choice of law an issue by virtue of the conflicts between the domestic laws of all multi-national parties, but so too is the problem of which courts have jurisdiction over disputes, and where and how any resulting judgments can be enforced.<sup>225</sup> Deficient understanding of the implications of all of these matters can hinder, rather than facilitate, a transaction.

A unique choice of law complication may arise as a result of the fact that there is, as yet, no resolution to the question of where exactly the delimiter between air and space lies, creating potential overlap in legal regimes applicable to an event. One school of thought, the spatialist, relies upon a fixed location – all below it is in airspace, all above it is outer space.<sup>226</sup> The other turns on the function of a space object – how it stays up in the air – is it because of a reaction between the object and the air (an aircraft, hence under the air law regime) or is it by thrust from a power source (so a rocket and subject to space law)?<sup>227</sup> This is becoming a more probable and imminent reality. Some vehicles, like the shuttle, are able to function as both airplane and rocket.<sup>228</sup> To an extent, the domestic regulatory and licensing regimes of each of the space-faring states takes care of the lacunae. For instance, in the US, commercial spaceflight falls under the purview of the

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<sup>224</sup> Andrew T. Guzman posits maximization of global welfare as the objective for choice-of-law rules.

Andrew T. Guzman "Choice of Law: New Foundations" *Georgetown Law Journal* (April 2002) 3.

<sup>225</sup> Peter Machin North *Essays in Private International Law* "Choice in Choice of Law" (New York: Oxford University Press, 1993) 171.

<sup>226</sup> Alexandra Harris and Ray Harris "The need for air space and outer space demarcation" *Space Policy* 22 (2006) 3 – 7, 6.

<sup>227</sup> *Ibid.* The definition of "aircraft" derives from the Annexes to the Chicago Convention. Convention on Civil Aviation, (1944) 15 U.N.T.S. 295, entered into force 4 April 1947.

<sup>228</sup> "Space Shuttle" online: < <http://www.bookrags.com/research/space-shuttle-woi/> > (date accessed: 15 March 2009).

Office of Commercial Space Transportation which is a part of the Federal Aviation Administration. It treats suborbital vehicles separately from aircraft, imposing a separate licensing scheme. However, another state could treat the matter differently. The lacunae persists because the Liability Treaty itself refers to the location of a damaging event to assign the degree of liability; with no bright line rule for airspace and outer space and with the lower earth orbit becoming more populated with earth observation space craft, this holds potential for some uncertainty as to which regime will prevail.

### **Sovereign Immunity and Public-private partnerships**

Despite the many examples of successful ventures that fall within the spectrum of public-private cooperation, clearly instructive is the sad story of Europe's Galileo, a global navigation service system. The European Commission abandoned the original plan for substantial participation by the private sector in the face of liability concerns.<sup>229</sup> In December 2007, transport ministers decided to go ahead with Galileo as a publicly funded project.<sup>230</sup> The failure of the state-private partnership in the Galileo project demonstrates why appropriate allocation of risk between public and private partners necessitates discussion of state immunity.

And, in litigation now before the US courts, an Israeli-owned and controlled remote sensing corporation, ImageSat, has claimed immunity in a shareholder's

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<sup>229</sup> Elmar Giemulla & Oliver Heinrich, "The Impact of Responsibility and Liability for Galileo Services on System-Financing and Commercialization" (2008) 57 ZLW 1, 25 at 39; Taylor Dinerman, "Galileo and her Majesty's Taxpayers" online: The Space Review (9 July 2007) <<http://www.thespacereview.com/article/904/1>> (date accessed 20 April 2008); "Galileo Services: Chances for Business" presented at Eurisy Conference, Prague, Czech Republic (24 – 25 April 2006) online: <<http://www.eurisy.org/site/upload/PDFa/90Prague%20final%20Conclusions%20and%20Recommendations.pdf>> (date accessed: 20 April 2008).

<sup>230</sup> Peter B. de Selding, "Galileo Funding Solution Remains Elusive" (17 September 2007) online: <[http://www.cmdbox.com/view/Galileo\\_Funding\\_Solution\\_Remains\\_22651/](http://www.cmdbox.com/view/Galileo_Funding_Solution_Remains_22651/)> (date accessed: 13 March 2008).

derivative action questioning business decisions.<sup>231</sup> An understanding of the background, purposes, and mechanics of government immunity can only help the space industry address these situations proactively.

Absent a universal legal definition, public-private partnerships (P3s) are “generally recognized [to exist] wherever there is a contractual relationship between the public sector and a private sector company designed to deliver a project or service that traditionally is carried out by the public sector.”<sup>232</sup> In Canada, the term has a very specific meaning: “[f]irst, it relates to the provision of public services or public infrastructure. Second, it necessitates the transfer of risk between partners. Arrangements that do not include these two concepts are not technically ‘public-private partnerships’....”<sup>233</sup> Allocation of risk is a necessary factor. Chapter One describes a number of space-related P3s.

P3s are creative arrangements. Usually, a governmental entity enters into contract with a private consortium which sets up a single purpose entity known as a special purpose vehicle (SPV). The private consortium is typically formed by a joint venture (JV) between a range of contractors, banks, investors, and suppliers willing to commit equity and/or resources to the project.<sup>234</sup>

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<sup>231</sup> *Wilson et al. v. ImageSat International N.V. et al*, Case No. 1:2007cv06176, New York Southern District Court.; Jason A. Crook, “Corporate-Sovereign Symbiosis: *Wilson v. ImageSat Int’l*, Shareholders’ Actions, and the Dualistic Nature of State-owned Corporations” (2007) 33 *Journal of Space Law* 2, 411.

<sup>232</sup> Cook, *supra* note 96.

<sup>233</sup> Online: The Canadian Council for Public-Private Partnerships  
<[http://www.pppcouncil.ca/aboutPPP\\_definition.asp](http://www.pppcouncil.ca/aboutPPP_definition.asp)> (date accessed on 20 April 2008).

<sup>234</sup> A. Ng, Martin Loosemore, “Risk Allocation in the private provision of public infrastructure” (2007) 25 *Int’l J of Project Management* 66, 67.

“Sovereign immunity encompasses immunity from both suit and liability.”<sup>235</sup> A recognized state enjoys immunity from the jurisdiction of the courts of other states.<sup>236</sup> The doctrine can operate as a bar to actions between sovereigns, but is more often implicated in actions between private parties engaged in activities with governmental entities. If a government can avoid responsibility for its actions as a partner in space industry by invoking state immunity, the risks borne by the private side of the venture could be disproportionate to the possible upside potential. Such imbalance can create an uneven playing field and, perhaps, cripple commercial growth. It is worth noting that the International Civil Aviation Organization (ICAO) listed sovereign immunity as an identified liability concern for Global Navigation Satellite Systems (GNSS) in its Final Report on the Work of the Secretariat Study Group on Legal Aspects of CNS/ATM systems.<sup>237</sup>

It is easy to imagine scenarios in which the public partner of a space-related P3 could attempt to evade a lawsuit. For instance, a contractual breach flowing from the P3 agreement itself could be avoided. Third party liability to private parties for accidents in a spaceport launch facility (such as the explosion at Scaled Composites in 2007) could be circumvented. A government partner could sidestep liability for any simple slip and fall in a spaceport or facility of a space P3. Responsibility for damage from the cessation or

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<sup>235</sup> *Gulf Electroquip, Inc. v. University of Texas at Austin*, 2002 WL 480245 (Tex. App. Houston – 14<sup>th</sup> Dist. 2002); see also *GLF Constuction Corp. v. LAN/STV*, 414 F.3d 553, 557 (5<sup>th</sup> Cir. 2005).

<sup>236</sup> Hugh M. Kindred, et. al *International Law: Chiefly as Interpreted and Applied in Canada*, 7<sup>th</sup> ed. (Toronto: Edmond Montgomery Publications Ltd., 2006) at 285.

<sup>237</sup> ICAO Appendix to Final Report on the Work of the Secretariat Study Group on Legal Aspects of CNS/ATM Systems, C-WP/12197 3.4.1. CNS/ATM stands for Communications, Navigation and Surveillance Systems for Air Traffic Management. The system uses digital technologies, including satellite systems, and varying levels of automation to achieve a seamless global Air Traffic Management system. Online: <[http://www.caa.govt.nz/about\\_caa/CNS\\_ATM.htm](http://www.caa.govt.nz/about_caa/CNS_ATM.htm)>(date accessed: 5 March 2009).

malfunction of a signal of a global emergency response system or navigation system could be dodged.

State immunity has evolved from absolute to restrictive, or immunity with exceptions. The European Convention on State Immunity, adopting restrictive state immunity, was signed by all members of the Council of Europe in 1972.<sup>238</sup> Eventually, the United States Congress in 1976 enacted the Foreign States Immunity Act (FSIA), codifying the restrictive theory, thus reflecting the policy followed by a majority of States.<sup>239</sup>

The United Kingdom passed its State Immunity Act in 1978; Canada followed with its State Immunity Act in 1983. Both adopted restrictive immunity. The United Nations Convention on the Jurisdictional Immunities of States and Their Property was adopted by the General Assembly in 2004 and reflects the restrictive theory of state immunity.<sup>240</sup> The United States Supreme Court officially espoused restrictive immunity for foreign states in *Alfred Dunhill of London, Inc. v. Republic of Cuba*, although the case was argued under a different theory, the act of state doctrine.<sup>241</sup> The Court found that the case essentially dealt with an issue of immunity, which it denied because the conduct was commercial in nature.<sup>242</sup>

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<sup>238</sup> Council of Europe ETS no. 074, European Convention on State Immunity, Basle, 16.V.1972.

<sup>239</sup> The case of *Trendtex Trading Corp. v. Central Bank of Nigeria* contains an interesting perspective on the position of the international community on the subject of state immunity in 1977, one year after the FSIA was enacted. [1977] 1 Q.B. 529 (C.A.).

<sup>240</sup> “Ad Hoc Committee on Jurisdictional Immunities of States and their Property” online: <<http://www.un.org/law/jurisdictionalimmunities/index.html>> (date accessed: 17 April 2008). The European Community is in discussion as to how best to denounce its prior Convention once the new instrument enters into force. 981 Meeting, 29 November 2006; 10.1 Committee of Legal Advisers on Public International Law, Appendix Three.

<sup>241</sup> 425 U.S. 682 (1976).

<sup>242</sup> *Ibid.*

Prior to enactment of the FSIA, Congress passed the International Organizations Immunities Act (IOIA). The statute granted international organizations “the same immunity from suit and every form of judicial process as is enjoyed by foreign governments, except to the extent that such organizations may expressly waive their immunity for the purpose of any proceedings or by the terms of any contract.”<sup>243</sup> At the time the statute entered into force, the immunities extended to foreign governments by the United States were absolute. The FSIA, as described in this section, restricted this immunity.

The United States Supreme Court has not, as yet, ruled on the scope of immunity offered to intergovernmental organizations (IGOs) under the IOIA, however, in a recent (2008) appellate case, *Inversora Murten, S.A. v. Energoprojekt-Niskograndnja Co.*, the District of Columbia Circuit Court held the immunity to still be absolute.<sup>244</sup> As a result, there are no exceptions for commercial activity, etc. The only available exception is achieved through the organization’s own express waiver. International and national law governing immunity for international organizations requires that the language of such a waiver must not be broad on its face but narrowly construed, and must further the organization’s objectives in entering the contract or agreement in which the waiver is found.<sup>245</sup>

Executive Order 9698 contains an extensive list of international organizations entitled to enjoy the absolute immunity of the IOIA.<sup>246</sup> A number of space related

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<sup>243</sup> 22 U.S.C. 288a(b).

<sup>244</sup> 264 Fed.Appx. 13 (D.C. Cir. ,2008.) at \*2.

<sup>245</sup> *Ibid.* at \*1.

<sup>246</sup> Executive Order 9698 of February 19, 1946, 11 F.R. 1809, [EO 9698 amended by EO 10083 of Oct. 10, 1949, 14 FR 6161, 3 CFR, 1949-1953 Comp., p. 284; EO 10533 of June 3, 1954, 19 FR 3289, 3 CFR, 1954-1958 Comp., p. 194].

organizations can be found on the list, including the European Space Research Organization succeeded by the European Space Agency, the International Telecommunications Union, the International Telecommunications Satellite Organization, and the United Nations. Additionally, ICAO, the United International Bureau for the Protection of Intellectual Property and the World Intellectual Property Organization are listed. Great care should be taken to properly word express waivers of immunity in P3 agreements involving listed IGOs, taking into account that the organization must receive some benefit for the immunities it releases.

The text and structure of the FSIA “demonstrate Congress’ intention that the FSIA be the sole basis for obtaining jurisdiction over a foreign state in [US] courts.”<sup>247</sup> As a starting point, then, “a foreign state is presumptively immune from suit unless a specific exception applies.”<sup>248</sup> Courts employ a burden-shifting analysis; the defendant foreign state “must first establish a prima facie case that it is a sovereign state, creating a rebuttable presumption of immunity. Once the foreign sovereign makes that prima facie showing of immunity, the plaintiff has the burden of production to make an initial showing that an FSIA exception to foreign immunity applies.”<sup>249</sup> In the United States, the courts have developed a number of tests to determine whether a state can avoid liability.<sup>250</sup>

The decision of how to apply the various immunity tests to P3s becomes more difficult the closer to the middle of the continuum between private and public one finds the entity at issue. An activity carried out by a foreign state can be denied immunity if

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<sup>247</sup> *Argentine Republic v. Amerada Hess Shipping Corp.*, 488 U.S. 428, 434 (1989).

<sup>248</sup> *Permanent Mission of India to the United Nations v. City of New York*, 127 S.Ct. 2352, 2355 (2007).

<sup>249</sup> *Orient Mineral Co. v. Bank of China*, 506 F.3d 980, 991 (10<sup>th</sup> Cir. 2007) (citations omitted).

<sup>250</sup> For an in-depth discussion of the various tests that have evolved, see Diane Howard *Achieving a Level Playing Field* J Air Law & Commerce (Fall 2008) 723.

purely commercial. On the other hand, as the following citation explains, an independent contractor following his contract to the letter can enjoy immunity.

“[T]he most important factors to consider in deciding whether a hybrid entity is the state for purposes of sovereign immunity are the extent of state control and whether the entity was acting as the state’s agent in conducting the activity that gave rise to the suit.”<sup>251</sup> US courts are “extremely hesitant to extend this fundamental and carefully limited immunity to private parties whose only relationship to the sovereign is by contract.”<sup>252</sup> This is not necessarily a bad thing. The commercial exception in restrictive foreign state immunity was adopted primarily because it leveled the playing field in a world where governments were behaving increasingly as ordinary trade partners. At this point in history, governments actually are trade partners.

### **“Best Efforts” Clauses**

As in many commercial contracts, another area of imprecision arises because of the use of “efforts” clauses. For instance, satellite launch and initial operations policies sometimes contain provisions requiring named insureds to use best efforts to secure the insurers access to all information used or resulting from investigation or review of a loss. Remote sensing license agreements can include language that limits an end user’s remedies for a warranty claim to the provider’s reasonable efforts to repair or replace the sensed data product with no definition. More problematic are the examples of “efforts” clause usage found in the stock purchase agreement between Loral Space & Communications Ltd. and Sirius Satellite Radio Inc., filed with the United States Security

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<sup>251</sup> *Takle v. University of Wisconsin Hosp. and Clinics Authority* 402 F.3d 768, 772 (7<sup>th</sup> Cir. 2005) (citing *Thiel v. State Bar of Wisconsin*, 94 F.3d 399 (7<sup>th</sup> Cir. 1996)).

<sup>252</sup> *Del Campo v. Kennedy*, 517 F.3d 1070, 1076 (9<sup>th</sup> Cir. 2008)



and Exchange Commission (SEC) on 14 August 1997.<sup>253</sup> In it, three different efforts clauses are used: diligent best efforts with regard to registration of shares,<sup>254</sup> best efforts to prevent the issuance of any stop order by the SEC,<sup>255</sup> and reasonable efforts to register shares under blue sky laws and to list shares on a securities exchange.<sup>256</sup>

“Best efforts” have been litigated in the context of space contracts. In *Hughes Communications Galaxy, Inc. v. United States*,<sup>257</sup> *American Satellite Co. v. United States*,<sup>258</sup> and *New Valley Corp. v. United States*,<sup>259</sup> commercial telecommunications satellite owners brought suit against the United States to recover damages flowing from the NASA’s breach of “best efforts” contracts to launch the satellites into orbit. NASA had suspended commercial launches after the Challenger exploded in 1986. The Courts in the *Hughes*, *American Satellite*, and *New Valley* cases found the United States in breach, meaning that NASA/the government had not used their best efforts. The controversy surrounding “efforts” clauses creates uncertainty regarding the standard they represent. The next chapter, describing how contracts can be used as effective tools facilitating more predictable business, will attempt to provide some solutions to this dilemma.

To summarize, uncertainty in space deals takes many forms. Policy conflicts and/or changes can result in licensing delays. Export restrictions and security concerns can kill a deal. Choice of law and conflicts of law issues are hard to avoid. So, too, is the time/occurrence issue.

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<sup>253</sup> SEC online:<<http://www.secinfo.com/dRe2b.8Ye.d.htm>>(date accessed: 9 March 2008).

<sup>254</sup> *Ibid.* at 18.

<sup>255</sup> *Ibid.* at 20.

<sup>256</sup> *Ibid.*

<sup>257</sup> 271 F.3d 1060 (Fed. Cir. App. 2001).

<sup>258</sup> 998 F.2d 950 (Fed. Cir. 1993).

<sup>259</sup> 67 Fed. Cl. 277 (Fed. Clms 2005).

If not addressed in the structure of a P3, and accommodated by thoughtful risk allocation between the private and public partners, sovereign immunity can be a source of risk. Contractual language can be a pitfall, either in the wording of an informed consent waiver of liability or the use of an “efforts” clause. Some issues cannot be resolved by contract, no matter how carefully drawn. However, when possible, unambiguous language, clearly expressing the parties’ intentions, and allocating the risk in manners with which they feel comfortable, can resolve many problems, as will be described in the next chapter.

## **Chapter Four**

### **The Tools We Have**

If I had a hammer  
I'd hammer in the morning  
I'd hammer in the evening  
All over this land  
I'd hammer out danger  
I'd hammer out a warning  
I'd hammer out love between my brothers and my sisters  
All over this land

Lee Hays and Pete Seeger

This paper has identified a number of areas in space ventures where risks proliferate. Despite these, participants are not left without some methods to assuage potential exposures. This chapter explores the tools available to the commercial space sector. Although the chapter is organized into different sections, there is a common theme – the use of contractual agreements to achieve the results intended by the parties who are involved. Contracts are used in a variety of ways,<sup>260</sup> but the same underlying principles ensure their effectiveness despite the different context where found. The instant chapter examines each identified area of uncertainty and offers contractual solutions available to foster predictability. While a simple premise, it must be workable in a vast number of situations and harmonize with many legal systems. As Johann Wolfgang von Goethe said, “Everything is simpler than you think and at the same time more complex than you can imagine.”<sup>261</sup>

### **Contract Drafting**

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<sup>260</sup> A non-exhaustive list of some of these includes technology transfer agreements, cross-waivers of liability, end user licensing agreements, satellite operator agreements, launch agreements, purchase agreements, lease agreements, insurance contracts, and transponder leases.

<sup>261</sup> Online:< <http://www.phnet.fi/public/mamaa1/goethe.htm>>(date accessed: 24 March 2009).

A contract is an agreement between two or more parties that has legal effect; it creates obligations for which legal enforcement is available if the promised performance does not occur.<sup>262</sup> It is more than a shared belief. It is a common understanding, mutual assent, as to some future conduct by one, both, or all of the parties involved.<sup>263</sup>

Careful drafting is imperative in order to ensure that the legal instrument truly represents the intentions and understanding of all parties. To this end, two rules facilitate clarity: 1) consistency and 2) use of standard language.<sup>264</sup> The second rule is important because the “law component of a contract should be limited to *what* is being expressed, not *how* it is expressed.”<sup>265</sup> Contract interpretation, discussed later in this section, is implicated when third parties, either the courts or an arbitral tribunal, are brought in to resolve a dispute or determine rights and responsibilities under an agreement.

The function of language in a contract goes beyond simple communication of ideas. It can also serve to memorialize actions or to state obligations. A better understanding of the practical effects of the words used can aid clear and transparent drafting. The different categories of contractual language are: 1) language of performance;<sup>266</sup> 2) language of obligation;<sup>267</sup> 3) language of discretion;<sup>268</sup> 4) language of

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<sup>262</sup> Charles L. Knapp, et al. *Problems in Contract Law: Cases and Materials* (4<sup>th</sup> ed. Aspen Law & Business, Aspen Publishers, Inc. New York, 1999) at 2.

<sup>263</sup> *Ibid.*

<sup>264</sup> Kenneth A. Adams *A Manual of Style for Contract Drafting* (Adams I) (American Bar Assoc. 2004) at 1.

<sup>265</sup> *Ibid.* (emphasis in original).

<sup>266</sup> Language of performance “serves to memorialize actions of the parties that are contemporaneous with the signing of the contract.” It uses the present tense and it is best to use the active voice. *Ibid.* at 20.

<sup>267</sup> Language of obligation “states the obligations of one or more parties to a contract.” *Ibid.* at 22. It can be imposed upon the subject of the sentence or on someone other than the subject. It uses “shall” or “must” or “will” but “shall” is the least problematic of the three. *Ibid.*

<sup>268</sup> Language of discretion is language that allows a party discretion as to whether or not to take a given action. *Ibid.* at 31. “May” is the best word to use when assigning a discretionary act.

prohibition;<sup>269</sup> 5) language of policy;<sup>270</sup> and 6) language of representation.<sup>271</sup> In addition, some methods of expressing conditions are more effective than others.<sup>272</sup>

One helpful technique in contract drafting is to include defined terms.<sup>273</sup> These are almost always nouns or noun phrases.<sup>274</sup> A pitfall in defining terms is circular reference; one should not use in a definition the term being defined.<sup>275</sup> There are rules governing usage of definitional verbs. For instance, a definition that gives the entire or full meaning of a term can use “means” while an enlarging definition, expressing only part of a definition would start with “includes” and a limiting definition, excluding something from the meaning of the defined term, is introduced by “does not include.”<sup>276</sup> One should not use “means” and “includes” in the same definition; the former expresses a full definition but the latter only an incomplete meaning. The best place in the contract for the definition section is at the end where it can be easily referenced.<sup>277</sup>

Vagueness and ambiguity are often confused. The terms are not mutually inclusive or equivalent in any way. While vagueness is, by definition, imprecise, it is a standard drafting tool. Ambiguity, on the other hand, refers to inconsistent meanings and

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<sup>269</sup> Language of prohibition “specifies what parties to a contract are prohibited from doing.” *Ibid.* at 36. “Shall not” is a far better term to use than “may not” as the latter suffers from ambiguity.

<sup>270</sup> Language of policy expresses rules that the parties must observe but that do not expressly require or permit some action or inaction on their part. *Ibid.* at 38.

<sup>271</sup> A representation is preceded by a statement that the party or parties “represent as follows” and is the presentation of a fact made to induce someone to enter into a contract. It can relate to past, present, or future circumstances. *Ibid.* at 46.

<sup>272</sup> It is best to use the term “condition” rather than “condition precedent” or “condition subsequent” It is better to express a condition subsequent by stating that if X happens, then Y will cease. *Ibid.* at 40.

<sup>273</sup> This could be similar to the glossary of acronyms found at the end of this paper.

<sup>274</sup> It is better to use the singular form when defining a noun unless the plural is the natural form of the word. *Ibid.* at 73.

<sup>275</sup> *Ibid.* at 73.

<sup>276</sup> *Ibid.* at 75.

<sup>277</sup> *Ibid.* at 81.

is always a detriment to clear drafting and the source of a great deal of litigation.<sup>278</sup>

Two kinds of vagueness can be found in contracts. The first are “words the meaning of which is derived from an objective assessment of context”<sup>279</sup> while the second category consists of “words and phrases the meaning of which is derived by considering context from the perspective of one or more of the parties” instead of objectively.<sup>280</sup> There are many ways that vagueness can actually serve as an advantage in contract drafting. For example, if a situation is subject to so many variables that precision would be impractical, as when attorneys’ fees are addressed. Setting a cap on the allowable fees would not be as useful as using vague but objective terminology, such as “reasonable fees and costs.” Likewise, more precise terms can sometimes require extended negotiation and, ultimately, negotiations could fail. The contract may contain enough precision in material terms that certain non-material terms can be left vague, saving time. The downside of vagueness comes from the fact that the parties may have very different interpretations of the vague term, resulting in dispute as to whether an obligation was breached or a condition satisfied.

“Best efforts” clauses, discussed in Chapter Three, are an example of the first kind of contractual vagueness, relying on an objective assessment of a parties efforts to perform an obligation under the contract. There are a number of different “efforts” clauses in use, ranging from “best” through “commercially reasonable and diligent.”<sup>281</sup>

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<sup>278</sup> *Ibid.* at 85.

<sup>279</sup> These are words that relate to time (immediately, promptly, as soon as practicable) and are often qualified with the word “reasonably”. Other words that fall within this first category of vagueness are “fair,” “substantially,” “unreasonably,” and “undue.” “Best efforts” clauses also fall within this category and will be discussed further in this section. *Ibid.* at 86.

<sup>280</sup> Some examples of the second category are “acceptable,” “convenient,” and “satisfactory.” Often the contract will specify who is to make the subjective determination. *Ibid.* at 86.

<sup>281</sup> Kenneth A. Adams “Understanding: ‘Best Efforts’ And Its Variants (Including Drafting Recommendations) (Adams II) *The Practical Lawyer* (August 2004) 11, 12. This article provides an

Generally, “best efforts” are thought to represent the most onerous standard, requiring the promisor to do everything in its power to perform, even if it means bankruptcy.<sup>282</sup> However, “efforts” clauses are often litigated and the case law does not support this belief. The promisor, while obligated to make a good faith effort to succeed in achieving the goal, is allowed to give “reasonable consideration to its own interests.”<sup>283</sup> Still, the promisor is obligated to act “in good faith to the extent of its own total capabilities” and, *de minimis*, perform “as well as the average prudent comparable performer.”<sup>284</sup> Recent court decisions have held that “best efforts” is a standard higher than that of good faith.<sup>285</sup> Very often “best efforts” and “reasonable efforts” are used interchangeably, as in the Uniform Commercial Code.<sup>286</sup>

In common law Canada, and not unique to those jurisdictions, whether “best efforts” were used turns on the facts of a particular case as viewed against an objective reasonableness standard.<sup>287</sup> The British Columbia case of *International Hard Suits* contains a summary of principles derived from Canadian jurisprudence on the subject of “best efforts.”<sup>288</sup> While all reasonable steps must be taken, this does not impose a “boundless” obligation onto a party, but one requiring “no stone [be left] unturned.”<sup>289</sup>

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interesting evaluation of the different efforts clauses used in the SEC filings in January 2004, with “best efforts” taking the lead.

<sup>282</sup> “Best Efforts and Endeavors – Case Analysis and Practical Guidance Under U.S. and U.K. Law” Jones Day (2007) at 1.

<sup>283</sup> *Bloor v. Falstaff Brewing Corp.*, 601 F.2d 609, 614 (2d Cir. 1979).

<sup>284</sup> *Ibid.* at 613.

<sup>285</sup> *Satellite Broad. Cable, Inc. v. Telefonica De Espana*, 807 F.Supp. 210, 217 (D.P.R. 1992) (holding that the efforts clause expanded extra-contractual damages beyond a “mere good faith requirement”); *Knoboth v. Brent*, 215 S.D.2d 813, 814 (N.Y. App. Div. 1995) (“[B]est efforts’ requires more than ‘good faith,’ which is an implied covenant in all contracts...”).

<sup>286</sup> U.C.C. Section 2-306(2).

<sup>287</sup> *Atmospheric Diving Systems Inc. v. Int’l Hard Suits Inc.*, 89 B.C.L.R. (2d) 356 at para, 66, [1994] 5 W.W.R. 719.

<sup>288</sup> *Ibid.* at para. 75 – 83.

<sup>289</sup> *Ibid.* at para. 79, 83.

In the U.K., “best endeavors” is used in similar fashion to “best efforts;” reasonableness is the standard by which the former is judged. One commentator suggests that “best” is a misnomer as the case law does not support interpretation of the standard as equivalent to the plain meaning of that word.<sup>290</sup> He posits that “reasonable efforts” is more in keeping with decisional law.

Contractual problems because of “efforts” clauses arise most often where the contract lacks a benchmark standard. Again, careful drafting and defined terms are the solution. The core definition of the efforts standard used in the contract should include what the core meaning is and what it excludes.<sup>291</sup>

Another problem arises when the contract refers to more than one “efforts” standard without definition, as in the contracts discussed in Chapter Three. This can create an ambiguity problem of sorts. The dilemma arises when courts choose to assign different meanings to each term, despite the parties’ intentions. If more than one “efforts” standard is to be included, each one should be concisely defined.

Contractual ambiguity arises when a provision is capable of two or more inconsistent meanings. There are two sources of ambiguity: semantic, which is inherent to a word or phrase; or syntactic, arising out of the order in which the words appear and how grouped structurally.<sup>292</sup> In short, while vagueness may serve the parties’ goals, ambiguity seldom does. It is often the result of carelessness and is the root cause of a great deal of dispute because it obscures the intentions of the parties to the agreement. At

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<sup>290</sup> Adams (II), *supra* note 287 at 18.

<sup>291</sup> *Ibid.* Mr. Adams suggests the following core definition of “reasonable efforts:”

“Reasonable efforts” means, with respect to a given goal, the efforts that a reasonable person in the position of [the promisor] [Acme] would use so as to achieve that goal as expeditiously as possible.

<sup>292</sup> Adams (I), *supra* note 264 at 115.



one time contractual ambiguity was automatically construed against the drafter, *contra proferentum*.<sup>293</sup> However, an examination of the “reasonable expectations” of the parties, particularly in insurance contracts, now figures into the equation.<sup>294</sup> The traditional view held that ambiguity must necessarily exist before courts would employ rules of construction to ascertain intent of the parties. This is no longer the case in all jurisdictions.<sup>295</sup> For instance, in *Investors Compensation Scheme LTD v. West Bromwich Building Society*, a case from the United Kingdom, Lord Hoffman eschews ambiguity altogether when he summarizes the “common sense principles” used by modern courts to construe a contract’s meaning.<sup>296</sup> However, the Supreme Court of Canada stated that

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<sup>293</sup> In Quebec’s civil code this rule is found in C.C.Q.art. 1432:

In case of doubt, a contract is interpreted in favour of the person who contracted the obligation and against the person who stipulated it. In all cases, it is interpreted in favour of the adhering party or the consumer.

Regardless of whether there is ambiguity, the consumer, or the insured in an insurance contract, will prevail in interpreting a provision in Quebec.

<sup>294</sup> Maurice Audet “Rules of Contract Interpretation” *Construction Law Reports* 3d series (2004) 289.

However, exactly whose reasonable expectation is to govern is not applied consistently and some jurisdictions apply the reasonable expectation doctrine even where no ambiguity is found. Mary Z. Pejril “Reasonable Expectations: Contract Ambiguity v. Arbitrary Application” *Drake L. Rev.* Vol. 34 (1985 – 86) 1065. Audet puts forth the following rules of construction:

The four overriding rules are:

1. Always try to determine the intent of the parties at the time the contract was entered into, but do so by reference only to the “four corners” of the contract.
2. An interpretation that defeats the purpose of the contract, even if the language is not ambiguous, must be avoided.
3. The interpretation must make commercial sense.
4. The contract must be interpreted as a whole.

These four rules are supposed to apply even when the *contra proferentum* rule is invoked. Are there other rules that apply? There are several other rules. The following is not an exhaustive list:

1. The insured must bring himself within the terms of the insuring agreement.
2. The insuring agreement is to be interpreted broadly so as not to limit coverage.
3. Exclusions are to be interpreted narrowly.
4. The insurer must prove the application of the exclusion.
5. Words are to be interpreted in accordance with the context in which they are used.
6. Words are to be interpreted in their normal, non-technical sense unless they are specifically defined in the policy.
7. Language that has been deleted can play no role in determining the intent of the contract.

<sup>295</sup> Pejril, *supra* note 294 at 1072.

<sup>296</sup> [1998] 1 W.L.R. 896, 912 – 13. The principles are

- (1) Interpretation is the ascertainment of the meaning which the document would convey to a reasonable person having all the background knowledge which would reasonably have been available to the parties in the situation in which they were at the time of the contract.

“when there is no ambiguity in the wording of the document, the notion [] that the interpretation which produces a ‘fair result’ or a ‘sensible commercial result’ should be adopted is not determinative.”<sup>297</sup> Rather, presuming the parties intended the legal consequences of their chosen words allows their intent to be gleaned from the plainly worded document itself without use of interpretative aids.<sup>298</sup> On the other hand, the Civil Code of Quebec does not require ambiguity as a threshold to interpretation of a contract;

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(2) The background was famously referred to by Lord Wilberforce as the "matrix of fact," but this phrase is, if anything, an understated description of what the background may include. Subject to the requirement that it should have been reasonably available to the parties and to the exception to be mentioned next, it includes absolutely anything which would have affected the way in which the language of the document would have been understood by a reasonable man.

(3) The law excludes from the admissible background the previous negotiations of the parties and their declarations of subjective intent. They are admissible only in an action for rectification. The law makes this distinction for reasons of practical policy and, in this respect only, legal interpretation differs from the way we would interpret utterances in ordinary life. The boundaries of this exception are in some respects unclear. But this is not the occasion on which to explore them.

(4) The meaning which a document (or any other utterance) would convey to a reasonable man is not the same thing as the meaning of its words. The meaning of words is a matter of dictionaries and grammars; the meaning of the document is what the parties using those words against the relevant background would reasonably have been understood to mean. The background may not merely enable the reasonable man to choose between the possible meanings of words which are ambiguous but even (as occasionally happens in ordinary life) to conclude that the parties must, for whatever reason, have used the wrong words or syntax: see *Mannai Investments Co. Ltd. v. Eagle Star Life Assurance Co. Ltd.* [1997] A.C. 749 .

(5) The "rule" that words should be given their "natural and ordinary meaning" reflects the common sense proposition that we do not easily accept that people have made linguistic mistakes, particularly in formal documents. On the other hand, if one would nevertheless conclude from the background that something must have gone wrong with the language, the law does not require judges to attribute to the parties an intention which they plainly could not have had. Lord Diplock made this point more vigorously when he said in *Antaios Compania Naviera S.A. v. Salen Rederierna A.B.* [1985] A.C. 191, 201:

"if detailed semantic and syntactical analysis of words in a commercial contract is going to lead to a conclusion that flouts business commonsense, it must be made to yield to business commonsense."

*Ibid.*

<sup>297</sup> *Eli Lilly & Co. v. Novopharm Ltd.*, [1998] 2 S.C.R. 129, at para. 56.

<sup>298</sup> *Ibid.*

the common intention of the parties trumps adherence to the literal meaning of the contract's words.<sup>299</sup>

The “reasonable expectations” of the parties have become a judicial tool used to divine contractual meaning. However, debate rages as to whether determination of these expectations is a rule of construction at all, and, if so, exactly whose expectations should be considered and for what reason.<sup>300</sup> Even in contracts where no ambiguity exists but contractual terms are not specifically defined within the agreement, “reasonable expectations” have been used to ferret out their meaning.<sup>301</sup>

In addition to use as a tool in contract interpretation, “reasonable expectations” describes the gist of the contract that courts are committed to protecting. Characterizing the phrase as a slogan, rather than a term of art, Smith describes three different interpretations of what the term “reasonable expectations” actually means.<sup>302</sup> First, the normative interpretation relies upon the expectations of the morally reasonable party.<sup>303</sup> The problem with this approach is that it has little to do with the parties to the contract, instead imposing abstract and objective expectations upon their agreement. Smith describes two variations, the actual expectations of the contracting parties and the expectations of typical contracting parties, requiring either to be morally reasonable.<sup>304</sup> However, this moral obligation could also be tied to implied obligations of good faith.

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<sup>299</sup> C.C.Q. art 1425.

<sup>300</sup> Stephen A. Smith “The Reasonable Expectations of the Parties: An Unhelpful Concept” (2009) Presented at the 38<sup>th</sup> Annual Workshop on Commercial and Consumer Law, University of Manitoba at 1.

<sup>301</sup> Pejril, *supra* note 294 at 1074.

<sup>302</sup> Smith, *supra* note 300 at 1.

<sup>303</sup> *Ibid.* at 2 – 5.

<sup>304</sup> *Ibid.*

Smith's next interpretation of the phrase depends upon rational expectations based upon experience, an empirical interpretation.<sup>305</sup> Here, meaning could flow from subsequent conduct or relied upon promises. It is in the empirical interpretation that Smith places use of "reasonable expectations" as an aid in interpretation.<sup>306</sup> "The meaning of a word, including a word in a contract, is established by the reasonable understanding of those to whom the word is communicated."<sup>307</sup> Smith's third elucidation of the phrase describes the semantics of the agreement or the reasonable meaning of the contract language.<sup>308</sup> However, parties to a contract do not always use words literally and courts do not always apply the plain meaning rule.<sup>309</sup>

Superficially, Canadian common law jurisdictions and civil law Quebec are not entirely in agreement as to the role of "reasonable expectations" as an aid in interpreting contract terms and goals.<sup>310</sup> However, as a starting point, Hall notes that party intent remains the lodestar in contract interpretation in either; where conflict arises between parties' "reasonable expectations" and their intent, courts allow intent to trump.<sup>311</sup> In this way, common and civil law are similar. It is the role of the parties' "reasonable expectations" that differs. Civil law resists an economic analysis.<sup>312</sup> Instead of using

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<sup>305</sup> *Ibid.* at 6.

<sup>306</sup> *Ibid.* at 8.

<sup>307</sup> *Ibid.*

<sup>308</sup> *Ibid.* at 9 – 13.

<sup>309</sup> "The plain meaning rule...holds that it is not necessary to interpret a contract the language of which is considered to be 'clear' or 'plain'." Sebastien Grammond "Reasonable Expectations and the Interpretation of Contracts Across Legal Traditions" at 7.

<sup>310</sup> *Ibid.* at 10. Grammond calls the first "micro-intent," or "intent regarding specific clauses." The second he labels "meta-intent," which is intent concerning the contract as a whole. The former is determined in accord with the latter.

<sup>311</sup> G.R. Hall, "A Study in Reasonable Expectations" (2007) 45 C.B.L.J. 150, 155. Mr. Hall is the author of *Canadian Contractual Interpretation Law* (LexisNexis Canada Inc. 2007), an authoritative treatise on contract interpretation in Canada. .

<sup>312</sup> Grammond, *supra* note 309 at 8.

Economic analysis of law seeks to answer two basic questions about legal rules. Namely, what are the effects of legal rules on the behavior of relevant actors? And are these effects of legal rules

party expectations as an analytical tool motivating judicial decisions, they are instead looked at as an external after-the-fact explanation of those decisions.<sup>313</sup> On the other hand, common law courts can be more relaxed in approach, allowing “reasonable expectations” to figure prominently when imbuing contract terms with intended meaning and often resorting to economic analysis when parsing private agreements.<sup>314</sup>

The rules that have developed to aid in interpreting the parties’ intentions can be described as either formalistic, using a pre-determined “subset” of materials to divine contractual objectives, or substantive, using any and all information available to accomplish the task.<sup>315</sup> The trend has been toward substance, although variance can be found across jurisdictions. This can also be seen in the changes in judicial treatment of the need for consideration or the requirements for promissory estoppel, two doctrines that are currently given more latitude than in the past.<sup>316</sup> I posit that it is here, in the substantive rules, that interpretation of contractual meaning based on reasonable expectations falls.<sup>317</sup> A new formalism looks to the private rules and procedures supplied by trade organizations such as IATA (International Air Transport Association) or the

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socially desirable? In answering these positive and normative questions, the approach employed in economic analysis of law is that used in economic analysis generally: the behavior of individuals and firms is described assuming that they are forward looking and rational, and the framework of welfare economics is adopted to assess social desirability.

Louis Kaplow and Steven Shavell “Economic Analysis of Law” (February 1999) online:  
<[http://www.law.harvard.edu/programs/olin\\_center/papers/pdf/251.pdf](http://www.law.harvard.edu/programs/olin_center/papers/pdf/251.pdf)>(date accessed: 22 May 2009).

<sup>313</sup> *Ibid.* at 12.

<sup>314</sup> *Ibid.* at 8.

<sup>315</sup> Avery Wiener Katz “The Economies of Form and Substance in Contract Interpretation” *Columbia L Rev* Vol. 104, No. 2 (March 2004), 496 at 497 – 98.

<sup>316</sup> *Ibid.*

<sup>317</sup> Certainly, use of reasonable expectations as an organizing principle in contract interpretation, as Swan suggests in his *Canadian Contract Law*, would fall here. John Swan, *Canadian Contract Law*, 1<sup>st</sup> ed. (Markham, LexisNexis Canada Inc., 1006).

WTO (World Trade Organization), who are better suited to understand the issues in specialized markets.<sup>318</sup>

Katz recommends focus on private legal decision-makers instead of more traditional public ones, making a case for private ordering over either form or substance.<sup>319</sup> This approach ignores the reality that governments can, and almost always, do make decisions about the desirability of businesses that impact national security. While private parties may be in the best position to know what they want, judicial control through interpretation of contract is not the only form of possible governmental interference. Although usually done through legislation, governments can impose public order through regulation by contract, as in the contractual vehicles governing public-private partnerships.<sup>320</sup> While regulation of contract in commercial deals is rare, there is an embedded mechanism found in the granting or withholding of a license, based upon an applicant's contractual compliance with statutory requirements, as in a space based transaction.

Furthermore, inviting judicial interpretation or intervention to enforce contracts necessarily introduces a public element to the private order chosen by the parties. This is a mere step away from the conclusion that most contracts, once disputed, are no longer private agreements. As soon as the judiciary is involved, objective standards are introduced, external to the parties and often not aligned with their intent at contract inception. With an understanding that space agreements must withstand public scrutiny whether or not they ever reach a point of dispute, clarity becomes more paramount than

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<sup>318</sup> Lisa Bernstein "Private Commercial Law in the Cotton Industry: Creating Cooperation Through Rules, Norms and Institutions, 99 Mich. L. Rev. 1724 (2001).

<sup>319</sup> Katz, *supra* note 315 at 506.

<sup>320</sup> Peer Zumbansen "The law of society: governance through contract" Indiana J of Global Studies 14:2 (Summer 2007) 191.

in a purely private commercial transaction and the imposition of public order on private agreement is a given. This is not to say that public order will overshadow private intention in all facets of a space deal, only that the fact of some public intervention will be a reality irrespective of whether the parties end up in private dispute. The parties' must state their chosen methods of compliance with domestic and international regulation as well as their choices for contractual governance in a manner acceptable to the licensing and regulatory authorities. Because national security and state responsibility are implicated in all space deals, awareness of how private agreements fit into these public contexts is necessary, and the contracts should be entered into with that understanding.

### **Party Autonomy and Choice of Law**

While private law in many common law jurisdictions permits parties the autonomy to address choice of law issues by agreement, a subjectivist approach, this is not the only approach available.<sup>321</sup> For instance, some legal systems prefer to localize a contract, "to find its natural seat," and the appropriate law to apply would flow from that determination. Intent of the parties is but one factor used to divine the natural seat.<sup>322</sup>

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<sup>321</sup> North, *supra* note 225 at 172. One theory permits private ordering when the effects on private and social welfare are equivalent. Andrew T. Guzman arrives at the conclusion that effects on private and social welfare are equivalent by employing a formula measuring and comparing the direct and indirect effects of a transaction. Direct effects impact the parties to the transaction and are always positive since individuals, theoretically, only engage in activities that promote their own self interest. Indirect effects, on the other hand, are those that impact all third parties to the transaction located everywhere and can be positive or negative. To gauge the benefit to society, the effects are totaled. A positive sum represents a benefit; a negative evidences detriment. In a purely private business deal, there would be direct effects but no indirect effects, resulting in a positive sum, hence a benefit. However, this analysis falls short in the space context because Article VI of the OST imputes ultimate responsibility for private space actors onto the states involved. An argument could be made that no space activity is totally private. However, if it is only the parties to a transaction that will be affected, they are in a better position to determine which legal regime best assists the deal. Guzman, *supra* note 224.

<sup>322</sup> North, *supra* note 225 at 181.

The Rome Convention of 1980, amended in 1996, now substantially governs choice of law rules for members of the European Union.<sup>323</sup> Article 3(1) allows parties complete freedom or autonomy to choose the law applicable to a contract, as long as public order provisions of the law of the forum are not violated.<sup>324</sup> A limitation to this freedom is that it is not available in purely domestic cases.<sup>325</sup> The choice can be achieved either expressly or by implication if the parties' intentions can be demonstrated with reasonable certainty from the contract terms.<sup>326</sup>

Perhaps one of the most significant features of the Convention is its permission for parties to choose an entirely new law to be applied (not an either/or choice between the law of the parties, but all parties agreeing on the application of different law). This makes it much easier to facilitate a deal when the governing law of the involved states is in sharp contrast, but requires compliance with the space treaties as a minimum standard. For instance, the Liability Convention outlines degrees of liability to third parties based upon the location of a damaging event. The parties to a contract can apportion the liability among themselves, but cannot absolve themselves of liability completely, or leave an injured party with no recovery or a lesser recovery than would be available

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<sup>323</sup> *Convention on the Law Applicable to Contractual Obligations*, opened for signature in Rome, Italy on 19th June 1980.

<sup>324</sup> Athanassios N. Yiannopoulos *Ocean Bills of Lading: Traditional Forms, Substitutes, and EDI Systems* (Martinus Nijhoff Publishers, 1995) 103.

According to Article 6(1) of the Convention, the choice of law made by the parties must not have the result of depriving the employee of the protection afforded to him by the mandatory rules of the law which would be applicable under paragraph 2 of that Article in the absence of choice.

Article 7 provides that, under certain conditions, effect may be given, concurrently with the law declared applicable, to the mandatory rules of the law of another country...

*Communication from the Commission to the Council, the European Parliament, the Economic and Social Committee and the Committee of the Regions: The implementation of Directive 96/71/EC in the Member States* Brussels, 25 July 2003 COM(2003) 458 final at 4.

<sup>325</sup> Gisela Rühl *Party Autonomy in the Private International Law of Contracts: Transatlantic Convergence and Economic Efficiency* in *CONFLICT OF LAWS IN A GLOBALIZED WORLD*, eds. Eckart Gottschalk, et al. (Cambridge University Press, 2007) at 9.

<sup>326</sup> Murat Hetin Hakki "The European Union's Conflict of Law Rules Governing Contract Law – A Re-evaluation" *Murdoch University Electronic Journal of Law* Vol 1 No. 1 (March 2003) at ¶12.



under the Treaty. To that end, the parties cannot choose a forum that does not recognize strict or absolute liability since the treaty extends this to third parties injured on the earth's surface or in the air.

The United States Supreme Court has also sanctioned party autonomy in contractual choice of law,<sup>327</sup> with a caveat similar to the public order limitations found in the Rome Convention, although framed in public policy terms. "Except as forbidden by some public policy, the tendency of the law is to apply in contract matters the law which the parties intended to apply."<sup>328</sup> In 2001, the American Law Institute and the National Conference of Commissioners on Uniform State Law completed revision of Article 1 of the Uniform Commercial Code (UCC) and promulgated the new version for adoption by the states.<sup>329</sup> The more recent provision, §1-301, expanded choice of law. Former section 1-105 restricted party autonomy by limiting the parties' choice of law to the law of a state to which their transaction bore a reasonable relationship, while the revision allowed commercial parties to choose the law of any state or nation unless the choice would contravene a fundamental policy of the jurisdiction whose law would otherwise apply.<sup>330</sup> The newer version more closely resembled the party autonomy found in the Rome Convention. However, while revised Article 1 is in effect in thirty-four states, the

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<sup>327</sup> *Volt Information Sciences, Inc. v. Bd. of Trustees of Leland Stanford Junior University*, 489 U.S. 468, 491 (1989) (citing Scoles & Hay, *Conflict of Laws*, at 632-633 "Party autonomy means that the parties are free to select the law governing their contract, subject to certain limitations. They will usually do so by means of an express choice-of-law clause in their written contract"). *Lauritzen v. Larsen*, 345 U.S. 571, 588 – 89 (1953). The United States Supreme Court continued to follow the precedent set in *Lauritzen* in *Romero v. Int'l Terminal Operating Co.*, 358 U.S. 354 (1959), and *Hartford Fire Ins. Co. v. California*, 509 U.S. 764, 812 (1993).

<sup>328</sup> *Lauritzen* 345 U.S. at 588 – 89. See also *Conflict of Law. Choice of Law in Contracts. Intent of the Parties. Renvoi* *Columbia Law Review Vol. 40 No.3* (March 194) 518 – 23, 521. The caveat that party autonomy is subject to public policy considerations can be traced to *Vita Foods Products Inc. v. Unus Shipping Co.*, [1939] A.C. 277 (P.C.), a case out of Newfoundland, Canada that dealt with a shipment from Nova Scotia to Newfoundland, which was separate from Canada at the time of the decision.

<sup>329</sup> Jack M. Graves "Party Autonomy in Choice of Commercial Law: The Failure of Revised U.C.C. § 1-301 and a Proposal for a Broader Reform" (2005) 36 *Seton Hall Law Review* 59.

<sup>330</sup> *Ibid.* at 60 – 61.

expansion of autonomy has proven to be an obstacle as all adopting states have chosen to substitute pre-revision article 1-105.<sup>331</sup> As a result, the American Law Institute promulgated a substitute § 1-301 which reverts back to the language of its predecessor for choice of law.<sup>332</sup>

One commentator notes that the American system and the continental, or civil, system in Europe have been converging in the latter part of the 20<sup>th</sup> century and the beginning of the 21<sup>st</sup>.<sup>333</sup> For instance, both systems require a connection to foreign law and party choice is not available for purely domestic situations. Even where the European and American systems are different, as in the Rome Convention's allowance of party choice unrelated to the chosen law as opposed to the US requirement for such a

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<sup>331</sup> Keith A. Rowley "UCC Legislative Update" available at: <http://www.abanet.org/buslaw/committees/CL190000pub/newsletter/200901/subcommittees/developments.pdf> <date accessed: 5 March 2009>; Graves at 60. Of the thirty four, only the Virgin Islands, a territory and not a state, has adopted §1-301. "Proposal to Amend Official Text of § 1-301 (Territorial Applicability; Parties' Power to Choose Applicable Law) of Revised Article 1 of the UCC" online:<<http://www.ali.org/doc/uccamendment.pdf>>(date accessed: 5 March 2009).

<sup>332</sup> The ALI acknowledges that its mandate differs when drafting a uniform code as opposed to when drafting restatements and principles since the goal for the former is uniformity and enactability. As the states were uniform in both rejecting the first version of §1-301 and accepting the old §1-105, the original language of §1-105 was adopted in the amended §1-301, with only stylistic changes. ALI Proposal, *supra* note 325 at 13. The text of the new and improved §1-301 is:

§ 1-301. Territorial Applicability; Parties' Power to Choose Applicable Law.

(a) Except as otherwise provided in this section, when a transaction bears a reasonable relation to this state and also to another state or nation the parties may agree that the law either of this state or of such other state or nation shall govern their rights and duties.

(b) In the absence of an agreement effective under subsection (a), and except as provided in subsection (c), [the Uniform Commercial Code] applies to transactions bearing an appropriate relation to this state.

(c) If one of the following provisions of [the Uniform Commercial Code] specifies the applicable law, that provision governs and a contrary agreement is effective only to the extent permitted by the law so specified:

- (1) Section 2-402;
- (2) Sections 2A-105 and 2A-106;
- (3) Section 4-102;
- (4) Section 4A-507;
- (5) Section 5-116;
- [(6) Section 6-103;]
- (7) Section 8-110;
- (8) Sections 9-301 through 9-307.

<sup>333</sup> Rühl, *supra* note 325.

relationship, the absence of a substantial relationship can be circumvented by other reasonable bases for the parties' choice.<sup>334</sup> An example would be where the parties execute and perform the contract in a state with a relatively undeveloped system of law.

Furthermore, US courts have relaxed the standards for finding a substantial relationship to the chosen law.<sup>335</sup> For instance, substantial relationships are found when parties chose the law of the state where the contract is made or performed; where one of the parties is domiciled, incorporated, or has his or her principal place of business; or where there is some small nexus to the foreign state, such as a contractual assignment to a business there.<sup>336</sup> Lastly, both the Rome Convention and US law exclude choice of a non-state body of law unless in the form of extrinsic materials incorporated by reference into the contract.<sup>337</sup> These would include recognized bodies of rules or principles applicable to commercial transactions, such as the UNIDROIT Principles of International Commercial Contracts, discussed in more detail later in this chapter.

Other states outside of the EU and the US allow varying degrees of party autonomy. In a case coming out of the civil law jurisdiction of Quebec, *Scierie Thomas-Louis Tremblay inc. c. J.R. Normand inc.* (known as GreCon), the Supreme Court of Canada found that "the autonomy of the parties' will is a basic principle that plays a predominant role in the development of the rules governing the jurisdiction of the [ ] courts. It underlies art. 3148, par. 2, which constitutes, in situations of conflicts of jurisdiction, the cornerstone of a legislative policy of respect for the autonomy of the

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<sup>334</sup> Restatement (Second) Conflict of Laws § 187, cmt. f.

<sup>335</sup> Rühl *supra* note 325 at 12 – 13.

<sup>336</sup> *Ibid.* (citing *Evans v. Harry Robinson Pontiac-Buick, Inc.*, 983 S.W.2d 946 (Ark. 1999)).

<sup>337</sup> *Ibid.* at 18.

parties.”<sup>338</sup> The Civil Code is deterministic and defers to parties’ choice of law. In the absence of express choice, a Quebec court will look at listed factors found in articles 3149 or 3164-65, applying the same criteria to foreign courts that it applies to its own.<sup>339</sup>

In Canada’s common law jurisdictions, “in the absence of express or implied choice that must be bona fide, legal, and not intended to evade the mandatory provisions of the system of law with which the transaction objectively is most closely and really connected, the courts have applied the proper law of the contract to its essential validity, interpretation, effect, and performance. The proper law is the system of law with which the transaction has the closest and most real connection.”<sup>340</sup> Both civil and common law jurisdictions respect the parties’ choice of law designated in a juridical act.

Nigeria, a common law state,<sup>341</sup> allows parties to negotiate choice of law provisions, as long as the transactions are “real, genuine, bonafide [sic], legal, and

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<sup>338</sup> [2005] 2 S.C.R. 401. The actual language of C.C.Q. 3148 is:

3148.

In personal actions of a patrimonial nature, a Quebec authority has jurisdiction where

3148(1)

the defendant has his domicile or his residence in Quebec;

3148(2)

the defendant is a legal person, is not domiciled in Quebec but has an establishment in Quebec, and the dispute relates to its activities in Quebec

3148(3)

a fault was committed in Quebec, damage was suffered in Quebec, an injurious act occurred in Quebec or one of the obligations arising from a contract was to be performed in Quebec;

3148(4)

the parties have by agreement submitted to it all existing or future disputes between themselves arising out of a specified legal relationship;

**3148(5)**

**the defendant submits to its jurisdiction.**

**However, a Quebec authority has no jurisdiction where the parties, by agreement, have chosen to submit all existing or future disputes between themselves relating to a specified legal relationship to a foreign authority or to an arbitrator, unless the defendant submits to the jurisdiction of the Quebec authority.** (emphasis added)

<sup>339</sup> C.C.Q. Arts. 3149, 3164 - 65.

<sup>340</sup> Jean-Gabriel Castel “The Uncertainty Factor in Canadian Private International Law” (2007)52 McGill L J 555, 558, 563.

<sup>341</sup> Dennis Campbell *Remedies for International Sellers of Goods - Volume ii* (Lulu.com, 2006) at 663.

reasonable,”<sup>342</sup> and will infer the parties’ intent when not express, using factors and surrounding circumstances to determine it.<sup>343</sup>

On the other hand, China, not a common law jurisdiction, recently issued Provisions modifying its previously lenient policy allowing parties to contractually choose the law governing the agreement.<sup>344</sup> Still permitted in some cases, the new ruling expands the scope of pre-existing statutory provisions that mandate the application of Chinese law to commercial contract disputes, despite an express choice of law clause, and also provide guidance when parties fail to articulate a choice of law. In addition, the Provisions supply rules for determining the governing law for seventeen different kinds of contracts.<sup>345</sup> Taiwan has internalized Western civil code principles including contractual autonomy.<sup>346</sup> Thailand, also a civil law jurisdiction, recognizes party autonomy in choice of law.<sup>347</sup>

Historically, although India has allowed parties the freedom to choose the law governing the contract, the rules of private international law are not well developed under Indian law and few cases have been heard by Indian courts.<sup>348</sup> Further, the cases that

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<sup>342</sup> Adewale Atake “Nigeria: Enforcing Choice of Law Clauses in Nigeria: [Pacta (will not be) Sunt Servanda] – Where The Transaction is Illegal” 2 November 2004 (citing *Sonnar (Nig.) Ltd. v. Partenreedri M.S. Nordwind*, (1967) NWLR (pt.66) 520) online:<<http://www.mondaq.com/article.asp?articleid=25493>>(date accessed: 16 December 2008). These articulated requirements also echo the public order/public policy provisos described in this section.

<sup>343</sup> Atake, *supra* note 346 at 662.

<sup>344</sup> “China’s highest court rules on the choice of law for foreign-related contracts” (15 August 2007) online:<<http://www.mallesons.com/publications/2007/Aug/9068787w.htm>>(date accessed: 16 December 2008); *see also* Zhang, *supra* note 306 at 289.

<sup>345</sup> China highest court rules, *supra* note 348.

<sup>346</sup> Yin-Ching Chen “Civil Law Development: China and Taiwan” (Spring 2002) 2 Stanford J of East Asian Affairs 8.

<sup>347</sup> Prasit Pivavatanapanich “Choice of Law in Contract and Thai Private International Law: A Comparative Study” Thailand Law Forum, online:<<http://www.thailawforum.com/articles/choiceoflaw.html>>(date accessed: 9 February 2009).

<sup>348</sup> Pravin Anand, Anand and Anand, World Intellectual Property Organization (WIPO) *Ad Hoc Informal Meeting on the Protection of AudioVisual Performances* Geneva, 6 and 7 November 2003 AVP/IM/03/4E at 9.

have gone before the courts have had mixed results; some courts have avoided ruling in disputes governed by non-Indian law, despite the fact that the Indian court had jurisdiction.<sup>349</sup> Indian courts have utilized a balancing test, weighing the balance of convenience against the law applicable, in determining where a dispute should be decided.<sup>350</sup>

Islamic law is adaptable to the realities of modern transactions but is guided by the state of the time, public interest, and shari'a.<sup>351</sup> However, some subtle issues arise with regard to choice of law. First, while Islamic law allows parties some autonomy to choose choice of law, there are strict limitations imposed. Islamic courts will only apply Islamic law.<sup>352</sup> A contract can include a "choice of law" provision or "governing law clause" naming an Islamic country's law and a forum selection clause choosing a non-Islamic venue. The chosen forum will apply its own test to determine the validity of the governing law clause. For instance, in *McGhee v. Arabian American Oil Co.*,<sup>353</sup> a federal appeals court in California was confronted with claims for wrongful termination and related torts. While the breach of contract causes were clearly governed by Texas law as

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<sup>349</sup> "The Choice of Law in Contracts: High Court Cases" (26 June 2006) online:<<http://lawmatters.in/content/the-choice-of-law-in-contracts-413>>(date accessed: 16 December 2008).

<sup>350</sup> *Union of India v. Navigation Maritime Bulgare* (AIR 1960 Cal 545).

<sup>351</sup> Noor Mohammed "Principles of Islamic Contract Law" *Journal of Law and Religion* Vol. 6 No. 1 (1988) 1115 – 130 at 126. Shari'a is the overriding spirit of Islamic law. Sharia prohibits riba (usury) and gharar (uncertainty or speculation of any kind). The "state of the time" refers to "the traits exhibited by the idealized Islamic state of the time of the Prophet and the first generation of Muslims." Mohammed Ayoob *The many faces of political Islam: religion and politics in the Muslim world* (University of Michigan Press, 2007) at 66.

<sup>352</sup> "Judges [in Saudi Arabia] are obliged to apply the Islamic shari'a in accordance with the Hanbali school of jurisprudence." Yahya Al-Samaan "The Legal Protection of Foreign Investment in the Kingdom of Saudi Arabia" (1st ed. 2000) (Dar Al-Andalus for Publishing and Dist., Hail Saudi Arabia) at 219. The civil codes in various Islamic countries vary from shari'a. Frank E. Vogel and Samuel L. Hayes, III "Islamic Law and Finance: Religion, Risk, and Return (The Netherlands: Kluwer Law Int'l, 1998) 50 -52.

<sup>353</sup> 871 F.2d 1412 (Ninth Cir. 1989).

per the express provisions of the employment contracts at issue,<sup>354</sup> the tort claims required the court to apply the governmental interest test.<sup>355</sup> This analysis resulted in application of Saudi Arabian law to those claims sounding in tort. Under Saudi Arabian law, most of the tort claims failed.

In a federal trial decision in New Jersey, parties agreed that Saudi law governed the contractual dispute.<sup>356</sup> The provision named “the regulations in force in the Kingdom of Saudi Arabia” as the law governing the contract.<sup>357</sup> The court was able to determine that the subcontractor would not be entitled to recover value of liquidated projects department beyond the actual loss in value of department’s existing assets because allowing for further relief would violate the prohibition against “gharar”.<sup>358</sup> The court was able to look to the tenets of shari’a for this determination because “Islam permeates every aspect of life in the Kingdom of Saudi Arabia, including its legal structure.”<sup>359</sup> The “Basic Regulation of the Kingdom of Saudi Arabia” states that “Rule in the Kingdom of Saudi Arabia draws its authority from the Book of God Most High and the Sunna of His Prophet” and that “courts shall apply in cases brought before them the rules of the Islamic *shari’a*.”<sup>360</sup>

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<sup>354</sup> However, Texas law allowed incorporation of Saudi law by reference as per the contracts. *Ibid.* at 1416-17.

<sup>355</sup> *Ibid.* at 1422.

<sup>356</sup> *National Group for Communications and Computers Ltd. v. Lucent Tech. Int’l Inc.*, 331 F.Supp.2d 290 (D. N.J. 2004).

<sup>357</sup> The provision read as below:

This Subcontract is subject to the regulations in force in the Kingdom of Saudi Arabia. Interpretation execution of the Subcontract and settlement of claims arising therefrom shall be subject to and in accordance with the said regulations.

*Ibid.* at 293.

<sup>358</sup> “Future activity is deemed gharar because it is uncertain to anyone except for God.” *Ibid.* at 295.

<sup>359</sup> *Ibid.* at 295.

<sup>360</sup> *Ibid.* at 295.

This is a vastly different result than found in an English appellate case, *Beximco Pharmaceuticals Ltd. v. Shamil Bank of Bahrain*,<sup>361</sup> There, the parties named two governing laws of the contract at issue – the laws of England subject to a proviso that those laws should be subject to the “principles of the glorious shari’a.”<sup>362</sup> The court found the two incompatible. Further, the Rome Convention allows only choice of law of a country or state. Recognizing that it would be possible to incorporate by reference the principles of shari’a into the contract, the court held that

The doctrine of incorporation can only sensibly operate where the parties have by the terms of their contract sufficiently identified specific ‘black letter’ provisions of a foreign law or an international code or set of rules apt to be incorporated *as terms of the relevant contract* such as a particular article or articles of the French Civil Code or the Hague Rules.<sup>363</sup>

The court found the proviso lacked the requisite specificity necessary to incorporate by reference. Almost all contracts that choose Islamic law as governing also include a provision for commercial arbitration.<sup>364</sup> Islamic countries recognize the validity of arbitration clauses.<sup>365</sup> No matter what, it is clear that care must be taken to ensure that the domestic law of each participant allows party autonomy to choose which law should govern the transaction and that the chosen law will also allow that choice.

### **The New, New *Lex Mercatoria***

The previous discussion of incorporation by reference is a logical segue into discussion of the new, new *lex mercatoria* and the UNIDROIT Principles of International Commercial Contracts (UPICC). Not a new concept, *lex mercatoria*

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<sup>361</sup> [2004]1 C.L.C. 216.

<sup>362</sup> *Ibid.* at 217.

<sup>363</sup> *Ibid.* at 233.

<sup>364</sup> Vogel and Hayes, *supra* note 356 at 51.

<sup>365</sup> Arthur J. Gemmell “Commercial Arbitration in the Islamic Middle East” 5 Santa Clara J of Int’l Law 1 (2006).



represents a “set of legal norms, procedures, and institutions outside the state and its institutions...created in, by, and for commerce, independent from the state.”<sup>366</sup> As explained by Ralf Michaels, a commentator on the subject, there are three stages of the evolution of *lex mercatoria* over time.<sup>367</sup>

The first stage concerns an ancient *lex mercatoria* in the Middle Ages, a transnational set of norms and procedural principles, established by and for commerce in (relative) autonomy from states. The second stage describes the renaissance of the idea as a “new *lex mercatoria*” in the 20<sup>th</sup> century, an informal and flexible net of rules and arbitrators establishing a private international commercial law. Finally, a third stage has been described as a “new new *lex mercatoria*,” which moves from an amorphous and flexible soft law to an established system of law with codified legal rules (first and foremost the UNIDROIT Principles of International and Commercial Law) and strongly institutionalized court-like arbitration.<sup>368</sup>

The first chapter established the transnational nature of space business. The second chapter describes the legal regime with which space commerce must comply. It is a system that begins by assigning to states ultimate responsibility for the space-based conduct of their nationals. While the current global political system continues to segment states from one another despite the fact that they perform largely the same functions as one another, the global economy represents a functional differentiation that recognizes only the boundaries between different economic sectors.<sup>369</sup> “Commercial law ... is the first part of the law which leaves behind its state-based structure and adopts instead the structure of the economic system.”<sup>370</sup>

Enter the new, new *lex mercatoria*. One of the more noteworthy features of *lex mercatoria* at any of its evolutionary stages is its ability to self regulate. It is this

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<sup>366</sup> Michaels, *supra* note 52 at 448.

<sup>367</sup> *Ibid.*

<sup>368</sup> *Ibid.* at 448 (citations omitted).

<sup>369</sup> *Ibid.* at 465. That said, in a 1949 case, *Reparations for Injuries*, the International Court of Justice appeared to have sounded the death knell to the ideology that saw states as the only subjects of international law. [1949]I.C.J. Rep, 174.

<sup>370</sup> *Ibid.* at 465.

characteristic of the currently developing cyberlaw that invites its inclusion in the new, new *lex mercatoria*.<sup>371</sup> Another salient feature of *lex mercatoria* is its focus on private transactions, very timely as non-state actors become more important in the international arena.<sup>372</sup> Space commerce is but one aspect of this trend. The newest version of this ancient concept includes UNIDROIT Principles, which do not have the force of law in any country, but have served as models for the creation and rebuilding of civil codes in countries such as the Netherlands, Hungary, Russia, Lithuania, Estonia, China, and some African countries.<sup>373</sup>

The UNIDROIT Principles have been regarded as codification of *lex mercatoria*.<sup>374</sup> The goal is uniformity and, therefore, certainty by establishing general rules of international commercial contracts.<sup>375</sup> Clearly this is an admirable objective, and, as established even within the confines of this paper, an aspiration that should facilitate efficient business. The Preamble sets forth the purposes of the UNIDROIT Principles:

*(Purpose of the Principles)*

These Principles set forth general rules for international commercial contracts. They shall be applied when the parties have agreed that their contract be governed by them.

They may be applied when the parties have agreed that their contract be governed by "general principles of law," the "lex mercatoria" or the like.

They may provide a solution to an issue raised when it proves impossible to establish the relevant rule of the applicable law.

They may be used to interpret or supplement international uniform law

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<sup>371</sup> Elizabeth Rindskopf Parker review of Teresa Fuentes-Comacho "The International Dimensions of Cyberspace Law" American J of Int'l Law 96:2 (April 2002) 510-14, 511.

<sup>372</sup> Galf-Peter Calliess "Lex Mercatoria: A Reflexive Law Guide to An Autonomous Legal System" 2:17 German L.J *Legal Culture* (1 November 2001), presented at the CENTRAL Conference "Transnational Business in the Age of Globalization" in Muenster, Germany, on 26 October 2001 online:<<http://www.germanlawjournal.com/article.php?id=109>>(date accessed: 25 March 2009).

<sup>373</sup> Maren Heidemann "Methodology of Uniform Contract Law: The UNIDROIT Principles in International Legal Doctrine and Practice" (2007) (Springer Verlag: Heidelberg) at 4.

<sup>374</sup> Michaels, *supra* note 52 at 457.

<sup>375</sup> Heidemann, *supra* note 377 at 40; Berger, *supra* note 183.

instruments.

They may serve as a model for national and international legislators.

The Principles do not provide a standardized contract but a flexible set of rules that can adapt to the circumstances of the parties. Often, they are used in arbitration. However, as explained in the immediately preceding section, how the parties express their preference for the UNIDROIT Principles is of paramount importance. Courts will only recognize the UNIDROIT Principles as the law governing the contract if its terms are incorporated by reference, while arbitral tribunals are more flexible. Despite the Principles' ambition to transcend state-based systems, because the UNIDROIT Principles do not represent the laws of a state, they cannot be included in a simple choice of law provision, but must instead be incorporated into the contract with specificity. In other words, if the parties choose to resolve disputes through arbitration and the UNIDROIT Principles are their chosen rules, then they may simply state that. If, however, the parties choose a court to adjudicate disputes, then choice of the UNIDROIT Principles must be more specific, incorporating the precise articles by stated reference.

This requirement is congruent with the essential fact that all space transactions, whether the participants be private actors or states or state agencies, are ultimately the responsibility of the state of registry, which must, by treaty mandate, exert continuing jurisdiction and control. As a result, commercial space activity cannot exist outside of a state-based regime and no space transaction can be truly private or be a full participant in *lex mercatoria*.<sup>376</sup>

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<sup>376</sup> On the other hand, space money, separate from the currency systems of states on Earth, has been proposed by Travelex. The Quasi Universal Intergalactic Denomination (QUID) is to be specially engineered for the space environment. The proposal opens the door to a host of legal questions, starting with whether currency in space is a space activity requiring continued jurisdiction and control, and, if so, whose. P.J.Blount "Space Money and Space Law" Res Communis (22 October 2007)

## **Dispute Resolution**

The Liability Convention provides for non-adversarial settlement of disputes not settled through diplomatic channels.<sup>377</sup> However, only states can bring a claim under the Convention. Alternatively, disputes have been resolved through the courts, arbitration, or mediation.

The UN Model Law on International Commercial Arbitration, drafted by the United Nations Commission on International Trade Law (UNCITRAL), defines the principal requirements, or elements, of dispute resolution by arbitration.<sup>378</sup> They are: 1) an agreement by the parties, 2) to submit all or certain disputes to arbitration, 3) which have arisen or may arise out of a defined legal relationship between them, 4) whether these disputes are contractual or not.<sup>379</sup> Only those claims arising out of a defined legal relationship are covered by the arbitration agreement. Usually, the agreement refers to claims “which arise out of or in connection with this contract.”<sup>380</sup> This language is sufficient to include all issues associated with the contract’s conclusion, validity, interpretation, performance, damages, and termination.<sup>381</sup> Tort claims may be covered if they bear some nexus to the performance of the parties’ contractual obligations.<sup>382</sup>

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online:<[http://rescommunis.wordpress.com/2007/10/22/space-money and space-law/](http://rescommunis.wordpress.com/2007/10/22/space-money-and-space-law/)>(date accessed: 5 September 2008).

<sup>377</sup> Liability Convention, *supra* note 2 Articles XIV – XX,. Article XIV reads:

If no settlement of a claim is arrived at through diplomatic negotiations as provided for in article IX, within one year from the date on which the claimant State notifies the launching State that it has submitted the documentation of its claim, the parties concerned shall establish a Claims Commission at the request of either party.

<sup>378</sup> Klaus Peter Berger “The Nature of the International Arbitral Process” Understanding Transnational Commercial Arbitration (edited by the Center for Transnational Law 2000) UTCARB 1.II.

<sup>379</sup> *Ibid.*

<sup>380</sup> Klaus Peter Berger “The Limits of the Arbitral Process: a. Substantive limits” Understanding Transnational Commercial Arbitration (edited by the Center for Transnational Law 2000) UTCARB 1.II.2.a.

<sup>381</sup> *Ibid.*

<sup>382</sup> *Ibid.*

Arbitration agreements are usually in the form of a clause in the contract that sets forth the parties' rights and responsibilities. They are recognized globally and favored in some jurisdictions.<sup>383</sup> While the International Chamber of Commerce in Paris (ICC) recommends that parties referencing ICC arbitration in their contracts use model language,<sup>384</sup> not all parties share the same priorities for their dispute resolution. In drafting an arbitration clause, the same principles apply that are applicable to good drafting in general. Simplicity is a good starting point. If the parties have a specific tribunal in mind, then it is necessary to ensure that the provision's language meets that tribunal's requirements and is compliant with its rules.<sup>385</sup> The arbitration clause gives the parties latitude to choose the arbitrator selection process and set arbitrator qualifications, determine whether and what discovery is available, what rules apply (evidentiary and procedural), scheduling, level of confidentiality, the role the arbitrators will serve, decision format and whether binding, the appeal process if any, choice of law, provisional remedies, and methods of enforcement.<sup>386</sup> Often, a contract choosing the UNIDROIT Principles as the contract's governing law also includes an arbitration clause. There is a

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Section 2 of the FAA [Federal Arbitration Act] states:

'A written provision in any ... contract evidencing a transaction involving commerce to settle by arbitration a controversy thereafter arising out of such contract or transaction ... shall be valid, irrevocable, and enforceable, save upon such grounds as exist at law or in equity for the revocation of any contract.' 9 U.S.C. § 2.

Section 2 "declare[s] a national policy favoring arbitration" of claims that parties contract to settle in that manner. *Southland Corp.*, 465 U.S., at 10, 104 S.Ct. 852.

*Preston v. Ferrer*, 128 S.Ct. 978, 983 (2008).; For an in depth discussion of Canadian arbitration across the provinces, see Jean-Gabriel Castel "The enforcement of agreements to arbitrate and arbitral awards in Canada" *Canada-United States Law Journal* 17 (Jan. 1991) 491.

<sup>384</sup> The ICC model arbitration clause is:

All disputes arising out of or in connection with the present contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules.

Online:<<http://madaan.com/arbitrationicc.html>>(date accessed: 13 March 2009).

<sup>385</sup> Gary H. Barnes "Drafting an Arbitration Clause – A Checklist" HG.org: Worldwide Legal Directories online:<<http://www.hg.org/adradd1.html>>(date accessed: 13 March 2009).

<sup>386</sup> *Ibid.*

complex interplay between arbitration providers and arbitration clauses; at times, the chosen provider will not enforce other negotiated terms of the arbitration agreement because of conflicts with provider rules.<sup>387</sup> As a result, even simple clauses can have complicated results.

Mediation, like both arbitration and adjudication, also employs neutral third parties.<sup>388</sup> However, the mediator does not issue a binding decision. The procedures are less structured and more flexible than those followed by either courts or arbitral tribunals.<sup>389</sup> Mediation can be entirely consensual or it can be court ordered.<sup>390</sup>

### **Risk Allocation**

Traditionally, as in commercial undertakings in a wide variety of scenarios, exposure to liability in a space transaction is handled by the allocation of a particular risk to the party or parties best suited to manage it at the least cost. This is true in ventures whether they be private or public, or some combination thereof.<sup>391</sup> Often, risk is allocated by the procurement of insurance coverage.

The insured and the insurer negotiate the terms of the coverage as set forth in the insurance contract. Certainty of terms in insurance contracts has been a focus of the

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<sup>387</sup> W. Mark C. Weidemaier “The Arbitration Clause in Context: How Contract Terms Do (and Do Not) Define the Process” (2006 – 2007) 40 Creighton L. Rev. 655 at 660.

<sup>388</sup> Sarah R. Cole, et al. “Mediation: Law, Policy and Practice” § 1:1 (2d ed.)

<sup>389</sup> For a good, if amorphous, definition of mediation, see  
online:<<http://terryharris.com/Mediation%20Definition.htm>>(date accessed: 25 March 2009).

<sup>390</sup> Deborah Lynn Zutter “Incorporating ADR in Canadian Civil Litigation” (2001) 13 Bond L Rev. Issue 2, article 11, online:< <http://epublications.bond.edu.au/cgi/viewcontent.cgi?article=1215&context=blr>>(date accessed: 25 March 2009); Edward P. Davis, Jr. “Mediation in the US Legal System” The Institute for the Study and Development of Legal Systems”  
online:<[http://www.isdls.org/authoritative\\_papers\\_mediationdavis.html](http://www.isdls.org/authoritative_papers_mediationdavis.html)>(date accessed: 25 March 2009).

<sup>391</sup> Allocation of risk is a necessary factor in setting up public-private partnerships. Online: The Canadian Council for Public-Private Partnerships < [http://www.pppcouncil.ca/aboutPPP\\_definition.asp](http://www.pppcouncil.ca/aboutPPP_definition.asp)> (date accessed on 20 April 2008).

Financial Services Authority (FSA) in the United Kingdom for several years.<sup>392</sup> The FSA allowed the insurance market time to ensure that insurance contract terms are agreed to at the time the contracts commence, with the goal being greater certainty for buyers as to what they have purchased and for insurers as to what risks they are covering. In 2007, the FSA announced that 88 – 90% of insurance contracts in the United Kingdom were achieving contract certainty.<sup>393</sup>

Insurance can be obtained by the satellite owner (the exception), launch suppliers (the rule), or the satellite operator.<sup>394</sup> Producers, launching states or related organizations may be co-insured. The launch pad and damage to the payload are usually not covered by insurance but managed by cross-waivers of liability.<sup>395</sup>

The timeline of coverage begins during the preparation for launch, considered a time of high risk.<sup>396</sup> This is usually the responsibility of the launch service provider along with the highly risky lift-off. In-orbit operations of a satellite usually fall to the satellite operator, with the risk decreasing after the first year. Coverage for re-entry is also available. Basically, the timeline runs from delivery of the space craft to the launch

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<sup>392</sup> “FSA announces next steps on contract certainty in the insurance market” (20 March 2006) online:<[http://www.insurance-business-review.com/article\\_news.asp?guid=7EC79675-E050-4282-98E5-C54610A5391](http://www.insurance-business-review.com/article_news.asp?guid=7EC79675-E050-4282-98E5-C54610A5391)>(date accessed: 12 March 2009).

<sup>393</sup>“FSA Lauds UK Insurers for Achieving 90% Contract Certainty” (25 January 2007) Insurance Journal, online:<<http://www.insurancejournal.com/news/international/2007/01/25/76276.htm>>(date accessed: 13 March 2009).

<sup>394</sup> The operator is often added by the launch service provider as an additional named insured. Sometimes the operator purchases in-orbit third party cover which comes into operation when the launch coverage expires. Operators and insurers would like to see manufacturers assume more financial responsibility for the performance of hardware. Peter B. de Selding “Buyers, Insurers Want Satellite Makers to Take on More Financial Risk” Space News (18 April 2005).

<sup>395</sup> These can apply even with a finding of gross negligence.

<sup>396</sup> Nesgos, *supra* note 178.

pad until either the expiration date of the policy or the destruction of the satellite, whichever occurs first. Contracts can be extended to the end of a satellite's life.<sup>397</sup>

Space insurance encompasses a number of different covers and markets.<sup>398</sup> Loss of or damage to the satellite itself is placed in a highly specialized international insurance market, and includes the launch and in-orbit phases. Coverage can be had for total loss, constructive total loss, or partial loss of the space asset, including loss of operational capacity and, sometimes, loss of revenues, on an all-risks basis.<sup>399</sup>

Historically, space insurers have shied away from coverage of liabilities between participants in a project for failure or malfunction of a space service and performance shortfalls, instead requiring cross waivers of liability and "hold harmless" agreements within the limits allowed by domestic law and the floor set by the international treaties.<sup>400</sup>

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<sup>397</sup> Actually, the timeline for coverage in space is very similar to that found in the construction industry, where coverage is broken out into three phases: pre-construction, construction, and operational. Online:<<http://www.bbiofuels.com/biofuelsworkshop/2006/docs/speakerpapers/west/pd/BWW06-PD-12-Grace.pdf>>(date accessed 17 December 2008).

<sup>398</sup> "Covers" is a term of art in insurance and widely used to refer to a contract for insurance or a type of coverage. Online:<<http://www.aami.com.au/customer-service/insurance-glossary.aspx#cc>>(date accessed: 28 February 2009).

<sup>399</sup> The total premium for 2007 was estimated at \$ 500-550M US,<sup>399</sup> while the first two quarters of 2008 garnered approximately \$411M US in premiums. "Aon, Inmarsat in Space Partnership" "Insurance Journal" online:<<http://www.insurancejournal.com/news/international/2008/09/19/93857.htm>>(date accessed: 17 October 2008). In the face of short-term policies, exorbitant rates, and disputed terms, some satellite operators chose to rely on self insurance in the early 2000's. Michael A. Taverna, "Back in Business: As private equity influence wanes, satellite operators turn again to space insurance market" *Aviation Week & Space Technology* (23 April 2007)26 - 27. However, in 2007, companies appeared to reconsider more traditional risk management. New coverage, including third-party and product liability for private space ventures, are in the works; however, the cost of maximum probable loss (MPL) coverage is a sensitive issue which can handicap the small launch startups planning entry into the suborbital flight market. "Space Activities and Relevant Insurance Implications" online:<<http://space14.paganellirs.com/>>(date accessed: 17 October 2008).

<sup>400</sup> Moysan, *supra* note 213; NASA published a notice of proposed rulemaking on cross waivers in October 2006, supplementing the prior rule in effect since 1991. The changes address the cross waivers among partner states and their contractually or otherwise related entities of the International Space Station, as well as expanding the scope of its missions servicing the station from ELVs (expendable launch vehicles) only to RLVs (reusable launch vehicle) also. President Clinton delegated to the Administrator of NASA the authority to enter into cross waivers with foreign governments and their agents; the proposed rule clarifies this authority to waive claims in exchange for reciprocal waivers or to require the purchase of insurance when a foreign state is not in a position to waive. The text of the promulgated changes reads:



These agreements are incorporated in the launch procurement contracts protecting sub-contractors all along the satellite and launcher contractual chain. While the liabilities within those two chains depend principally upon the national law applicable law to the relevant contract, insurers assume them to be dealt with contractually. The indemnification agreements help manage the cost of insurance. Cross waivers are essentially exclusion of liability clauses, and are so standard in space projects that the United States built them into the first tier of its financial responsibility regime as outlined in the 1988 Commercial Space Launch Act.<sup>401</sup> A great deal of jurisprudence exists surrounding exclusion of liability, and exceeds the scope of this paper.

As noted in Chapter Three, informed consent is also a method used to allocate risk. In addition to the AST requirement that a spaceflight participant give written informed consent, within the United States, some states have also enacted space legislation. Virginia, home to the spaceport at Wallops Island, enacted the Space Flight Liability and Immunity Act in 2007 which allows a space flight entity to avoid liability for a participant injury if the participant gives consent after being properly informed of

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(c)(1) Crosswaiver of liability: Each Party agrees to a cross waiver of liability pursuant to which each Party waives all claims against any of the entities or persons listed in paragraphs (c)(1)(i) through (c)(1)(iv) of this section based on damage arising out of Protected Space Operations. This crosswaiver shall apply only if the person, entity, or property causing the damage is involved in Protected Space Operations and the person, entity, or property damaged is damaged by virtue of its involvement in Protected Space Operations. The cross waiver shall apply to any claims for damage, whatever the legal basis for such claims, against:

(i) Another Party;

(ii) A Partner State other than the United States of America; (iii) A related entity of any entity identified in paragraph (c)(1)(i) or (c)(1)(ii) of this section; or

(iv) The employees of any of the entities identified in paragraphs (c)(1)(i) through (c)(1)(iii) of this section.

14 CFR Part 1266, online:<<http://www.thefederalregister.com/d/p/2008-02-26-E8-2868>>(date accessed: 28 February 2009); online:<<http://www.spaceref.com/news/viewsr.html?pid=22414>>(date accessed 28 February 2009).

<sup>401</sup> Federal Aviation Administration/Office of Commercial Space Transportation “Study of the Liability Risk-Sharing Regime in the United States for Commercial Space Transportation” (1 August 2006) at 2. Sunset provisions now in place will end the risk sharing aspect of the legislation on 31 December 2009 if no extension is passed by Congress. Public Law 108-428 Nov. 30, 2004.

the risks, and which provides the necessary language for a valid and enforceable informed consent.<sup>402</sup> Florida followed suit with its Informed Consent for Spaceflight Act in October 2008,<sup>403</sup> modeling the legislation after Virginia's with one big difference. Virginia's law sunsets in 2013, while Florida's is permanent. Another distinction is that Virginia's law applies to all spaceflight entities but Florida's applies only to suborbital participants. These two states have proactively dealt with the problem of clearly informing participants about the risks by providing precise language.

It is no surprise that informed consent is an issue with regard to human spaceflight, an activity which has been categorized an extreme sport by the National Space Society and others.<sup>404</sup> Long an issue for the medical field, informed consent has become increasingly important for extreme sports aficionados. A distinction between informed consent in the extreme sport context as opposed to the medical arena is that in medicine, the consent is given by the patient to allow something to be done to him or her, while a participant in any extreme activity, including spaceflight, is acknowledging or

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<sup>402</sup> Chapter 893, Chapter 3 Title 8.01, article 24, §§ 8.01-227.9 et seq. The language of the statute is:  
WARNING AND ACKNOWLEDGEMENT: I understand and acknowledge that, under Virginia law, there is no civil liability for bodily injury, including death, emotional injury, or property damage sustained by a participant in space flight activities provided by a space flight entity if such injury or damage results from the risks of the space flight activity. I have given my informed consent to participate in space flight activities after receiving a description of the risks of space flight activities as required by federal law pursuant to 49 U.S.C. § 70105 and 14 C.F.R. § 460.45. The consent that I have given acknowledges that the risks of space flight activities include, but are not limited to, risks of bodily injury, including death, emotional injury, and property damage. I understand and acknowledge that I am participating in space flight activities at my own risk. I have been given the opportunity to consult with an attorney before signing this statement.

§ 8.01-227.10, Virginia Statutes, available online: <https://leg1.state.va.us/cgi-bin/legp504.exe?000+cod+8.01-227.10> date accessed: <28 February 2009>.

<sup>403</sup> "State Support for Commercial Space Activities" Federal Aviation Administration February 2009 available online: <http://www.spaceflorida.gov/docs/StateSupport.pdf> <date accessed: 6 March 2009>.

<sup>404</sup> "NSS Position Paper on Space Tourism" National Space Society, online:<<http://www.nss.org/tourism/position.html>>(date accessed: 17 December 2008).

consenting to the risks inherent in the activity which he or she actually performs.<sup>405</sup>

Either way, competence to make this decision is necessary and the level of information provided to the consenter is crucial.<sup>406</sup> The entry of commercial spaceflight participants into space related activity introduces consumers into what was heretofore either a government or a commercial endeavor, or some combination of those two. The advent of consumer participation in space makes relevant a huge body of contract law, and consumer protection legislation, found in the law of most space-faring states, will enter the picture, particularly as related to exclusions of liability.<sup>407</sup>

While political risk remains a daunting obstacle to commercial space ventures, some progress has been achieved. Washington DC and London signed a treaty intending to ease US ITAR restrictions after ITAR waiver discussions were derailed/aborted.<sup>408</sup> The same preferred status as the United States extended to the United Kingdom was also given to Australia in a similar agreement.<sup>409</sup> Despite the tightening of ITAR enforcement since the late 1990's, Boeing's chairman went on record stating that the company had become more efficient at working the ITAR process.<sup>410</sup> However, it may be possible to

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<sup>405</sup> Knutson, *supra* note 222 at 110. A further distinction in medical informed consent is between procedure-based risks and provider-based risks. Wilton H. Bunch, Victoria M. Dvornch "Informed consent in sports medicine" *Clin Sports Med* 23 (2004) 183 – 193, 183.

<sup>406</sup> The issue of competence to give informed consent is implicated in the current jurisprudence in the United States on the issue of whether a parent can bind a minor's estate by a pre-injury execution of a release. *See Kirton v. Fields*, 2008 WL 5170603 (Fla.) and all the cases cited therein.

<sup>407</sup> For instance, in Quebec it is not possible for a person to exclude or limit his/her liability for bodily or moral injury caused to another. C.C.Q. art. 1474. It would not be possible for a spaceflight participant in Quebec to hold harmless the space flight entity.

<sup>408</sup> *Aviation Week & Space Technology* (25 June 2007) 24; *Aviation Week & Space Technology* (23 June 2007) 35.

<sup>409</sup> "News Breaks: Asia Pacific" *Aviation Week & Space Technology* (10 September 2007) 20; David Bond, ed., "Washington Outlook: Stars in Alignment" *Aviation Week & Space Technology* (10 September 2007) 23.

<sup>410</sup> Howard Chambers, "Trends in the Commercial Satellite Industry" (Keynote speech presented to Euroconsult 2007, Paris France, 5 September 2007) online : [http://www.boeing.com/news/speeches/2007/chambers\\_070905.html](http://www.boeing.com/news/speeches/2007/chambers_070905.html) (date accessed: 11 March 2008); Michael Mecham, « Commercial Payoff : Boeing's satellite mix favors government but leans on private sector technology » *Aviation Week & Space Technology* (9 April 2007) 55 at 57.

mitigate some of the political risk inherent to a deal by the inclusion of provisions in the contracts governing it. We will explore this possibility in the case study in Chapter Five.

Political risk insurance is also available, covering expropriation, currency inconvertibility, non-payment or loss of income because of political violence, contract repudiation or non-honoring of sovereign government payment guarantees, license cancellation, wrongful calling of guarantees, non-delivery by foreign suppliers, and other coverage as negotiated on a case by case basis.<sup>411</sup> Procurement of political risk insurance can be a negotiated term in commercial space launch facility contracts between a private company and a state, with the failure to procure an escape hatch for the company.<sup>412</sup>

### **Sovereign Immunity in Public-Private Partnerships**

P3s are also based upon contractual agreement. In structuring the special purpose vehicle and drafting the joint venture agreements, care in drafting and, possibly, standardization of contracts are tools for keeping arrangements transparent. P3s are most successful when they survive long enough to realize the returns. Six guiding principles have been identified for the sustainability of P3s in infrastructure contexts and they can easily be applied when creating space-related ventures.<sup>413</sup> They are 1) design the project to deliver a balanced risk profile between the public and private partners; 2) win the

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<sup>411</sup> “Political Risks Insurance” Meridian Finance Group, online:<<http://www.meridianfinance.com/>>(date accessed: <3 March 2009).

<sup>412</sup> An example of the language in such a provision is:

Political Risk Insurance. This Agreement is conditional upon Beal being able to obtain Political Risk Insurance, from a source, in a form, and providing coverage that are acceptable to Beal, if Beal applies for such insurance. If Beal does apply for such insurance, Beal shall use its best efforts to obtain such insurance, and Guyana shall fully cooperate with Beal, use its best efforts, and take such further actions as might be necessary to enable Beal to obtain such insurance. If Beal applies for but is unable to obtain political risk insurance, then this Agreement is terminable at Beal's option, which Beal may exercise by delivering written notice thereof to Guyana, and Beal shall have no further obligations hereunder.

Online:<<http://www.sdn.org.gy/guyanaisfirst/agreement.html>>(date accessed 3 March 2009).

<sup>413</sup> Cledan Mandri-Perrott, “Six Guiding Principles to Achieve Sustainable PPP Arrangements”, online: [www.ip3.org <http://www.ip3.org/pub/2005\\_publication\\_002.htm>](http://www.ip3.org/pub/2005_publication_002.htm) (date accessed: 18 April 2008).

commitment of critical stakeholders and operators; 3) develop a strong contract setting forth the rules of the game and clearly defining roles and responsibilities; 4) drive the bidding program allowing buy-in at all levels and stages of the process; 5) demonstrate improved service delivery; and 6) sustain change. Independent advisors have been recognized as useful in structuring P3 transactions to ensure the proper balance between public and private interests.<sup>414</sup> Transparency is a key issue.

Ultimately, the viability of P3s comes down to principles of equity and fair dealing, of fairness and natural justice, or due process, both substantive and procedural. The restrictive theory of immunity was adopted globally in recognition of the practical realities of business and government in the twentieth century, and in an effort to reduce legal maneuvering to avoid responsibility, even by sovereign states. These realities have solidified in the beginning of the twenty-first century. Hence, it is safe to conclude that the restrictive theory of state immunity has achieved the status of customary international law, for it is followed by a majority of the international community.

It is important to address these realities in the early stages of a project. P3s make public services available to more users when done efficiently. The private sector has a better track record. Efficient delivery to more end-users is really an issue of freedom of access, found in Article I of the Outer Space Treaty,<sup>415</sup> and in customary international law— not only to space itself but also to its benefits for all on Spaceship Earth.<sup>416</sup> If both sides of the spectrum proactively acknowledge the exposures and fairly apportion the risks between, then the synergy created by P3s is an awesome resource available to all.

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<sup>414</sup> Jagun, *supra* note 95 at 9.

<sup>415</sup> *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, 27 January 1967, 610 UNTS 205.

<sup>416</sup> Buckminster Fuller, *Operating Manual for Spaceship Earth*, (New York: E.P.Dutton & Co., 1963) section 8.

To summarize, contracts govern almost every aspect of a commercial space project. Awareness of both international and domestic legal obligations facilitates agreements that not only reflect the parties' intentions, but also contracts that are easier to enforce. A great deal of risk can be allocated, also via contractual agreements. Close attention to the language, with clarity and consistency the polestars guiding the drafter, can alleviate many sources of uncertainty.

## **Chapter Five:A case study**

### **The MDA/ATK example**

There's been some hard feelings here  
About some words that were said  
There's been some hard feelings here  
And what is more  
There's been a bloody purple nose  
And some bloody purple clothes  
That were messing up the lobby floor  
It's just apartment house rules  
So all you 'partment fools  
Remember : one man's ceiling  
is another man's floor  
Remember: one man's ceiling  
is another man's floor

Paul Simon

In order to better illustrate the possible utilization of tools available to facilitate a commercial space transaction, it is opportune to describe a deal that failed to come to fruition because of subtle conflicts in law and policy, or stated another way, because of political risk. What makes the example particularly instructive is the fact that the space laws and policies of the two countries involved, Canada and the United States, are largely congruent and the countries are both industrialized and close allies.

In January 2008, Alliant Techsystems Inc. (ATK) announced its intention to acquire a Canadian company, MacDonald Dettwiler and Associates Ltd. (MDA).<sup>417</sup> ATK is a munitions manufacturer, and one of the largest military contractors in the United States.<sup>418</sup> MDA counts among its assets Radarsat-2, the Canadian remote sensing

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<sup>417</sup> “MDA-ATK sale runs into policy obstacles” (18 January 2008) [www.spacepolitics.com](http://www.spacepolitics.com), online:<<http://www.spacepolitics.com/2008/01/18/mda-atk-sale-runs-into-policy-obstacles/>>(date accessed: 3 September 2008).

<sup>418</sup> “ATK Receives Modernize Funding for Lake City Army Ammunition Plant” ASD-Network, online:<[http://www.asd-network.com/press\\_detail/19181/ATK\\_Receives\\_Modernize\\_Funding\\_for\\_Lake\\_City\\_Army\\_Ammunition\\_Plant.htm](http://www.asd-network.com/press_detail/19181/ATK_Receives_Modernize_Funding_for_Lake_City_Army_Ammunition_Plant.htm)>(date accessed: 9 March 2009).

satellite which provides on-orbit views of the Arctic.<sup>419</sup> What makes Radarsat-2 special is the fact that it is space based radar; it can sense images through cloud cover, or under ice.<sup>420</sup>

Several different laws were implicated by the proposed acquisition: the bilateral treaty between the two countries entered into in 2000,<sup>421</sup> the remote sensing laws of both countries,<sup>422</sup> and Canada's Investment Act.<sup>423</sup> In addition, the Master Agreement and Annexes signed by MDA and the Canadian Space Agency in 1998 was a factor as it outlined the relationship between the Canadian company and the civil space agency as related to Radarsat-2.<sup>424</sup>

The bilateral treaty, signed by Canada and the United States in June 2000, was entered into to describe Radarsat-2's mission and solidify Canada's intention to bring its

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<sup>419</sup> "Government Halts ATK/MDA Acquisition" Satnews Daily, online:<[http://www.satnews.com/cgi-bin/display\\_story.cgi?number=1729256759](http://www.satnews.com/cgi-bin/display_story.cgi?number=1729256759)>(date accessed: 16 March 2009).

<sup>420</sup> "Radarsat-2 Successfully Launched" (14 December 2007) online:<[http://www.radarsat2.info/outreach/innews/2007/12142007\\_gsi.asp](http://www.radarsat2.info/outreach/innews/2007/12142007_gsi.asp)>(date accessed: 9 March 2009).

<sup>421</sup> Agreement Between the Government of Canada and the Government of the United States of America Concerning the Operation of Commercial Remote Sensing Satellite Systems, entered into force 16 June 2000.

<sup>422</sup> U.S. Land Remote Sensing Policy Act, Title 15, Chapter 82 (1992); An Act Governing the Operation of Remote Sensing Space Systems, Bill C-25 (20 December 2004)

<sup>423</sup> Public Law 102-555, signed October 28, 1992 (106 Stat. 4163) repeals the Land Remote-Sensing Commercialization Act of 1984 (15 U.S.C. 4201 et seq.).

<sup>424</sup> The author's attempts to obtain the Master Agreement and Annexes from the Canadian Space Agency under Canada's Access to Information Act were thwarted by MDA's refusal of consent. As a third party to the request, MDA's consent was required. However, this is not the first time parties have been denied access to this Agreement and Annexes. Canada's Liberal Government, in place during 2005, refused to permit access to the Annexes to MPs on the House of Commons standing committee on foreign affairs and international trade, despite the fact that the 2000 treaty, the Master Agreement and the Annexes were subsumed by Bill C-25 which the committee was studying at the time. Dan Lett and Paul Samyn "U.S. may have access to Canadian satellite: Grits refuse to let MPs view confidential documents" Liu Institute for Global Issues (8 March 2005) online:<<http://www.ligi.ubc.ca/?p2=/modules/liu/publications/view.jsp&id=1855>>(date accessed: 19 December 2008). Bloggers have been speculating as to the contents of the Annex ever since. Michael Byers "For Sale: Arctic Sovereignty? How losing a Canadian satellite to the US would be like losing our eyes on the North" (June 2008) The Walrus Magazine, online:<<http://www.walrusmagazine.ca/print/2008.06-technology-for-sale-arctic-sovereignty-radarsat-mdamichael-byers/>>(date accessed: 6 March 2009); see also Michael Byers testimony before Parliament re: C-25, *Press for Conversion!* Issue 58 (March 2006) online:<[http://coat.ncf.ca/our\\_magazine/links/58/Articles/12-13.pdf](http://coat.ncf.ca/our_magazine/links/58/Articles/12-13.pdf)>(date accessed: 9 March 2009).



remote sensing laws in line with those of the United States.<sup>425</sup> It recognized both countries' mutual interests in regulating and controlling commercial remote sensing systems in a comparable manner to protect and serve shared national security and foreign policy interests.

Canada followed up with the enactment of Bill C-25,<sup>426</sup> titled the "Remote Sensing Space Systems Act" in November 2005, solidly aligning Canadian legislation with the United States Commercial Remote Sensing Policy of April 2003,<sup>427</sup> and the United States Land Remote Sensing Policy Act of 1991.<sup>428</sup> Both the Canadian and American laws describe the licensing procedure for remote sensing activities and systems. Basically, anyone Canada licenses to operate a remote sensing system is held accountable to the Department of Foreign Affairs and International Trade (DFAIT) for keeping track of who gets the information, and preventing parties from accessing that data without DFAIT's permission. The control is exerted via End User Licensing Agreements or EULAs. Likewise, the US law puts NOAA, the National Oceanographic and Atmospheric Administration,<sup>429</sup> in charge of licensing and control of sensed images, while the Departments of State and Defense are responsible for the protection of national security and foreign policy concerns.

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<sup>425</sup> Agreement Between the Government of Canada and the Government of the United States of America Concerning the Operation of Commercial Remote Sensing Satellite Systems, entered into force 16 June 2000.

<sup>426</sup> This is the same bill that enshrined the 2000 bilateral between Canada and the United States and the off-limits Annexes.

<sup>427</sup> Legislative history of Bill C-25

online:<[www.parl.gc.ca/common/Bills\\_ls.asp?Parl=38&Ses=1&ls=C25](http://www.parl.gc.ca/common/Bills_ls.asp?Parl=38&Ses=1&ls=C25)>(date accessed: 8 March 2009). The 2003 Policy statement clearly directs the United States government to use and rely upon commercial remote sensing sources to the "maximum practical extent."

<sup>428</sup> Public Law 102-555, signed October 28, 1992 (106 Stat. 4163) repeals the Land Remote-Sensing Commercialization Act of 1984 (15 U.S.C. 4201 et seq.).

<sup>429</sup> NOAA is an agency of the Department of Commerce.

The US law contains a broad mandate requiring a licensee to provide un-enhanced data to the government if such provision is “in the interest of the United States...after considering the impact on the licensee and the importance of promoting widespread access to remote sensing data from United States and foreign systems.”<sup>430</sup> The Canadian law phrases the issue of governmental right to data differently, but it essentially means the same thing. “Clause 15 permits the Minister to order a licensee to provide any remote sensing service to the Government of Canada that the Minister believes is desirable for the conduct of international relations for the performance of Canada’s international obligations.”<sup>431</sup> However, the respective governments also control the satellite images through “shutter control,” or the right to halt satellite operations to protect national security.<sup>432</sup> The bilateral between the two states contemplated United States and Canadian cooperation regarding Radarsat-2.

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<sup>430</sup> Title 15 Chapter 82 § 5621(e)(2)(B).

<sup>431</sup> C-25 Clause 15.

<sup>432</sup> Theresa Hitchens “Commercial Imagery: Benefits and Risks” presentation at conference “U.S. Space Operations in the International Context” 24 February 2004 Eisenhower Institute Washington D.C. A discussion about who can exert shutter control and how can be found in Online NewsHour: Satellite Shutter Control – 30 September 1999, Terence Smith, moderator; participants: James Woolsey, former Director of the Central Intelligence Agency, United States; Barbara Cochran, former Washington Bureau Chief of CBS News; and Senator Bob Kerrey, D-Nebraska, then Vice Chairman of the Senate Intelligence Committee, online:<[http://www.pbs.org/newshour/bb/media/july-dec99/shutter\\_9-30.html](http://www.pbs.org/newshour/bb/media/july-dec99/shutter_9-30.html)>(date accessed: 1 December 2008). Shutter control is not the only method a state can utilize to exert control over sensed data. A state can also purchase all the images made available by selective data acquisition and programmable data acquisition, thus removing them from the market and blocking access. This would actually be more in keeping with the United States’ stated policy of supporting commercialization of remote sensing. In fact, the United States has done just that.

The Pentagon’s National Imagery and Mapping Agency (NIMA) signed a contract with Space Imaging, a US firm, giving the Department of Defense control of all commercially available, high resolution images of Afghanistan taken by the Ikonos satellite for a mere \$2M USD a month. David Corn *Their Spy in the Sky* The Nation (26 November 2001) online:<<http://www.thenation.com/doc/20011126/corn>>(date accessed: 1 December 2008). Although on the face of it, the result of shutter control (halting the imaging) appears the same as the result of NIMA’s deal (government takeover of all sensed images by a specific satellite over a designated area, a form of censorship), they differ. The second scenario allows the images to be sensed; the government simply controls the satellite and can do what it wishes with its purchased product.

The Investment Canada Act recognizes that influx of capital and technology are of benefit to Canada, states its purpose as encouragement of investment by non-Canadians, and requires the review of significant investments in Canada by non-Canadians “in order to ensure such benefit.”<sup>433</sup> The responsibilities to administer the Act and to notify and review as per the Act fall to the Minister of Industry. The Act also sets limits for which investments meet the dollar threshold for review and excepts from those requirements an investment in a type of business that is related to Canada’s cultural heritage or national identity, meaning that those investments are always reviewable, no matter the size of the investment. The Act contains a list of factors to be considered in determining whether the foreign investment is of net benefit to Canada.

For all that both countries sought harmonization of their laws, the ATK acquisition of MDA did not come to fruition.<sup>434</sup> We can only surmise all of the reasons why. However, the first volleys were leveled almost immediately and ranged from distaste for ATK’s armaments divisions, in particular its manufacture of landmines which would violate Canada’s anti-landmine treaty, to dismay that the deal would direct back to the US contracts and money that could have benefited Canada’s economy in general and space program in particular.<sup>435</sup> Part of the uproar very probably resulted from the financial structure of the public-private partnership behind Radarsat-2, chief among

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<sup>433</sup> R.S.C. 1985, c. 28 (1st Supp.)

<sup>434</sup> “Ottawa Says No To ATK Buyout of MDA” (10 April 2008) online:<[http://www.nasawatch.com/archives/2008/04/ottawa\\_says\\_no.html](http://www.nasawatch.com/archives/2008/04/ottawa_says_no.html)>(date accessed: 15 March 2009).

<sup>435</sup> “Policy obstacles” *supra* note 409; “Media Advisory – CAW and Rideau Institute seek release of information by Industry Minister Jim Prentice on MDA deal with ATK” [www.tradingmarkets.com](http://www.tradingmarkets.com) (30 March 2008) online:<<http://www.tradingmarkets.com/.site/news/Stock%20News/1274621/>>(date accessed: 28 November 2008).

MDA's assets.<sup>436</sup> The Canadian government, through the Canadian Space Agency, provided 83% of Radarsat-2's \$525M (\$436M) cost to develop and build, while MDA contributed the balance (\$91M), essentially making the satellite a Canadian asset.<sup>437</sup>

Also of concern was Radarsat-2's stated mission, to patrol the "High North." Canada first claimed the Northwest Passage, located in the Arctic, as part of its sovereign territory in 1973. Once iced over, global warming has melted large amounts of ice, opening waterways and revealing resources such as untapped fish stocks. Oil and gas are as-yet undiscovered but are believed to exist below the ice.<sup>438</sup> The more easily navigated waterway reduces the sea journey between Europe and Asia by almost 2,500 miles.<sup>439</sup> The United States has asserted its position that the waters are a strait for international navigation and, therefore, neutral and not subject to Canadian sovereignty. Russia, Norway, Great Britain, China, Denmark and the EU are also preparing claims to the region which is becoming increasingly more strategic in light of international tension currently unfolding.<sup>440</sup> Canada has plans underway to build a new military installation and a winter fighting school in the area.<sup>441</sup>

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<sup>436</sup> Another high profile and important MDA asset is the Canadarm, the robotic arm aboard the International Space Station which has been an outstanding success and put Canada in the forefront with regard to robotics.

<sup>437</sup> Richard Sanders "The Growing Costs of Radarsat-1 and 2" Press for Conversion! (March 2006) Issue 58 online:<<http://activistmagazine.com/index.php?option=content&task=view&id=796&Itemid=143>>(date accessed: 9 March 2009).

<sup>438</sup> A U.S. geological survey estimates the Arctic seabed holds 25 % of the world's undiscovered oil and gas. "Canada plans Arctic military base" Aljazeera.net (11 August 2007) online:<<http://english.aljazeera.net/news/americas/2007/08/2008525121039426686.html>>(date accessed: 9 March 2009).

<sup>439</sup> Rupert Cornwell "Canada issues warning to US over Arctic passage" The Independent, online:<<http://www.independent.co.uk/news/world/americas/canada-issues-warning-to-us-over-arctic-passage-524860.html>>(date accessed: 5 March 2009).

<sup>440</sup> Bronwen Maddox "Russia leads Arctic race to claim Northwest Passage" Times Online from The Times, online:<[http://www.timesonline.co.uk/tol/comment/columnists/bronwen\\_maddox/article5671438.ece](http://www.timesonline.co.uk/tol/comment/columnists/bronwen_maddox/article5671438.ece)>(date accessed: 9 March 2009). Of particular note, Russia planted its flag on the sea bed at the North Pole in 2007, an action which inflamed the international community but which is considered more symbolic than

By April 2008, the proposed transaction reached an impasse. Citing the Investment Canada Act and its mandate that non-Canadian investment satisfy the net benefit test, the Industry Minister expressed his dissatisfaction with the deal in a letter to ATK.<sup>442</sup> Even if the net benefit requirement was met, the sale would still have to obtain the approval of the foreign affairs minister as per the Remote Sensing Space Systems Act. That law allows DFAIT to approve, issue, amend or renew a license when national security, defense, or international relations or obligations are implicated.

All of which brings us back to Radarsat-2's polar patrol of the hotly contested Northwest Passage and the ramifications of acceding control of the satellite to the US if the deal was to have gone through. As a Canadian spacecraft, Radarsat-2 is subject to Canada's jurisdiction and control as per the space treaties. In order to acquire MDA, ATK, a US company, was required to obtain a license from the Department of Commerce, with which the US could then impose shutter control.<sup>443</sup> Furthermore, as a US owned company, MDA would be subject to US ITARs and Canada would require US approval to do anything with what is essentially a Canadian space object performing an important function for Canadian sovereignty. To further complicate the matter, Canada and the US are diametrically opposed in their positions concerning the Northwest Passage. It is not difficult to imagine situations where the US could cause Canada problems with Radarsat-2. Canada would not have its priority access to observed images

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anything. "Russia plants flag under N Pole" BBC News (2 August 2007) available online: <http://news.bbc.co.uk/2/hi/europe/6927395.stm> <date accessed: 9 March 2009>.

<sup>441</sup> "Canada plans Arctic military base", *supra* note 442.

<sup>442</sup> Tonda Maccharles "Ottawa puts brakes on sale of space firm" thestar.com (10 April 2008) online:<<http://www.thestar.com/News/article/413281>>(date accessed 3 September 2008).

<sup>443</sup> It is very likely that the mysterious Annexes contain some treatment of the shutter control issue as the bilateral deals with Radarsat-2 and the US and Canada. Radarsat-1 has also been very helpful to the US, helping the military with map making.

if the US pulled Radarsat-2 off task for its own national interest. Worse, the images could be used to hurt Canada in its claim for sovereignty of the passage.

Ultimately, ATK was not able to purchase MDA. However, it is possible that the dilemma could have been resolved, and the deal saved, another way – through careful contracting and allocation of risk, as described in Chapter Four.

ATK is a US company. As a result, US shutter control became implicated in operation of Radarsat-2. Allocating the risk of that event to ATK could perhaps have satisfied the Canadian government. For instance, perhaps a provision in the contract's assignment clause could have addressed the issue.<sup>444</sup> Assignment clauses typically describe the parties' ability or inability to transfer their rights under the contract. The assignment clause in this case could have been triggered by US interference and said something along the lines of "should at any point in time the US interfere with the operation of Radarsat-2 and its timely provision of images to the Canadian government, ownership of MDA will automatically revert back to Canada or Canadian principals." In this way, the risk would be borne by the party in the best position to manage it, ATK. Furthermore, this is a fair solution. US interference only became implicated because ATK is a US company.

This may be a simplistic proposal. The US, also on board because of its national regulatory, licensing, and export regimes, might have expressed the same dismay that Canada did when confronted with the possible sale, if such a clause had been included. The bottom line is that political risk killed the deal. Perhaps political risk insurance could have created some predictability, by ensuring that ATK would be reimbursed should the

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<sup>444</sup> We can only surmise that there was in fact an assignment clause, but assuming that there was and that its language was somewhat standard, this would be the correct place to place a condition triggered by US interference in operation of a Canadian satellite monitoring Canadian territory.

triggering event occur and ownership revert back to Canadian principals. For all we know, these proposed solutions may have been contemplated by the parties or even negotiated between them. Certainly, the parties, MDA and ATK, both had reason to try to work with the two governments in an effort to assuage security concerns. It is possible that including the powers that be in the negotiation process may have been useful in coming to terms acceptable to the approving authorities.

The final word on the transaction fell to the Canadian Ministry of Industry. In light of the state's ultimate responsibility for the space activities of its nationals, this is a predictable outcome.

## **Chapter Six**

### **Recommendations**

God grant me the serenity  
to accept the things I cannot change;  
courage to change the things I can;  
and wisdom to know the difference.

The Serenity Prayer, Reinhold Niebuhr

Occam's Razor states that when you have two competing theories that make exactly the same predictions, the simpler one is better.<sup>445</sup> On the one hand, space law is public law and certainty will derive from the treaties. On the other, private international law applies to space and will provide predictability. Here, the simpler theory is the one that includes both of these. While a great deal of the uncertainty in a space transaction can be handled with the tools available to the entire international commercial community, some of it cannot.

Contracts figure in space business in a multitude of ways. There are purchase contracts, end user licensing agreements, servicing agreements, lease agreements, technology transfer agreements, insurance contracts, and joint venture agreements. These name only some of the long list of agreements related to space. As in all contractual situations, careful drafting, simplicity, transparency, and consistency are of utmost importance. The parties to a transaction have a vested interest in seeing the project not only come to fruition, but also achieve its goals with maximum predictability and minimum dispute. For that reason, it is to the parties' advantage to be transparent with each other, and with the states that will assume ultimate responsibility for a space venture.

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<sup>445</sup> Phil Gibbs (1996), updated by Sugiihara Hiroshi "What is Occam's Razor" (1997)  
online:<<http://math.ucr.edu/home/baez/physics/General/occam.html>>(date accessed: 10 February 2009).



Ultimately, there are no entirely private space transactions. And for this reason, political risk remains the most troublesome risk of all in commercial space. Ironically, the public and private sectors have more incentive now than ever before to work together, either through partnerships, or through cooperative regulation and compliance. Engaging the regulatory authorities from inception of a project, and tailoring the agreements that govern it in accordance with that dialog, might help break the disconnect between the private side's desire to further develop space and the public side's mandate to mitigate state liability, and govern responsibly.

As long as states operate within a zero-sum game construct,<sup>446</sup> national paranoia will work at odds with the mandates of the Outer Space Treaty and will continue to undermine freedom of access and the benefits that are available to all of mankind. No matter how willing the private parties involved, or how much the agreement between public and private partners, the states have the last word.

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<sup>446</sup> "In zero-sum games, the fortunes of the players are inversely related....one contestant's gain is the other's loss." Robert Wright *NonZero: The Logic of Human Destiny* (Vintage Books: Random House New York (1<sup>st</sup> ed. 2001) at 5.

## **GLOSSARY of ACRONYMS**

AIA	Aerospace Industries Association
AST	Office of Commercial Space Transportation
ATK	Alliant Techsystems Inc.
BA	Bigelow Aerospace
CNS/ATM	Communications, Navigation and Surveillance Systems for Air Traffic Management
COMSATCOM	Commercial satellite communications
COPUOS	Committee for the Peaceful Uses of Outer Space
COTS	Commercial Orbital Transportation Services
CSIRO	Commonwealth Scientific and Industrial Research Organization
CSLA	US Commercial Space Launch Act
DFAIT	Department of Foreign Affairs and Int'l Trade
DISA	US Defense Information Systems Agency
DOD	Department of Defense
ERSDAC	Earth Remote Sensing Data Analysis Center
ESA	European Space Agency
EU	European Union
EULA	End user licensing agreement
FAA	Federal Aviation Administration
FSA	UK Financial Services Authority

FSIA	Foreign States Immunity Act
GEO	Geostationary earth orbit
GPS	Global Positioning System
HDTV	High definition television
IATA	International Air Transport Association
ISRO	Indian Space Research Organization
ISS	International Space Station
ICAO	International Civil Aviation Organization
ICC	International Chamber of Commerce, Paris France
IGO	Intergovernmental Organizations
IOIA	International Organizations Immunities Act
ITAR	International Traffic in Arms Regulations
ITU	International Telecommunications Union
JAXA	Japan Aerospace Exploration Agency
JV	Joint venture
LEO	Low Earth Orbit
MDA	McDonald, Dettwiler and Associates Ltd.
MPL	Maximum Probable Loss
NASA	US National Aeronautics and Space Administration
NGSO	Non-geosynchronous orbit
NOAA	US Nat'l Oceanic and Atmospheric Administration
NSS	National Space Society
OST	Outer Space Treaty

P3s	Public private partnership
PDA	Personal digital assistant
RFI	Request for Information
SEC	US Securities and Exchange Commission
SLV	Satellite launch vehicles
SPV	Special purpose vehicle
TCA	Transformational Communications Architecture
UCC	Uniform Commercial Code
UNCLOS	UN Convention on the Law of the Sea
UK	United Kingdom
UNCITRAL	UN Commission on International Trade Law
US	United States
VoIP	Voice over Internet Protocol
WTO	World Trade Organization

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