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FOREWORD

By Joanne Irene Gabrynowicz[*]

Space activities are made possible by large objects: rockets, satellites, space stations, launch facilities. They are also conducted by larger than life actors: Nation-States, major aerospace corporations, confident entrepreneurs, and risk-takers. This volume of the JOURNAL OF SPACE LAW contains two articles that demonstrate that, in space law, small things are also important.

In their article, *Small Satellites and Small States: New Incentives for National Space Legislation,* Prof. Irmgard Marboe and Senior Research Assistant Karin Traunmüller chronicle how low-cost satellite missions that include the development, launch, and operation of mini satellites, micro satellites, nano satellites, pico satellites, and femto satellites do more than create new opportunities for nations and industries that were previously limited to using the capabilities of major space-farers. They have also catalyzed a number of important legal issues that are prompting the Nation-States in which these satellites are being developed to consider whether or not their existing national legal frameworks are sufficient to both promote the positive effects of small satellites while appropriately addressing their associated risks.

In his article, *Comparison of Selected Space Law Terms of Art Used in Chinese and English Versions of the U.N. Space Treaties,* Dr. Guoyu Wang addresses the small—but significant—differences that can occur in legal terms of art in the translation process. The subject of Dr. Wang's paper was conceived when the JOURNAL OF SPACE LAW'S Editor-in-Chief heard

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[*] Joanne Irene Gabrynowicz is the Editor-in-Chief of the JOURNAL OF SPACE LAW. She is also a professor of space law and remote sensing law and the Director of the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi School of Law. Prof. Gabrynowicz was the recipient of the 2001 Women in Aerospace Outstanding International Award and the 2011 International Institute of Space Law's Distinguished Service Award. She is a Director of the International Institute of Space Law and a member of the American Bar Association Forum on Air and Space Law.

Chinese conference participants and saw official Chinese English language publications refer to space as the "common wealth of mankind." Although the speakers and publications indicated that they were discussing either the "province of all mankind" principle contained in the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies[1] or the "common heritage of mankind" principle contained in the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies,[2] the term "common wealth of mankind" is used in neither instrument.

When Dr. Wang visited the National Center for Remote Sensing, Air, and Space Law at the University of Mississippi School of Law as a visiting scholar, the Editor-in-Chief told him about the "common wealth of mankind" references and asked him to compare the official English and Chinese translations of the Outer Space Treaty and the Moon Agreement. After numerous conversations it was decided that research was in order to determine the status of the term "common wealth of mankind." Investigating these, and other terms of art, led to this article. It is worth noting that the article is not an attempt to further interpret the treaty terms. It is, however, an attempt to show some of the syntactic structures and cultural elements that are part of language itself and which can give rise to misconceptions between Chinese and Western space law professionals.

This volume's third major article, *The GPS-Galileo Agreement and Treaty Law,* also addresses the inherent difficulties in interpreting language. However, its author Mr. Michael Dodge returns the reader to the larger elements of space activities and space law. Mr. Dodge examines the nascent, but increasingly growing subject of the law of global navigation systems (GNSS). Commerce, transportation, shipping, and many other activities

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[1] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies, art. 1, *opened for signature* Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty].

[2] Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, art. 11, *opened for signature* Dec. 18, 1979, 1363 U.N.T.S. 21 [hereinafter Moon Agreement].

around the world rely daily on the navigation capabilities that these systems provide. Mr. Dodge surveys a wide array of official statements and agreements regarding current GNSS law and policy, with a particular focus on those between the United States and European Union. He uses the *GPS-Galileo* Agreement as a specific example. Mr. Dodge concludes that Parties can clarify ambiguities before problems arise and expresses hope for future discussions.

The volume's offerings are rounded out with a review of Michael Chatzipanagiotis' new book, *The Legal Status of Space Tourists in the Framework of Commercial Suborbital Flights* by Diane Howard and a bibliography. As always, the bibliography contains the most recent developments in laws, regulations, cases, administrative decisions, articles, books and reports in aviation and space law.

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The National Center for Remote Sensing, Air, and Space Law of the University of Mississippi School of Law is delighted to announce that it will publish Volume 39, issue 2 of the JOURNAL OF SPACE LAW in the second half of 2013.

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To be considered for the next issue, submissions should be received on or before September 13, 2013. However, the JOURNAL OF SPACE LAW will continue to accept and review submissions on an ongoing basis.

THE *GPS-GALILEO* AGREEMENT AND TREATY LAW

Michael Dodge[*]

I. THE *GPS-GALILEO* AGREEMENT

The law of global navigation satellite systems (GNSS) is a nascent, yet growing academic field. The subject matter it studies, GNSS, has been and is becoming ever-more important in the modern world, both for transportation and for commerce. Indeed, globalization has seen billions of euros in trade associated with both nautical and aviation shipping, and this trend is likely to grow larger with the passage of time. Additionally, the nations of the world are fast realizing the potential of GNSS to make their aviation industries more robust and efficient, with integration of GNSS into air traffic management certain to increase the number of aircraft in flight at any given time, decrease the separation between such craft, and allow for safer takeoffs and landings, as well as improve flight in areas whose terrain has traditionally been quite challenging for contemporary navigational aids. In 2004, the United States and the European Community signed an agreement intended to ensure radio-compatibility and interoperability between the U.S. *Global Positioning System* (*GPS*) and the upcoming *Galileo* GNSS. This collaboration should enable continued and rapid growth of commerce and navigation improvements to aviation, but several of its provisions are poorly, if at all, defined. Accordingly, this article attempts to elaborate the nature and meaning behind the 2004 Agreement, while also serving to illuminate current legal theories concerning the liability regimes that accompany GNSS.

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[*] Michael Dodge obtained his J.D. from the University of Mississippi School of Law in 2008, and after a short tenure working on legal archival papers from early space law attorney Andrew G. Haley, he went to McGill University Faculty of Law, in Montreal, Canada, to obtain his LL.M. in Aviation and Space Law (2012). His interests primarily include GNSS law, the conceptions of sovereignty as applied to space, and the intersection of aviation law with that of outer space.

The first section of this article focuses on recent international agreements between the United States and the European Union concerning the integration of signals and systems for GNSS, specifically the creation of a new European GNSS system known as *Galileo* and its future companionship with the U.S. *GPS*. The first, and most germane, agreement is known as the Agreement on the Promotion, Provision and use of Galileo and GPS Satellite-based Navigation Systems and Related Applications.[1] The second agreement was a joint-statement, made in 2008 and intending to reaffirm the commitments each Party had made towards *GPS-Galileo* compatibility.[2] A second joint-statement was released in 2010, again reaffirming each Party's commitments, as well as recognizing the exceptional benefits that would accrue to aviation navigation from the use of a compatible *GPS-Galileo* network.[3]

After a discussion of the *GPS-Galileo* Agreement, this article delves into the nature of international agreements, and attempts to discern whether the 2004 Agreement in particular constitutes an international treaty or something weaker. The analysis proceeds to ask what constitutes a treaty from an international law perspective, and how this differs from the conception of treaty making in the United States. This section also asks what other types of international agreements exist and how these apply to the U.S. and E.U. Finally, this discussion is made all the more relevant by the problems associated with vague and ill- or non-defined language in the Agreement, as well as how such language might properly be interpreted and resolved under an international law matrix.

Ultimately, then, a case study in current GNSS law is necessitated, for the resolution of problems generated by potential

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[1] Agreement on the Promotion, Provision and use of Galileo and GPS Satellite-based Navigation Systems and related Applications, U.S.-E.C., 26 June 2004 [hereinafter Agreement].

[2] Joint-Statement by Representatives of the United States, the European Community and its Member States on GPS and Galileo Cooperation, Oct. 24, 2008, GPS.GOV, http://www.gps.gov/policy/cooperation/europe/2008/joint-statement/.

[3] U.S. Department of State Media Note, United States and European Union Announce Collaboration on the Use of Global Navigation Satellite Systems, U.S. DEPT. OF STATE, http://www.state.gov/r/pa/prs/ps/2010/07/145465.htm (last visited Sept. 18, 2012).

disagreements between the two primary parties of the Agreement is a testament to current understanding of international law, as well as navigation through the serpiginous waters of geo-political realities.

Finally, analysis of the liability regime surrounding the use of *GPS* and, eventually, joint use of *GPS* and *Galileo* is warranted. Certain of the Agreement's language addresses liability, but some case law and policy has already been developed, especially in the United States, as to how GNSS liability may be apportioned. A summation of the current liability law is sampled, and it is hoped this article can begin to integrate any changes brought about by the Agreement into the current liability regime. While the primary focus of this article is not an analysis of liability for GNSS systems,[4] no treatment of this technology would be complete without at least a cursory review.

Both the United States and the European Union have a plethora of designs on the use of positioning, navigation, and timing (PNT), both now and in the coming years. To that end, these entities have come together to draft a solution to their oft-times shared vision of the future. Though each party has its own practical and ulterior motives for concluding an agreement with the other, their joint cooperation is certain to have a lasting effect on GNSS for the next several decades.

A. Origins and Purposes

Arising out of Europe's growing dependence on GNSS technology, the *Galileo* PNT program sets Europe on the path to navigational certitude. Indeed, Europe has stressed that the *Galileo* program was conceived and initiated generally to ensure European independence from the existing GNSS systems available—primarily *GPS* and *GLONASS*. Europe claims that "Galileo will ensure Europe's independence in a sector that has be-

[4] For such a thesis, *see* Pablo Rodriguez-Contreras Pérez, GNSS Liability Issues: Possible Solutions to a Global System (2002) (unpublished LL.M. Thesis, McGill University Institute of Air and Space Law, 2002) (on file with Nahum Gelber Law Library, McGill University).

come critical for its economy and the well-being of its citizens."[5] The fear of possibly losing access to the aforementioned systems currently available free of direct user fees is a potent motivator for creating a Europe-centric GNSS. The European Commission also notes the desirability of having a European navigational system that allows for business, scientific, and employment opportunities, and that, should the systems on which Europe currently relies be switched off, those same fields would suffer as a consequence.[6] The economic boon predicted to come of the *Galileo* enterprise should not be forgotten: the European Commission boldly claims that all-told, *Galileo* should result in €90 billion within the first twenty years alone.[7] Finally, the fact that the system was supposed to be fully civil, and not military, based, likely curried favor with business and scientific interests desirous of the stability that accompanies the knowledge that systems will not be compromised for ongoing military operations.

Having thus established the motivation for *Galileo*, the road to its creation certainly has not been easy. The European Commission presented the plan for development in 1999,[8] and the European Community signalled its intention to participate that same year with the Council Resolution of 19 July 1999.[9] The program was intended to attract private investors, though this expectation has produced underwhelming results. A decision was made to continue *Galileo* with public funding, though this has not failed to garner the requisite political attention.[10]

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[5] *Satellite Navigation, Why Galileo?*, EUROPEAN COMMISSION, ENTERPRISE AND INDUSTRY, http://ec.europa.eu/enterprise/policies/satnav/galileo/why/index_en.htm (last visited Sept. 13, 2012).

[6] *Id.*

[7] *Id.*

[8] EC Commission, *White Paper on European Transport Policy for 2010: Time to Decide*, COM(2001)370, [2001] at 101.

[9] EC, *Council Resolution of 19 July 1999 on the Involvement of Europe in a New Generation of Satellite Navigation Services-Galileo-Definition Phase*, [1999] OJ C 221 3.8.1999/1.

[10] *Galileo's New PPP: Public-Public Partnership*?, INSIDE GNSS (July/August 2007) http://www.insidegnss.com/node/255. "The abandonment of the public-private partnership (PPP) approach, first embraced nearly nine years ago, has opened the Galileo program to a new round of political maneuvering with even more players and perspectives to reconcile than when the program was approved." *Id.*

Ultimately, though, the program marches inexorably onward, eking out existence despite economic and political hurdles placed in its path.

Once it became clear that Europe wished to create its own system, however, international concern grew on the part of the United States, which opposed *Galileo* as a duplication and competitor for the *GPS*.[11] Notwithstanding this concern, Europe pressed forward with its GNSS plans, leaving the United States to modify its position. In the end, the two powers decided the best solution rested in joining the two systems together, and reaping the benefits of both simultaneously whilst mollifying U.S. concerns. This was the genesis of the Agreement on the Promotion, Provision and Use of Galileo and GPS Satellite-Based Navigation Systems and Related Applications.

Before analysing specific features of the Agreement, it is interesting to note that it was originally signed by the United States on the one hand, and the European Community on the other. Since the success of the Treaty of Lisbon, the European Community political entity has transmuted into the European Union. The question as to whether the Agreement still applies to the EU, then, while valid, is readily dismissed. The U.S. Department of State stated:

> In a Verbal Note dated November 27, 2009, that was transmitted to the Government of the United States of America, the Council of the European Union and the Commission of the European Communities stated in part: 'The Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community will enter into force on 1 December 2009. …[A]s from that date all agreements between your country and the European Community/European Union, and all commitments made by the European Community/European Union to your country and made by your coun-

[11] Delphine Jaugey, The Use of Global Navigation Satellite Systems (GNSS) for Air Navigation Purposes: Benefits, Vulnerabilities of the Systems and Legal Issues (unpublished LL.M. Thesis, McGill University Institute of Air and Space Law, 2006) at 41.

> try to the European Community/European Union, will be assumed by the European Union.'[12]

Moreover, amendments to the Treaty of Lisbon noted that "the Union shall replace and succeed the European Community."[13] The change from Community to Union prescribes no quizzical legal problems. Indeed, though "state succession is an area of great uncertainty and controversy . . . partly to the fact that much of the state practice is equivocal . . . ,"[14] little controversy should erupt upon proclaiming "that which we call a rose, by any other name would smell as sweet."[15] In essence, there was not so much a change in sovereign as a change in moniker.

B. Key Provisions

The Agreement contains a number of provisions which define its mandate and shape its use in the international arena. Concepts such as cooperation among States, search and rescue policy, interoperability of services, military applications, derivative services, and liability all receive due treatment under the Agreement's articles. Other facets of the Agreement include the preamble, common to international accords and replete with diplomatic language facilitating the forthcoming articles, a definitions section listing the myriad technical and legal concerns addressed below, and an annex detailing *GPS* and *Galileo* signal structures.

Article 1 sets forth objectives, focusing on the peaceful use of civil *GPS* and *Galileo* signals, services, and applications. The Agreement is meant not only to compliment agreements in force between the United States and the European Community concerning civil GNSS, but also to facilitate the creation of future agreements. Such agreements could also concern the design of

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[12] EC to EU, U.S. Dept. of State, State Department, at 86, http://www.state.gov/documents/organization/143863.pdf.

[13] *Amendments to the Treaty on European Union and to the Treaty Establishing the European Community*, Dec. 17 2007, Official Journal of the European Union, C 306/10, 17/12/2007.

[14] IAN BROWNLIE, PRINCIPLES OF PUBLIC INTERNATIONAL LAW 650 (7th ed., Oxford: Oxford University Press, 2008).

[15] WILLIAM SHAKESPEARE, ROMEO AND JULIET act 2, sc. 2.

future GNSS, as well as the services and augmentations thereof.

The insistence on the peaceful use of GNSS signals between *GPS* and *Galileo* is in keeping with the principles of other extant space laws. Article III of the Outer Space Treaty implores States to "carry on activities in the exploration and use of outer space . . . in accordance with international law. . . in the interest of maintaining international peace." Such cooperation is also promoted by the International Civil Aviation Organization's (ICAO) Charter on the Rights and Obligations of States Relating to GNSS Services, which notes, among other provisions, that "with a view to facilitating global planning and implementation of GNSS, States shall be guided by the principle of co-operation and mutual assistance whether on a bilateral or multilateral basis"[16]—a feature echoed by the "framework of cooperation" established by Article 1 of the Agreement.

Value-added services, those services that use civil GNSS signals in such a way as to "provide additional utility"[17] to the end-user, are of major concern in the Agreement. Such services might include anything from shipping or aviation mapping services to a bank or laboratory's timing software. The economic and scientific benefits of GNSS to business entities and scientific endeavors are manifest, and the obvious utility of GNSS signals to such derivative applications no doubt drove the drafters of the Agreement to quickly conclude they ought to be protected by future intercourse between Parties. Article 5 of the Agreement goes so far as to mandate the Parties consult with one another before establishing new rules, regulations, or procedures regarding the use of value-added services (along with augmentations, navigation and timing equipment, et al. affected by the use of GNSS signals).

A particularly interesting feature of the Agreement is its prioritization of a search and rescue service signal. Article 12 notes that both *Galileo* and future generations of *GPS* satellites will have a search and rescue service, and that the signal used

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[16] *Charter on the Rights and Obligations of States Relating to GNSS Services* [hereinafter *GNSS Charter*], ICAO Assembly Resolution A32-19, at art. 7.

[17] Agreement, *supra* note 1, at art. 2(q).

for such services should be radiofrequency compatible, as well as interoperable at the user level.[18] Cooperation on rescue services is established, albeit such deliberations are not pigeonholed into one or another particular international forum. This forward-thinking article also evidences that the Parties were concerned with more than commercial, scientific, and military usages during the drafting phase.

While intending to reinforce the exclusively civil nature of the upcoming *Galileo* system, the Agreement was nevertheless aware of the national security and military usages of GNSS. To that end, the Parties undertook to prevent the hostile use of GNSS signals while continuing to provide service outside of areas of conflict, endeavouring in the meantime to comply with the National Security Compatibility Compliance criteria found in the Annex.[19] The Parties also agreed to continue studying national security issues in a working group setting.[20] This article demonstrated the commitment of each Party to cooperation in the provision of civil signals, while carefully skirting around the intrinsically militaristic origin (and continued military use) of *GPS*.

Responsibility and liability are handled via Article 19, the crux of which states that the Parties have responsibility for failure to comply with the Agreement's obligations. To provide for confusing situations in which it is unclear whether an obligation belongs to the European Community as a whole, or to one of its member States, the United States would be entitled to request clarifying information and, if this information is not forthcoming, then the European Community and their several member States would be jointly and severally liable for the resultant damage.

Finally, the key provisions in the Agreement, and those that most ably demonstrate its purpose in being, are those concerning radiofrequency compatibility and interoperability at the

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[18] This may eventually prove useful as a tool to be utilized in conjunction with the International Charter on Space and Major Disasters, *available at* http://www.disasterscharter.org/home (last visited Nov. 28, 2012).

[19] Agreement, *supra* note 1, at art. 11(2).

[20] *Id.* at art. 11(8).

user level. This, of course, is the primary consolation to the United States for co-existing with a new civil system out of Europe. Instead of bracing against a new competitor, it could welcome a *de facto* expansion in its own current constellation, minus military applications. Article 4(2) notes that "GPS and Galileo shall be radiofrequency compatible." Article 4(3) continues that to the greatest extent possible, *GPS* and *Galileo* shall be "interoperable at the non-military user level." The Parties are to go so far as to "realize their coordinate reference frames as closely as possible to the International Reference Terrestrial System," and to transmit the time offsets between the systems. They also agreed to establish a working group to study these matters.[21] In efforts to maintain radiofrequency compatibility and service interoperability, the Parties are further bound to comply with standards set by international bodies such as ICAO and the ITU.[22] Finally, Article 11(1) notes that the Parties shall work together to "ensure radio frequency compatibility in spectrum use between each other's signals." Furthermore, these provisions seem to comply with the GNSS Charter's Article 5, which notes that "States shall co-operate to secure the highest practicable degree of uniformity in the provision and operation of GNSS services."

This focus on interoperability and compatibility ensures end-users and government providers alike of greater GNSS fidelity and usability in the future. "GNSS is inherently fragile,"[23] but together the systems will strengthen reliance on PNT in commerce, scientific pursuits, and general civil convenience. Indeed, though the systems will remain separate, and though *GPS* will continue to be a military asset that provides a civil benefit, the compatibility of the civil aspect of *GPS* and totality

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[21] *Id.* at art. 4(4).

[22] *Id.* at art. 4(5); *see also, e.g.,* ICAO Annex 10, 2.4.3.1 (establishing "Recommendation.— A State that approves GNSS-based operations should ensure that GNSS data relevant to those operations are recorded. Note 1.— These recorded data are primarily intended for use in accident and incident investigations. They may also support periodic confirmation that accuracy, integrity, continuity and availability are maintained within the limits required
for the operations approved.")

[23] FRANCIS LYALL & PAUL B. LARSEN, SPACE LAW: A TREATISE 401 (Farnham: Ashgate Publishing Limited, 2009).

of *Galileo* will essentially double the power of either system, providing a much-warranted salve of redundancy to critical Earth-bound infrastructure, commercial, scientific, and individualistic interests. Should several satellites in *GPS* fail all at once—perhaps due to collisions with orbital debris—then *Galileo* could compensate and vice versa. Concern over the possibility of selective availability or military degradation of *GPS* signals in conflict areas would be of far less concern to interests capable of relying on the civil Galileo, and yet in the vast majority of cases in which this concern would never even arise, these same users would have a truly *global* navigation satellite system on which they could faithfully depend.

C. Related Agreements and Statements

Before delving too far down the proverbial rabbit's-hole in analyzing the Agreement, it behooves the inquisitive mind to know that many other navigation agreements and statements have been made between the U.S. and other States.[24] Several of these have been between the U.S. and Europe, though none quite so critical as the Agreement itself. Of note:

- 2006 Joint Statement on Galileo and GPS Signal Optimization by the European Commission (EC) and the United States (US).[25] This Statement revealed the efforts of 21 months by the Parties to address concerns over signal structure optimization meant to ensure better performance. A jointly-optimized common signal was produced by the working committee on frequency compatibility and interoperability, and the Statement notes the Parties would then assess the implementation this signal, which is to be broadcast by up to 60 satellites (the eventual combined might of *GPS* and *Galileo*).

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[24] For a listing of such agreements and State partners, *see International Cooperation*, GPS.gov, *available at* http://www.gps.gov/policy/cooperation/(last visited Nov. 28, 2012).

[25] *Joint Statement on Galileo and GPS Signal Optimization by the European Commission (EC) and the United States (US)*, *available at* http://www.losangeles.af.mil/shared/media/document/AFD-070803-062.pdf (last visited Nov. 12, 2012).

- 2007 Joint Statement of Working Group B on trade related matters.[26] The Statement relayed the purpose of the Group, which is to address concerns about trade issues in GNSS services, augmentations, and value-added services. The Parties exchanged information about U.S. and E.U. industry interests in *GPS* and *Galileo*, and discussed the U.S. National Table of Frequency Allocations, as well as the *Galileo* concessionaire. Finally, the Group adopted a policy of expanding the public's knowledge of the usefulness of the compatible *GPS-Galileo* GNSS.

- 2008 Joint Statement on GPS and Galileo Cooperation.[27] Arising from the first plenary meeting about GNSS cooperation, the U.S. and E.C. undertook the critical step of reaffirming their commitment to the 2004 Agreement. Each side showed the current status of their systems, and the U.S. once more affirmed its commitment to provide the standard positioning service (SPS) for free of direct user fees. Meanwhile, Europe had begun procurement of the *Galileo* system. Both parties noted that they believed the interoperability and compatibility of the two systems with each other and eventually other GNSS systems would lead to continued improved commercial growth and international cooperation. The Statement also reported on the progress of the improved common civil signal, while the working group on trade noted success in "opening channels of communication" regarding fair trade, barriers to global markets in GNSS services, equipment and applications, etc. Finally, the Parties expressed a desire for continued cooperation in PNT matters.

- 2010 Joint Statement on Improved Performance from Receivers.[28] A working group "completed an assessment of

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[26] United States-European Union GPS-Galileo Working Group "B" on Trade & Civil Applications U.S. Department of Commerce, Washington D.C., Jan. 17, 2007, *available at* http://www.gps.gov/policy/cooperation/europe/2007/working-group-b/ (last visited Nov. 28 2012).

[27] *Joint Statement on GPS and Galileo Cooperation by Representatives of the United States of America, the European Community and its Member States*, 23 Oct. 2008, *available at* http://www.gps.gov/policy/cooperation/europe/2008/joint-statement/ (last visited Nov. 28, 2012).

[28] *Joint Statement, U.S. and E.U. Announce Improved Performance from Receivers Using both GPS and Galileo Combined Performance* (July 30, 2010), *available at*

> the global, combined performance for *GPS* Space-Based Augmentation System (SBAS) receivers using the European Geostationary Navigation Overlay Service (EGNOS) and the *GPS* Wide Area Augmentation System (WAAS) supporting safety-of-life applications. The results confirmed improved availability for a wide range of aviation services in both hemispheres and significantly improved robustness to *GPS* satellite outages." The working group also investigated the interoperability of *GPS III* and *Galileo* open civil services, and noted that the combined system enhanced performance in difficult areas (such as tall buildings, trees, or other objects that obscure access to the sky). The consultations produced two additional papers: "Combined Performances for SBAS Receivers Using WAAS and EGNOS," and "Combined Performances for Open GPS/Galileo Receivers."[29] The Statement notes the new phase in cooperation between the Parties as focusing on safety of life services, especially through changing SBAS and using *GPS-Galileo* open signals. The Statement makes efforts to show these products of cooperation continue the commitment to compatibility and interoperability as prescribed by the 2004 Agreement. The Statement closes with the assurance that the U.S. and E.U. will continue to work together to enhance the future interoperability and compatibility issues of PNT services.[30]

D. Ambiguous Language

A stated purpose of the 2004 Agreement was continuation of peaceful interaction in space. The above agreements and joint statements, as well as the productivity of the working groups on GNSS matters, have all shown this goal is being seriously implemented by the U.S. and the E.U. However, the future of U.S.-E.U. interaction in space based PNT activities is still uncertain, both because *Galileo* is still in its infancy, and, perhaps more importantly, the precise meaning behind several

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http://www.gps.gov/policy/cooperation/europe/2010/working-group-c/ (last visited Nov. 12, 2012) [hereinafter *Joint Statement Receivers*].

[29] Links to both of these papers may be found via the ec.europa.eu website.

[30] *U.S. Statement from COPUOS Science and Technology Subcommittee*, GPS.GOV (Feb. 10, 2011) *available at* http://www.gps.gov/news/2011/02/COPUOS/.

of the clauses and statements in the Agreement are murky, at best. To ensure that the peaceful design of the Agreement may be carried out effectively, its language must be analyzed for potentially ambiguous or questionable provisions.

The accountability of both Parties to the Agreement depends on interpretation of any such ambiguous language, and their working relationship is contingent upon a common understanding of the obligations therein entailed. Indeed, peace and security extend into space by virtue of the legal relationships established by the Agreement. It provides for cooperation and the promotion of peace (Article 1(1)), while also providing for national security concerns (Article 11(2)). Signals governed by the Agreement are produced from space based assets, the use of which holds major implications for peace both on Earth and in space itself. Cooperation on Earth regarding global navigation satellite systems and space based assets would pave the way for continued peaceful interaction in space itself, whereas dissention and willful neglect of the Agreement would produce international friction that could spoil peaceful cooperation in outer space. As each Party has repeatedly "expressed strong support for continued close cooperation" and have noted that they "will continue to work together on GPS-Galileo compatibility and interoperability issues,"[31] clarification of questionable language could serve only to ameliorate potential international discord.

Ultimately, then, identification and analysis of the language of the Agreement is key to its interpretation and, by extension, implementation in the international legal arena. This analysis is a two-step process. In the first, questionable language must be identified and parsed for meaning, whilst in the second, the very legal nature of the Agreement itself, writ large, must be discerned. The second step involves asking whether the Agreement qualifies, under international and local law, as a treaty between two parties or as something very different. Other possibilities lend themselves; Memoranda of Understanding (MOUs), Exchanges of Notes, or even (on a more domestic U.S.-level) Executive Agreements are all possible formats filled

[31] *Joint Statement Receivers*, *supra* note 28.

by the Agreement, and they all have their own associated international and domestic obligations and interpretations. Determining the kind of legal arrangement the Agreement posits will also provide a framework for better ascertaining the meaning of its more peculiar clauses.

Delving into the first part of the analysis, questionable provisions in the Agreement must be determined. The language of Article 4(2) is particularly germane. Article 4(2) of the Agreement reads "[t]he Parties agree that GPS and Galileo shall be radio frequency compatible. This paragraph shall not apply locally to areas of military operations. The parties shall not unduly disrupt or degrade signals available for civil use."[32] The latter provision describing 'undue disruption or degradation,' as it were, is certainly unclear. From the perspective of a legal agreement, what does it mean to be 'undue'? Different interpretations of the language from Article 4(2) could lead to substantially divergent policy decisions from the parties to the Agreement, the result of which could be inconsistent application of policies, significant economic damage inconsistent with the goals of either Party or their eager industries, or generation of international ill will harmful to peaceful relations on Earth and in space.

However, peace and security are not served by the uncertain language of Article 4(2). What the European Union considers undue degradation or disruption of signals could vary diametrically from the views of the United States. The possibility arises that one Party may use the Agreement to function as a heavy hand to encourage the other Party to adopt policy or economic decisions more amenable to the first Party. For example, the E.U. may threaten to degrade signals from Galileo if the U.S. were to conduct anti-satellite (ASAT) testing. Should the U.S. decide to conduct the ASAT testing regardless of the E.U. position, their ability to rely on Galileo data could be compromised. As long as the E.U. reasonably argues their degradation was not undue, they will not have violated the provisions of the Agreement. The U.S. could react in a similar fashion to policy

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[32] Agreement, *supra* note 1, at art. 4(2).

decisions of the E.U. deemed unfavorable to U.S. interests. While a spirit of international ill-will should never be assumed, the contexts of the Agreement demand a certain definitiveness to language that otherwise could open the door to international discord. Clarification of this clause would allow an understanding of what it means to be "undue," and this in turn would enable the Agreement to serve as an instrument of peace and economic growth. Mechanisms of linguistic interpretation are available, especially in the case of treaties, and these shall be explored *infra* in the section covering treaty law.

Article 6, governing non-discrimination in trade relations, seems clear enough at first glance. The Parties are not to engage in trade discrimination regarding GNSS timing signals, value-added services, or augmentations, nor should either party employ "measures with respect to goods and services"[33] related to such signals and services that would be disguised restrictions. But what constitutes such 'measures'? Could one Party's tariffs, deemed necessary and fair by its legislative authority, be another Party's 'disguised restrictions'? Perhaps this is why the drafters saw fit to establish, in Art. 6(3), a working group to suss out these matters. Whatever may be the case, some troubles have already arisen, as with the United States trade report that complained of lack of access to *Galileo* signal test equipment, as well as lack of information regarding "licenses to sell products . . . derived from Galileo Open Service Documentation."[34] On the other hand, some U.S. industry sources have been pleased with the progress in gaining access to *Galileo* equipment thus far,[35] indicating that perhaps in some respects, at least for commercial operators, the language in Art. 6 is either clear enough for business, or that the ambiguity is irrelevant. Conversely, U.S. industry has complained about not re-

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[33] Agreement, *supra* note 1, at art. 6(2).

[34] USTR Report to Congress on U.S. Equipment Industry Access to the Galileo Program and Markets, Office of the United States Trade Representative, *available at* http://www.ustr.gov/sites/default/files/Galileo%20Report%20Final.pdf [hereinafter USTR Report]; *see also* Glen Gibbons, *U.S. Access to Europe's Galileo Program Markets Subject of Trade Rep Report*, INSIDE GNSS (July 17, 2009) http://www.insidegnss.com/node/1598.

[35] Comments, United States GPS Industry Council, Doc. USTR-2009-0010-0004.

ceiving information on how to license the E6 signal, though these sources are hopeful for continued cooperation between the U.S. and E.C., noting that "as emerging national GNSS systems become interoperable with *GPS*, we believe that open GNSS markets are essential in order to sustain the GNSS utility."[36] For its part, the E.C, riposte noted that intellectual property rights and licensing issues were close to being solved, and that once this was done, the information would be promptly transmitted to the U.S.[37]

Article 7(1) notes that with an exception for "reasons of national security," the parties shall not restrict their PNT information via their open systems to the end-users. The question, here, is what is it exactly that counts as 'national security'? Is this purely a military term, or might it include more esoteric or non-traditional governmental prerogatives? One might speculate that the U.S. 'War on Terror'[38] could serve as an excuse to restrict PNT to end users in cases where the military or Departtment of State feels such end-users could utilize the information for maleficent ends. Domestically, this is unlikely to occur within the U.S., as civil commercial interests could potentially be badly damaged by any disruption in PNT; nevertheless, it remains a possibility so long as the exact meaning of 'national security' remains elusive.

Art. 7(2) is also a bit obscure, noting that the Parties "shall endeavour to provide signals intended for safety of life services." Obviously, this comports with both Parties' intentions to create search and rescue services built out of the 60-satellite mega-constellation of the future combined *GPS-Galileo*, but the language 'endeavour' is somewhat perplexing. Are the Parties merely supposed to attempt to provide such signals, perhaps giving it the 'old college-try'? Or are they seriously expected to provide the signals, fulfilling their part in the greater S&R scheme? If they wanted to close the book on the question, per-

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[36] *Id.*

[37] Comments, European Community, Doc. USTR-2009-0010-0003.

[38] Or the "overseas contingency operations", in the Obama Administration's terminology. *See* Oliver Burkeman, *Obama Administration Says Goodbye to 'War on Terror',* THE GUARDIAN (March 25, 2008), *available at* http://www.guardian.co.uk/world/2009/mar/25/obama-war-terror-overseas-contingency-operations.

haps the drafters should have omitted the word 'endeavour' altogether, making the obligation for each side to provide such signals absolute.

Art. 16 notes that "Each Party shall bear the costs of fulfilling its respective responsibilities under this Agreement. Obligations of each Party pursuant to this Agreement are subject to the availability of appropriated funds." The obligations, then, of each Party depend on whether or not they are able to appropriate funding? Does this not put the implementation of the Agreement into doubt, based on the sea-changes often wrought by shifting of political tides? Recent fiscal hawkishness of the U.S. House of Representatives may give the Parties pause, as any "excess" is seen as fodder for the chopping block[39]–one might argue this would apply to creating the new search and rescue service, opening better trade for GNSS equipment and services, or setting the standards and regulations that affect PNT service. The E.U. is not immune to political changes and the tectonic fiscal movements that so often accompany them—will they default on obligations if they cannot procure sufficient funding? If either party has funding difficulties, the entire Agreement could be reduced to little more than good intentions, unless Art. 16 is not meant to be read with such draconian rigor. Though less obscure than the previous examples, this too deserves further explication.

Without a solid attempt at clarifying these ambiguities, the Agreement, meant to propel the Parties forward into a gilded future of economic prosperity and international cooperation crafted from the new age of GNSS may instead, it seems, stand athwart such progress.

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[39] *See e.g. House Seeks to Cut Tens of Millions from Congress' Own Budget*, POLITICO (June 6, 2011), http://www.politico.com/blogs/glennthrush/0711/House_GOP_seeks_to_cut_tens_of_millions_from_Congress_own_budget.html. This is in keeping with the House's recent efforts to drastically slash the size of the federal budget, as well as with attempts to pass a balanced budget amendment to the U.S. Constitution in return for increasing the federal deficit limits. *See* David Rogers, *Debt Deal Momentum Builds as House Resists*, POLITICO (July 19, 2011), http://www.politico.com/news/stories/0711/59421.html.

E. Treaty or No? The Need to Determine the Nature of the Agreement

As alluded to above, the particular kind of instrument the Agreement takes is crucial to understanding the methodology used to interpret both its ambiguous language, as well as the power it has to bind both Parties. Thus, key to its application is determining *what* exactly it is. While this exercise may appear trite at first glance, the ramifications of following the Agreement to the letter obviate such concerns. Is the Agreement a treaty, that most sacred and venerable of international accords? Does the Agreement better fit the form of an MOU, or perhaps a more informal (but still influential) exchange of notes? Or does it best fit the odd quasi-legislative tool so often utilized by the executive branch in the United States—the executive agreement?

Of these and other options, treaties have the most varied and complete legal history from which to draw conclusions. Entire volumes are dedicated this sacrosanct form, written by scholars with far greater expertise in the matter than this author. This article, then, does not claim to espouse novel theoretical understandings of the treaty form, nor does it have the room for fleshing out every iteration and formality associated therewith. It does, however, intend to show that treaties lend themselves to analysis in somewhat predictable and reliable ways, as the next section will demonstrate.

MOUs and exchanges of notes, while much less formal than treaties, are still international interactions worthy of consideration. Their weaker legal abilities can render a starkly different picture of future interactions under the Agreement than if it were thought of as a treaty, but they produce intriguing results regardless. Moreover, these instruments can be highly persuasive in the arena of international public opinion and this, in turn, affects policy decisions that impinge on global navigation satellite systems and their derivative aspects.

Finally, the curious case could arise in which one Party sees the Agreement as one type of instrument, and the other Party sees it as another. Presumably, diplomats would endeavour to avoid such a bungling of intentions, but one cannot discount the

possibility that, e.g., the United States may consider the Agreement an MOU, while the EU thinks of it as an exchange of notes. Determining this essential quality would expedite smoother applications of the obligations contained within, and assure end-users that the promised bounties would in fact be forthcoming.

II. TREATY LAW AND OTHER INTERNATIONAL AGREEMENTS

A. The Treaty

Before swirling down the eddies of international legal interpretation of the Agreement, it is sensible to first assess the concept of that most potent of international agreements—the treaty. Defining a treaty is deceptively challenging. The common perception is that a treaty is an accord between two States, formalized typically in writing, signed by the appropriate sovereigns, and, in some instances, ratified by State legislatures. This conception is not far from the truth, and much jurisprudence has identified it with similar language. Chief Justice Marshall of the United States Supreme Court, writing in 1829 about a case involving the Treaty of St. Ildefonso, noted that "a treaty is in its nature a contract between two nations, not a legislative act. It does not generally effect of itself the object to be accomplished, especially so far as its operation is infra-territorial, but is carried into execution by the sovereign power of the respective parties to the instrument."[40] In a later case, Justice Miller of the Supreme Court stated more succinctly, "a treaty is primarily a compact between independent nations. It depends for the enforcement of its provisions on the interest and the honor of the governments which are party to it."[41] Shaw largely agrees, defining a treaty as "basically an agreement between parties on the international scene."[42]

Not only is this kind of agreement characteristically simple in form (though often ranging from trifling to monumental in

[40] Foster v. Neilson, 2 Pet. 253, at 314 (1829).
[41] Head Money Cases, 112 U.S. 589, at 598 (1884).
[42] MALCOLM N. SHAW, INTERNATIONAL LAW 903 (6th ed., Cambridge University Press, 2008).

effect), it is well established in the international community. Treaties are ingrained as a customary method of settling debates, defining terms, sorting business, ending wars, establishing alliances, determining borders, and granting rights or privileges. Their tendency at shaping much of the world's history has given treaties an exalted place among academicians and politicians alike. Indeed, "in my judgment the solemn treaty form which traditionally has characterized international covenants of grave importance should always be used when nations expect to be bound over long periods of time in matters affecting the general public welfare. Treaties are not easily amended nor do peace loving peoples easily disregard them."[43]

Custom, of course, is comprised of state practice—typically built over a lengthy period of time—and *opinio juris*,[44] and the treaty has been the beneficiary of both for hundreds of years. If States are thought of as distinctive international personalities, then "no simpler method of reflecting the agreed objectives of states really exists,"[45] Additionally, these agreements can be between two States, or many—bilateral or multilateral. It is even feasible to have a treaty between a State and an international organization or between one organization and another.[46]

But as is typical of law, nothing is ever quite so simple. There are many types of agreements between States, many of which would never be accorded the status of 'treaty' in modern times. Thus, deciding whether an instrument is or is not a

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[43] John Cobb Cooper, *The Proposed Multilateral Agreement on Commercial Rights in International Civil Air Transport*, 14 J. AIR L. & COM. 129 (1947).

[44] This is not always necessary, according to some authorities. *See* BIN CHENG, STUDIES IN INTERNATIONAL SPACE LAW 138-39 (Oxford: Oxford University Press, 1997)(strenuously defending the possibility of instantaneous customary law). This is especially true in the era of space flight where, as was seen with Sputnik and other satellites, most States did not complain about the passage of these satellites over their territory, creating, in the minds of some scholars, instant custom that this type of activity was acceptable, even in the absence of a treaty (at the time) confirming this belief.

[45] SHAW, *supra* note 42, at 903.

[46] *See* the *Vienna Convention on Treaties Between States and International Organizations*, Doc. A/CONF.129/15 [hereinafter *Vienna Convention Organizations*]. This Convention, though, is not yet in force. *See* United Nations Treaty Collections, *available at* http://treaties.un.org/Pages/ViewDetails.aspx?src=TREATY&mtdsg_no=XXIII-3&chapter=23&lang=en (last visited Nov. 28, 2012).

treaty sometimes requires divining the intent of the parties involved. This process can involve many avenues of investigation, including the drafting history, the circumstances—both internationally and domestically—that led to the drafting, the history of interaction between the States, the language of the instrument, and, to a lesser extent, the name of the instrument. Complicating matters, the instrument is not always called a 'treaty' in its title. Sometimes these agreements go by concord, protocol, covenant, charter, or act, among others.[47] In others, States may call an agreement a treaty, even though it is merely a MOU or contractual arrangement.[48] Language that often lends itself to treaties includes strong wording such as "'shall', 'agree', 'undertake', 'rights', 'obligations' and 'enter into force'"[49] Circumstances that lend credence to the belief an agreement is a treaty are sometimes fortuitously obvious, as when two States at war come together to end hostilities by the signing of a formal document (e.g., the Treaty of Versailles ending World War I). In other instances, the situation that gives rise to the treaty is less overt.

Formalities often distinguish the treaty from its less-restrictive siblings. Typically, a treaty is a signed agreement, and the individuals signing the document are authorized governmental agents who speak with the authority of their sovereign. The signing is a form of publicly declared consent to be bound, but it is not always needed to constitute a treaty.[50] The format of the instrument will often have typical provisions regarding entry into force and deposition of instruments of ratification. Also, States tend to register their treaties with the United Nations Secretariat, an action they must take if they foresee the possibility that they will need to discuss the instrument before the UN.[51]

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[47] SHAW, *supra* note 42, at 904.

[48] ANTHONY AUST, MODERN TREATY LAW AND PRACTICE 40-41 (Cambridge University Press, 2007).

[49] *Id.* at 33.

[50] *Id.* at 24.

[51] Charter of the United Nations and Statute of the International Court of Justice, art. 102(1-2), June 26,1945, 1 UNTS XVI [hereinafter UN Charter].

Parties' behavior towards one another can also serve as a clue about their intention to form a treaty or not. Consistent application of the instrument's provisions is a positive sign. Treaty obligations must be fulfilled by the parties in good faith,[52] following the timeworn rule of *pacta sunt servanda*. After all, the functions of a treaty would be meaningless without the active attempt, by all involved, to follow the very guidelines they contractually agreed to by the most formal of means. Most international law depends, for its efficacy, on the self-enforcement of the concerned States. Furthermore, States would not agree so readily to form compacts with one another in the absence of the expectation that the resultant provisions would be carried out.

B. The Vienna Convention

Perhaps the most convincing method for determining whether something is a treaty, and for analyzing its meaning once said determination has been made, is to consult the 1969 Vienna Convention on the Law of Treaties.[53] Sometimes nicknamed the Convention on Conventions, this instrument grew out of the need States saw for formalizing procedure for analyzing the treaties they signed with one another. One might think that States would know what they meant when they wrote down and signed such agreements, but differences of opinions as to specifics crop up often enough to legitimize the need for formal assistance. The number of parties and signatories evidence this world-wide need, what with there being 113 of the former and 45 of the latter as of March 03, 2013.[54] "The Vienna Convention on the Law of Treaties partly reflects customary international law and constitutes the basic framework for any discussion of the nature and characteristics of treaties."[55]

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[52] SHAW, *supra* note 42, at 903.

[53] Vienna Convention on the Law of Treaties, U.N. Doc. A/Conf.39/27; 1155 U.N.T.S. 331; 8 I.L.M. 679 (1969) *available at* http://untreaty.un.org/ilc/texts/instruments/english/conventions/1_1_1969.pdf [hereinafter Vienna Convention],

[54] Vienna Convention, Treaty Status, United Nations Treaty Collection, *available at* http://treaties.un.org/Pages/ViewDetailsIII.aspx?&src=TREATY&mtdsg_no=XXIII~1&chapter=23&Temp=mtdsg3&lang=en (last visited Nov. 28, 2012).

[55] SHAW, *supra* note 42, at 903.

The Vienna Convention defines treaty as "an international agreement concluded between States in written form and governed by international law, whether embodied in a single instrument or in two or more related instruments and whatever its particular designation."[56] This definition may be parsed into several sections. First, the agreement must be between States. This particular factor was, as noted above, expanded to include international organizations with the Vienna Convention on Treaties Between States and International Organizations.[57] Secondly, the agreement must be written—precluding any 'oral' agreements or traditions or customs that may exist between States. The third factor is that the agreement must be subject to international law, thereby subjecting States to the sizeable body of well-established global statutes, jurisprudence, and regulations. Fourthly, there may be one or more instruments comprising the agreement. Finally, the title of the instrument does not matter—it may be called an agreement, pact, treaty, et al.

While determining the exact legal status of the *GPS-Galileo* Agreement is certainly necessary, it need not be difficult. Given the combination of customary international law, the understanding of what constitutes treaties both internationally and at the US domestic level (considering, e.g., cases such as *Head Money Cases*), and finally the definition of what constitutes a treaty under the Vienna Convention, it is conclusive that the *GPS-Galileo* Agreement is a treaty from an international legal perspective. The larger concern, discussed *infra*, is whether the obligations to the treaty can be properly effectuated under the U.S. domestic legal regime.

C. Treaty Interpretation under the Vienna Convention

The Vienna Convention's chief asset may be its articles assisting in treaty interpretation. Articles 31 through 33 provide a clear framework, with 31 and 32 of paramount significance. Article 33 primarily concerns interpretation of treaties that

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[56] Vienna Convention, *supra* note 53 at art. 2(1)(a).
[57] Vienna Convention Organizations, *supra* note 46.

have been authenticated in two or more languages. Article 31 constitutes the crux of the Convention's efforts at consolidating interpretation. Article 32 provides further support, should Article 31 prove insufficient to solve the question at hand.

Article 31 lays out a fundamental principle already enshrined in customary international law: treaties are to be interpreted in good faith "in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose."[58] Art. 31 notes an exception to the 'ordinary meaning' test comes when the parties have agreed to a special meaning for a term. Presumably, this special meaning would be available in the definitions section commonly found in international agreements. Context should also take account of other agreements that accompany or follow the primary agreement, so long as they are related. A treaty's preamble and annexes are also to give context. Finally, Article 31 makes clear that all relevant rules of international law that are applicable between the parties should also be taken into consideration.

Seated in its linguistic malleability, Art. 31's power enables inquisitive scholars and judicious policy-makers with a practical tool for resolving potential dilemma. The concept of a word or phrase's ordinary meaning seems intuitively simple to most, and it alleviates temptation to burrow into obfuscatory legal doctrine or dicker with philosophical complexity. The weakness in the problem with using the 'ordinary meaning' of a word, however, is that this itself is an ambiguous phrase, open to a multiplicity of interpretations depending on subjective worldviews and experiences. Much of language is flitting, effervescent, or fluid, while the meaning of language is rarely truly and absolutely definitive. Even so, this is the mechanism set forth by the Convention, and it is a pragmatic, if imperfect, interpretive implement.

The Convention also provides Article 32 as a means to enhance treaty interpretation with other sources, noting "recourse may be had to supplementary means of interpretation . . . ", in-

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[58] Vienna Convention, *supra* note 53, at art. 31(1).

cluding the drafting history of the work and the circumstances in which the agreement was concluded in instances where they are needed to interpret the meaning that results from applying Art. 31. In situations where Art. 31 would lead to ridiculous results, or where following it would confuse the matter further, alternate sources may be consulted.[59] The question naturally arises as to what sources may be consulted and which should be as opposed to those that should be discarded. Since the Convention is not clear on the matter, according to its own Art. 31, one would need to interpret 'supplementary means of interpretation' according to its ordinary meaning, which, unrestricted by further instruction, could mean just about anything. It would be folly to suggest a court or congress between States would utilize frivolous or superficial sources, but the absence of defining modifiers certainly opens the gates of interpretation quite wide.

Perhaps one would do well to utilize the Statute of the International Court of Justice as an exemplar. The Statute identifies four primary sources of law that the Court can utilize to decide cases submitted to its jurisdiction. These include: 1) international conventions (treaties, etc.) that establish rules recognized by the States involved; 2) customary international law; 3) general principles of international law; and 4) opinions and writings of the most qualified publicists in a field, as well as judicial proceedings.[60] Certainly in determining the meaning behind a treaty, a State could find some guidance from other similar treaties it has adopted. General principles of international law—such as that States are sovereign over their territory, or instances of *jus cogens*, such as States may not commit genocide—are readily available for application; furthermore, the 'most qualified publicists' could serve to identify the helpful norms. Along with the *travaux préparatoires*, the context in which it was drafted, and the practice of each State in fulfilling its obligations, even the most indecipherable treaty will eventually yield to a certain understanding.

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[59] *Id.* at art. 32(a-b).

[60] Statute of the International Court of Justice, UN Charter, *supra* note 51, at art. 38(1) [hereinafter ICJ Statute].

Given the international legal status of the GPS-Galileo Agreement as treaty, the Vienna Convention, as well as customary language and formalities associated with treaty-making, may be utilized to analyze both the structure and meaning of the Agreement. In this way, some of the unclear language may at the very least be subjected to the international law tool-kit provided by the above sources.

First, the 'treaty language' of the Agreement should be determined. The Agreement is replete with such terminology; indeed, the word 'shall,' conveying a sense of absolute requirement, appears no fewer than sixty-four times in the Agreement. 'Agree', and its various iterations (agreement, have agreed, etc.), appears seventy-one times, while obligation(s), conveying a sense of international expectation and responsibility, occurs five times. Right(s) occurs three times, while Article 20 specifically governs 'entry into force.' There is even a procedure for amending the Agreement that requires States to utilize their internal approval procedures if they wish to accede to a change—suggestive of a need to ratify any changes.[61]

Structurally, the Agreement has the visual appearance of a treaty. There is a preamble, describing sentiments, past procedures, and future desires, and an Annex (containing critical information on *GPS* and *Galileo* signal structures). Sandwiched in between are twenty articles, including a significant 'definitions' section designed to remove questions about terminology, some of which is technical. Finally, the Agreement was signed by both sides at a formal gathering, being completed at Dromoland Castle, Ireland.

The context surrounding the drafting suggests both Parties believed the subject matter to be critical for continued civil, commercial, and scientific progress. Both Parties have repeatedly stated their industries rely on global navigation satellite services and that the continued services of a *Galileo-GPS* effort would be worth tens and possibly hundreds of billions of euros. The Agreement focuses on civil service provision, but does not fail to deflect concerns regarding military usage of GNSS. The

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[61] Agreement, *supra* note 1, at art. 20(6).

Preamble states that the U.S. intends to continue its free-of-direct-user-fees *GPS* service, confirming what multiple U.S. PNT policies have claimed. The multiple critical interests at stake provide persuasive evidence that the Parties saw the Agreement as more than a mere gentlemen's agreement, but rather as a binding treaty

The continued actions of the Parties involved demonstrate that both sides take their obligations under the Agreement with the utmost seriousness. Multiple further agreements, joint statements, working group reports, the U.S. 2011 COPUOS report, and even the 2009 US Trade Report eliminate any doubt that the Parties intend to continue with the Agreement as written, making every effort along the way to ensure *GPS* and *Galileo* will work ably together in the near future.

It remains, then, to subject the Agreement's ambiguous language to the test of treaty interpretation, using the toolkit Article 31 of the Vienna Convention provides.

Article 4(2) deserves first analysis. The first sentence concerning radio compatibility is a technical issue and need not be dissected here. The diabolical confusion created in this clause is the agreement that neither Party shall 'unduly disrupt or degrade' signals. Art. 31 recommends using the ordinary meaning in interpreting uncertain treaty language. In this instance, the adverb 'unduly' can be reduced to its adjectival root 'undue,' practically meaning undeserved or unwarranted. The Oxford English Dictionary defines undue as "unwarranted or inappropriate because excessive or disproportionate."[62] This definition suggests a somewhat subjective, deontological judgment, since by claiming something is unwarranted or inappropriate, the Agreement is essentially claiming there is a standard by which the parties *ought* to adhere. Not defining what exactly that standard is—i.e., what might be 'due' or deserved degradation or disruption—the Agreement then sets the reviewer in a linguistic loop: once we know what undue means, we then ask what might be due, only to discover it is not defined and be forced back to ask the original question once more. Indeed, the

[62] CONCISE OXFORD ENGLISH DICTIONARY, LUXURY EDITION, S.V. "undue" at 1574.

language implicitly suggests there could be a range of disruption and degradation that is acceptable, which in turn means that the Parties and their respective industries must be ready for potential interference with their interests.

Furthermore, it is unclear whether 'unduly disrupt or degrade' signals refers to the *extent* of disruption and degradation or, rather, to the triggering event which would allow such behavior. Could the U.S. decide again to consistently degrade its signals to all end-users in the future, as was done long ago under older PNT policies? Perhaps it could degrade the signal only enough to be off by five or six meters—perhaps the amount necessary to interfere with reliance on *GPS* signals for aviation landing and takeoff procedures. Would this be 'undue'? Could the E.U. disrupt *Galileo* signals for an hour here or there simply to see how the markets and end-users might respond? Would either Party need to wait to act until the other issues a diplomatic insult or international policy with which the other Party heartily disagrees? Common sense may aid the reviewer here. The clause probably indicates that both Parties undertake not to disrupt or degrade signals but for highly exceptional circumstances. Defining undue as 'unwarranted' suggests a rather serious event would need to pass to create acceptable instances of degradation and disruption. Additionally, it may be necessary to occasionally disrupt GNSS signals due to repositioning of satellites—an innocent act that would likely not incur the ire of the Agreement. Such acts may be the only instances in which disruption or degradation would not be 'undue.' Ultimately, though, the language alone does not solve the ambiguity.

If Art. 31 cannot provide a definitive solution, then Art. 32 allows additional sources to assist in clarification. Since provision of global navigation satellite systems is a relatively recent phenomenon, not much customary international law on when these signals may or may not be degraded exists. However, the U.S. has over several years and presidents suggested, in its national PNT policy and related announcements, that it would continue to provide PNT signals free of direct user fees to end-users and without degradation. Since millions of euros in world commerce already depend on the fidelity of *GPS*, and as States and commercial interests have planned long-term strategies on

the use of these signals, one might argue this dependence, coupled with U.S. State practice, has created a customary international law that *GPS* signals should always be provided in this manner. If so, then it would perhaps never be acceptable for the U.S., at least, to disrupt or degrade signals. General international law on satellite signal provision, like customary international law, is something of a legal Loch Ness Monster—it may exist, but most experts would claim to the contrary.

Insofar as information provided by a State's best publicized experts, little is written on this subject. Perhaps a tangential and markedly tenuous relationship exists with the concept of proportionality in the law of war.[63] Under that doctrine, one State's response to the attack of another ought to be proportional to the first attack, i.e., not excessive. This principle, sometimes identified as the Webster Doctrine,[64] has achieved international recognition. Speaking of the German invasion of Denmark and Norway in the events surrounding World War II, the International Military Tribunal at Nuremberg noted "it must be remembered that preventative action in foreign territory is justified only in case of an instant and overwhelming necessity for self-defense, *leaving no choice of means, and no moment of deliberation,*"[65] The doctrine thus allows a State to react to another's transgression, but only when there is no other choice, and the means by which they react must also be the only one warranted by the original act, i.e., it must be proportional. Though in a radically different situation, interpretation of the Agreement's 4(2) may suggest that one State may only avoid unduly disrupting or degrading signals if such actions represent a proportional response to other actions of similar weight and import. If, God forbid, the U.S. were ever to declare war on a

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[63] The author does not intend to suggest confounding language in the GNSS Agreement has direct applicability to the profundity of States waging war on one another. Rather, the intent is to highlight another arena of law where conceptions of proportionality are paramount. This article makes no definitive argument on current or future conceptions on developments in the law of war.

[64] *See* John Cobb Cooper, *Self-Defense in Outer Space…and the United Nations,* 5:2 SPACE DIGEST 51, at 53 (1962).

[65] International Military Tribunal at Nuremberg, *The Caroline Case*, II MOORE'S INT'L L. DIGEST 412 [emphasis added].

Member of the E.U., and in so doing disrupted its *GPS* signal to users in the theatre of battle, surely it would not be undue for Europe to respond in kind with *Galileo*.[66]

This interpretive process could be repeated for many of the questionable provisions in the Agreement. Potentially damaging to this analysis is the fact that neither the European Union, as a multinational body, nor the United States are parties to the Vienna Convention on the Law of Treaties.[67] The U.S. perspective is addressed below, but it should be noted that many of the States of the European Union are individually signatories of the Convention.

D. U.S. Domestic Treaty Interpretation

While under international law, the Agreement is clearly a treaty, the United States has additional laws and hurdles to clear before an agreement may be said to become a treaty. Many States can adopt treaties into their domestic province merely through the act of signing—the United States is not such a State. Treaties hold a special power over U.S. domestic law, and are therefore governed by the Constitution of the United States. Of principle interest in describing the powers of the President of the United States, the U.S. Constitution notes that "He shall have Power, by and with the Advice and Consent of the Senate, to make Treaties, provided two thirds of the Senators present concur . . . ."[68]

The treaty power, then, is assigned to both the executive and the upper chamber of the legislature, and the threshold for compliance with the Constitution is fairly high. Both divisions of the government must find a way to concur in order to adopt a treaty, and as each branch serves as a check on the power of the other, this can, at times, prove challenging. This stringent requirement was designed to protect U.S. domestic law from too readily being replaced or supplemented by agreements with for-

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[66] Then again, if these two parties were at war with one another, it is likely they would not consider any treaties between them to be valid, at least for the duration of the conflict.

[67] Vienna Convention, Treaty Status, *supra* note 54.

[68] U.S. CONST. art. II, sec. 2, cl. 2.

eign States, and this, in turn, was of importance considering that according to the Constitution, "[t]his Constitution, and the Laws of the United States which shall be made in Pursuance thereof; and all Treaties made, or which shall be made, under the Authority of the United States, shall be the supreme Law of the Land."[69]

The notion of treaties as the 'law of the land' means that these agreements are given the same weight and legal significance as any other law passed by the United States Congress. As Justice Marshall wrote, "[i]n the United States, a different principle is established. Our constitution declares a treaty to be the law of the land. It is, consequently, to be regarded in courts of justice as equivalent to an act of the legislature . . . ."[70] When the United States commits to a treaty, that instrument affects the entire State, even though legislatively, only the Senate had a hand in passing it into existence. Typically, the House of Representatives would need to assist in the creation of law, but this Constitutional exception abrogates that normality.

A natural question follows: if the Congress has passed a statute governing global navigation satellite systems, and then the President and Senate adopt a new treaty (the *GPS-Galileo* Agreement, e.g.), and, furthermore, provisions in the treaty conflict with certain parts of the statute, then is a conflict of laws generated? "The answer is, that neither has any intrinsic superiority over the other and that therefore the one of later date will prevail."[71] Corwin notes that "a few judicial *dicta* . . . assert that the maxim *'leges posteriors priores contrarias abrogant* (later laws repeal earlier contradictory ones)' . . . carry the implication that the treaty-making power is capable of imparting

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[69] *Id.* at art. VI, cl. 2.

[70] *Foster*, *supra* note 40, at 314. *See also* THE FEDERALIST NO. 75, 504-505 (J. Cooke ed. 1961). In *Hauenstein v. Lynham*, the Court noted "It must always be borne in mind that the Constitution, laws, and treaties of the United States are as much a part of the law of every State as its own local laws and Constitution. This is a fundamental principle in our system of complex national polity." Hauenstein v. Lynham, 100 U.S. 483, 489-490 (1879).

[71] CONSTITUTION OF THE UNITED STATES ANALYSIS AND INTERPRETATION, S. DOC. No. 108-17, at 499 (2004) [hereinafter CONSTITUTION ANALYSIS].

to its engagements the quality of the 'law of the land.'"[72] The system thereby precludes international agreements of this kind from clashing with extant laws in insoluble ways, and the old makes room for the new. Thus, if it is determined that the *GPS-Galileo* Agreement is a treaty, its provisions should not be seen to conflict with any extant U.S. domestic obligations.

The specific method by which treaties are crafted in the United States deserves more detailed attention. The president is given the ability and mandate to craft treaties on behalf of the United States. Though the aforementioned Constitutional provision establishes a required symbiosis between the Senate and presidency, "he alone negotiates. Into the field of negotiation, the Senate cannot intrude; and Congress itself is powerless to invade it."[73] In the instance of the *GPS-Galileo* Agreement, it was the executive, under the ambit of the powers of the president, which negotiated on behalf of the United States—not the U.S. Senate. Despite its eventual veto power over treaty-making, the Senate does not have to be consulted by the president at any point before or during the drafting process.

However, the power to craft treaties is not exclusively in the hands of the president and Senate. The House of Representatives, although not given explicit mandate to interfere in creating these singular international agreements, nevertheless has *de facto* power over the implementation of any treaties requiring funds to operate. The Constitution gives the Congress the power to collect taxes and spend money on behalf of the United States,[74] and this cannot be achieved without the will of the House. This is true even when a treaty, properly entered into via the president-Senate constitutional mechanism, requires an explicit expenditure of funds by the United States. Willoughby notes "though the treaty making power is able to obligate the United States internationally to the payment of sums of money, it is not able itself to appropriate from the United States treasury the amounts called for, or compel the legislature to provide

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[72] EDWARD S. CORWIN, THE CONSTITUTION AND WHAT IT MEANS TODAY 134 (Princeton University Press, 1973).

[73] United States v. Curtiss-Wright Corp., 299 U.S. 304, 319 (1936).

[74] U.S. CONST., art. I, secs. 8-9.

for their payment."[75] Something of an oddity, this fact enables the House of Representatives to have more power over the treaty-making process than was apparently intended by Art. II. Despite this, negotiating treaties remains vested solely in the president.[76]

Yet, unlike many States, the U.S. decided not to invest the power of treaty-making exclusively to the president. Though, indeed, it was his power to negotiate such instruments, he was denied the unilateral authority so seemingly natural to an executive. Ultimately, the Framers decided the Senate would, by a two-thirds vote, hold approval for the president's efforts at international state-crafting. The reasons for this restriction are varied, but essentially they boil down to a distrust of executive power in the earliest days of the republic, borne of generations of conflict with the British Crown, culminating in an historic decision by a brazen colony to separate from its sovereign.[77] Mindful of the struggle with Britain just years before, "the

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[75] WESTEL WOODBURY WILLOUGHBY, 1 THE CONSTITUTIONAL LAW OF THE UNITED STATES 549 (New York: Baker, Voorhis and Company, 2d, 1929).

[76] Some case law has suggested that the president even has the power to determine whether a treaty is or is not any longer binding on the United States after a breach of obligations from the other State Party. *See* Charlton v. Kelly, 229 U.S. 447 (1913). This author would be sceptical of this power, as even if the president could determine, for domestic purposes, whether a treaty remained a governing force over the United States, failure to withdrawal from the agreement via means provided in the instrument itself, or otherwise under principles of international law, could cause the president to unwittingly commit a breach of international law on behalf of the United States. Additionally, *see also* Taylor v. Morton, Fed. Cas. No. 13,799 (1855)--With Justice Curtis noting that whether a foreign sovereign has violated a treaty or withdrawn voluntarily, amongst other things, is a political question that the judicial departments are not qualified to decide. Political questions were given to the executive and the legislature, and denied to the judiciary. Thus, if a conflict arose in which the U.S. claimed the EU was violating provisions on unduly degrading satellite signals, it would be for the President and/or the Congress to make that conclusion, rather than the Supreme Court.

[77] *See* THE UNITED STATES DECLARATION OF INDEPENDENCE (U.S. 1776). The list of grievances against King George III was extensive, noting, among other delinquencies, "He has refused his Assent to Laws, the most wholesome and necessary for the public good…He has forbidden his Governors to pass Laws of immediate and pressing importance…He has dissolved Representative Houses repeatedly…He has obstructed the Administration of Justice by refusing his Assent to Laws for establishing Judiciary Powers…For quartering large bodies of armed troops among us…For imposing Taxes on us without our Consent…He has plundered our seas, ravaged our coasts, burnt our towns, and destroyed the lives of our people…", et al. *Id.*

usurpation of power on the part of a single executive was a present and continuous danger."[78]

The first attempt at governing the United States culminated in the Articles of Confederation, whose articles greatly restricted the power of a centralized government. The Articles even delegated, in its ninth provision, that the power to craft treaties was vested in the Congress, albeit with the assent of the several states.[79] Eventually the Articles were determined to be insufficient to govern the new American Experiment, and the Constitution of the United States of America was drafted to replace and improve upon previous law. Eventually, the Senate was given less power over treaties than in the Articles, but it nevertheless had a critical role to play in giving (or not) consent to treaties negotiated by the president. This role, drafted by the 'Committee of Eleven,' gave to the Senate the power to approve of presidential treaty-making with the advice and consent of two-thirds of the Senators present.[80] No doubt, this solution was hoped to enable the executive to function with the quality of power denied it in the Articles, whilst simultaneously denying autocratic power to unscrupulous leaders, "and withal there would be enough collaboration to prevent the President from seizing a sceptre and crown, especially in the making of peace."[81]

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[78] B. M. Thomson, *The Power of the Senate to Amend a Treaty*, 3 MICH. L. REV. 441 (1905).

[79] DENNA FRANK FLEMING, THE TREATY VETO OF THE AMERICAN SENATE 4 (New York: G.P. Putnam's Sons, 1930); for a general understanding of the evolution of the 2/3 treaty power of the U.S. Senate, *see generally id.* at 3-15; *see also* Missouri Pacific R. Co. v. Kansas, 248 U.S. 276, 283 (1919)("But this is not all, for the Journal of the Senate contains further evidence that the character of the two-thirds vote exacted by the Constitution (that is, two-thirds of a quorum) could not have been overlooked, since that Journal shows that at the very time the amendments just referred to were under consideration there were also pending other proposed amendments, dealing with the treaty and lawmaking power. Those concerning the treaty-making power provided that a two-thirds vote of all the members (instead of that proportion of a quorum) should be necessary to ratify a treaty dealing with enumerated subjects, and exacted even a larger proportionate vote of all the members in order to ratify a treaty dealing with other mentioned subjects….").

[80] *See James Madison's Journal of the Debates in the Constitutional Convention of 1787*, II, 240, 262, 299.

[81] FLEMING, *supra* note 79, at 15. Indeed, this temptation unto power has not abated in the human spirit with the passing of years. Speaking to the controversial organization La Raza, President Obama recently opined: "The idea of doing things on my own is very tempting, I promise you, not just on immigration reform. But that's not

Succinctly: the power to negotiate treaties is the president's alone; the power to ratify them, the Senate's.

E. The Vienna Convention and U.S. Law

Considering its importance in discerning meaning behind treaty provisions, the status of the Vienna Convention in the United States deserves attention. The most obvious question is whether the U.S. is a Party to the Convention. For better or worse, the United States has signed, but not ratified, the Vienna Convention.[82] As a result, the Convention is not the 'law of the land,' and cannot be said to override any conflicting provisions in U.S. statutory law. This fact does not mean the discussion should end here. Rather, judicial discord continues to crop up in discussion of the proper role, if any, of the Convention as applied to U.S. treaty obligations. Some lower courts have cited to the Convention positively, while the Supreme Court has overridden this sentiment. For instance, the Court of Appeals for the Second Circuit has noted "When resolving [questions about treaties] . . . we apply the rules of customary international law enunciated in the Vienna Convention on the Law of Treaties."[83] The Second Court noted, in another case, that the Convention "binds states together regardless of whether they are parties" as it is a "restatement of customary rules."[84]

In contrast, "notwithstanding the Vienna Convention's internationally authoritative status, the Supreme Court has never applied the Convention as U.S. law. In fact, since its entry into force in 1980, only two Supreme Court opinions have cited the Vienna Convention . . . no member of the Court has ever ap-

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how our system works. That's not how our democracy functions.", from Catherine E. Shoichet, *Obama: "I need a dance partner" on immigration reform*, CNN (July 25, 2011), http://edition.cnn.com/2011/POLITICS/07/25/obama.la.raza/.

[82] Vienna Convention, Treaty Status, *supra* note 54; *see also U.S. Treaties in Force, 2010*,, http://www.state.gov/documents/organization/143863.pdf (last visited Nov. 28, 2012).

[83] Fujitsu Ltd. v Fed. Exp. Corp., 247 F.3d 423, 433 (2d Cir. 2001).

[84] Chubb & Son, Inc. v Asiana Airlines, 214 F.3d 301, 308 (2d Cir. 2000).

pealed to the Vienna Convention for an independent and controlling decision."[85]

The Supreme Court's reticence to apply the Vienna Convention notwithstanding, would it be appropriate for U.S. courts to apply it in any event, using it, e.g., to solve the riddle of ambiguous language in the *GPS-Galileo* Agreement? The short answer is no—although there is a strong argument to be made that its provisions, independent of the Convention itself, are customary law that should be applied to the U.S. and its treaty relations regardless of the ratification status of the Convention which enshrines them. As to applying the Convention *qua* Convention, it is a matter of logic. If the United States could apply the Vienna Convention as law of the land, then, of necessity, it would have ratified the Convention in the Senate. The Senate has not ratified the Convention. Therefore, the U.S. cannot apply the Convention as law of the land—*modus tollens*.

Even if the United States had ratified the Convention, it is doubtful whether it could be applied without accompanying implementing legislation. The Supreme Court has repeatedly held that mere accession to a treaty, including ratification thereof, is insufficient to apply such law to the U.S. *unless* there is accompanying implementing law from the Congress, or if the treaty was self-executing. In the latter case, treaties merely addressing rights of private individuals could be once such instance.[86] In the former case, treaties typically require Congressional action to implement because they essentially establish a contract by one State with another, depending on each to fulfil its part in some grand bargain.[87] Justice Marshall noted "when the terms of the stipulation import a contract—when either of the parties engages to perform a particular act, the treaty addresses itself to the political, not the judicial department; and the legislature must execute the contract, before it can become a rule for the Court."[88]

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[85] Evan Criddle, *The Vienna Convention on the Law of Treaties in U.S. Treaty Interpretation*, 44 VA. J. INT'L L. 433-34 (2004).

[86] CONSTITUTION ANALYSIS, *supra* note 71, at 502.

[87] *Id.* at 501-02.

[88] *Foster*, *supra* note 40, at 314; *accord* Whitney v. Robertson, 124 U.S. 190, 194 (1888)("When the stipulations are not self-executing they can only be enforced pursuant

Following *stare decisis*, modern incarnations of the Supreme Court have continued to cite to the need for implementing legislation, and that this is required to enforce U.S. treaty obligations domestically. Two recent controversies involving Mexican nationals sentenced to be executed in the state of Texas are germane. In one, *Medellin v. Texas*, the Court took the case of Medellin because of the reliance on the International Court of Justice decision *Case Concerning Avena and Other Mexican Nationals,*[89] which determined Avena and several other Mexican nationals in the United States were entitled to review of their state convictions due to violations of the Vienna Convention on Consular Relations.[90] The Court wished to review the argument that the ICJ decision was applicable to the United States, and concluded that it did not.[91] After noting that the United States had withdrawn from general ICJ jurisdiction in 1985, and specific jurisdiction in 2005,[92] the Court also rejected the claim that the Optional Protocol, UN Charter, or ICJ Statute would create binding federal law in the United States without the appropriate implementing legislation which, the Court noted, was unquestionably absent.[93] To be clear, the Court did agree with the Bush Administration that international obligations existed on the part of the United States, "but not all international law obligations automatically constitute binding federal law enforceable in United States courts."[94]

Taking up a similar case in 2011, the Court, in *Leal v. Texas*, refuted international legal pressure to apply ICJ decisions in the United States without Congress enacting legislation to that effect.[95] Leal, a Mexican national convicted of kidnap-

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to legislation to carry them into effect . . . . If the treaty contains stipulations which are self-executing that is, require no legislation to make them operative, to that extent they have the force and effect of a legislative enactment.").

[89] Case Concerning Avena and Other Mexican Nationals (Mex. v. U. S.), 2004 I. C. J. 12 (Judgment of Mar. 31) (*Avena*).

[90] U.S. v. Medellin, 552 U.S. 491 (2008).

[91] *Id.*; the Court also determined that a decision by the Bush administration to enforce its obligations under the *Avena* case was not binding on the U.S.

[92] *Id.* at Part I(A).

[93] *Id.* at Part II.

[94] *Id.*

[95] Leal v. Texas, 564 U.S. __ (2011), at p. 3 of slip decision.

ping Adrea Sauceda, raping her with a stick, and finally beating her to death with a piece of asphalt,[96] relied on the defense that Congress should be allowed time to pass implementing legislation:

> Leal and the United States ask us to stay the execution so that Congress may consider whether to enact legislation implementing the *Avena* decision. Leal contends that the Due Process Clause prohibits Texas from executing him while such legislation is under consideration. This argument is meritless. The Due Process Clause does not prohibit a State from carrying out a lawful judgment in light of unenacted legislation that might someday authorize a collateral attack on that judgment.[97]

No matter how much the Justices or anyone else may wish the U.S. to follow its international law obligations (assuming such even continued to exist after the withdrawal from the ICJ jurisdiction), echoing the famous language of *Marbury v. Madison,*[98] the *per curiam* decision noted "[o]ur task is to rule on what the law is, not what it might eventually be."[99] Thus, if the Congress decides to enact legislation making ICJ cases the law of the land, inmates such as Leal would have a legal leg on which they might stand. The same necessity would be true of the *GPS-Galileo* Agreement, should that ever be ratified by the Senate.

Intriguingly, even if Congress did ratify the Convention, it could not be forced to pass the required implementing legislation. The Constitution leaves it to the Congress to decide when, if ever, to utilize its powers.[100] Neither a foreign entity, nor the

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[96] *Id.* at 1.; Leal admitted his complicity in the crime before his eventual execution, *see* Michelle Mondo, *S.A. Teen's Killer Dies with an Apology* My SA (July 8, 2011), http://www.mysanantonio.com/news/local_news/article/About-to-die-Leal-apologizes-for-killing-S-A-1456909.php; *see also* Nathan Koppel, *Texas Executes Leal Despite White House Objections* THE WALL STREET JOURNAL (July 8, 2011), *available at* http://blogs.wsj.com/law/2011/07/08/texas-executes-leal-despite-white-house-objections/.

[97] *Leal*, *supra* note 95, at 2.

[98] Marbury v. Madison, 5 U.S. 137, 177 (1803)("It is emphatically the province and duty of the Judicial Department to say what the law is.") (i.e., what the law is, not what it should be).

[99] *Leal*, *supra* note 95, at 2.

[100] CORWIN, *supra* note 72, at 135.

president himself can do any more than pressure the Congress to act, though generally this is unnecessary, and in the case of an eventual ratification of the *GPS-Galileo* Agreement, the Congress would likely move willingly and without undue delay to pass implementing legislation. The provisions of the Agreement, suggestive of improving commercial relations between the U.S. and the E.U., would be incentive enough to pass the appropriate laws. Moreover, the United States ought to consider herself bound by, if not the Vienna Convention on the Law of Treaties itself, then at the very least by the principles it espouses—most of which, it is safe to claim, have already entered into customary international law.[101] Indeed, for no other reason than to avoid trammelling international good will—a key currency in global interaction—the U.S. would do well to consider ratifying and then supplementing, with appropriate implementing legislation, the Convention.[102]

F. Executive Agreements

Many of the international agreements entered into by the United States do not possess the quality of being a treaty ratified by the Senate, yet they still have legal force and are a cru-

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[101] The United States Department of State has said that "the United States considers many of the provisions of the Vienna Convention on the Law of Treaties to constitute customary international law on the law of treaties.", *U.S. Dept. of State on the Vienna Convention*, http://www.state.gov/s/l/treaty/faqs/70139.htm (last visited Nov. 28, 2012).

[102] Such a codification should not prove overly controversial. There is a strong tradition in the common law for rules of customary international law to become enshrined in official national law. *Cf.* WILLIAM BLACKSTONE, 4 COMMENTARIES ON THE LAWS OF ENGLAND 53, Chapter the Fifth, of Offenses Against the Laws of Nations, (London: Cavendish Publishing Limited, 2001) ("since in England no royal power can introduce a new law, or suspend the execution of the old, therefore the law of nations (wherever any question arises which is properly the object of its jurisdiction) is here adopted in its full extent by the common law, and is held to be a part of the law of the land. And those acts of parliament, which have from time to time been made to enforce this universal law, or to facilitate the execution of its decisions, are not to be considered as introductive of any new rule, but merely as declaratory of the old fundamental constitutions of the kingdom; without which it must cease to be a part of the civilized world."). Substitute "Congress" for "Parliament", and you have an analogous situation in the modern United States as in Blackstone's England of centuries ago. The ratification process of the Senate, undertaken to enforce "from time to time" the laws promulgated by treaties (including customary international laws), serves a similar function to the passage of the "law of nations" by the parliament.

cial aspect of U.S. foreign policy. These kinds of agreements are typically known by the moniker 'executive agreement,' and come in at least two kinds: those that Congress authorizes the president to make on behalf of the United States, and those he may enter into by virtue of his powers as commander-in-chief.[103] Of the latter, the State Department's Foreign Affairs Manual notes the constitutional authority of the president extends from "the President's authority as Chief Executive to represent the nation in foreign affairs."[104] This vague description would seemingly allow the president to do quite a bit more than the Congress would perhaps prefer, though this is as much a political question as a constitutional one. However, some case law does support the president's ability to utilize executive agreements, noting that they too, like treaties, are to be treated as law of the land.[105]

One such example of Congressionally authorized executive agreements concerns trade relations with foreign States, where the president has been granted the authority to "enter into foreign trade agreements with foreign governments or instrumentalities thereof . . . to proclaim such modifications of existing duties and other import restrictions . . . as are required or appropriate to carry out any foreign trade agreement that the President has entered into hereunder."[106] The trade provisions of the *GPS-Galileo* Agreement arguably would fall under this authority. Other such agreements include such momentous decisions as the annexation of Texas and Hawaii as well as acquiring Samoa for the U.S.[107]

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[103] CORWIN, *supra* note 72, at 135; *see also* the United States Department of State, Foreign Affairs Manual, 721.2(2-3), http://www.state.gov/m/a/dir/regs/fam/ (last visited Nov. 28, 2012) [hereinafter FAM].

[104] FAM, *supra* note 103, at 721.2(3)(a).

[105] *See, e.g.*, United States v. Belmont, 301 U.S. 324 (1937), and United States v. Pink, 315 U.S. 203 (1942); this in spite of logic, which might dictate that if a treaty cannot be said to affect the U.S. legal realm without it being either self-executing or being accompanied by implementing legislation, then all the more doubt is cast on the effect of EA's on the U.S. Thus, if the Agreement is an EA, a jurisprudential quagmire could await those would tread so perilously on such reliance.

[106] 19 U.S.C. 1351(a)(1)(A-B).

[107] W. MCCLURE, INTERNATIONAL EXECUTIVE AGREEMENTS 62-67 (1941).

Insofar as executive agreements under the authority of the president as commander-in-chief, "many types of executive agreements comprise the ordinary daily grist of the diplomatic mill . . . [but they] become of constitutional significance when they constitute a determinative factor of future foreign policy and hence of the country's destiny."[108] Such agreements, affecting the destiny of the United States, have included agreements with Mexico over rights to pursue Indian raiders across the common border, as well as interactions with Spain over hostilities between the two States, and even procuring troops for, and then accepting the Protocol concerning the Boxer Rebellion in China.[109] The power of the president to undertake these agreements is surely necessary in foreign relations with other States; however, Congress may, from time to time, find disconcerting the power the president assumes unto himself without its approval. Corwin notes that "it would be more accordant with American ideas of government by law to require, before a purely executive agreement be applied in the field of private rights, that it be supplemented by a sanctioning act of Congress."[110] This notion, while amenable to ideas of proper democratic authority, might also take some of the force away from the ability of the commander-in-chief to accomplish goals on behalf of the United States—be this a good or bad potentiality.

Finally, some evidence suggests that the *GPS-Galileo* Agreement is an Executive Agreement, at least insofar as the U.S. is concerned. The aforementioned U.S. Trade Report notes that once the Member States of the EU had finished ratifying the Agreement, an exchange of notes would be made to bring "this executive agreement into force."[111] Coupled with the absence of the Agreement from the definitive list of U.S. Treaties in Force, prepared by the Treaty Affairs Staff at the U.S. Department of State, the *GPS-Galileo* Agreement is, by its omis-

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[108] CONSTITUTION ANALYSIS, *supra* note 71, at 522.
[109] *Id.* at 523-24.
[110] CORWIN, *supra* note 72, at 138.
[111] USTR Report, *supra* note 34, at 3.

sion, not considered a treaty by the U.S.[112] Moreover, the Department of State noted that they see the Agreement as a multilateral agreement that *is not* meant to set precedent for future agreements.[113] Presumably, if the Agreement is considered an executive agreement under U.S. law, it would be an instance of the president engaging in his responsibilities representing the United States in foreign affairs matters, per the Foreign Affairs Manual.

G. Clash of Agreements?

The importance of discerning how the United States views the *GPS-Galileo* Agreement, i.e., what kind of agreement, exactly, it is, is that the possibility is raised that the E.U. may potentially see the Agreement as a treaty (or at least interpreted and enforced much as a more formal agreement might be), where the U.S. may consider it to be of lesser force. In this situation, two Parties may begin discussion of obligations with different mechanisms and levels of commitment depending on the status of the Agreement in the respective Party positions. In turn, this could lead to further confusion about how each party is to act, and it may leave achieving many of the obligations to the political winds (e.g., whether the U.S. Congress is willing to go along with what the executive has 'committed' the country to doing, or whether the funds will be appropriable from the E.U. dispensaries). Indeed, Aust is aware of at least two occasions when a disagreement as to the status of an instrument led to confusion and discord.[114] In the United States, "since less weight is given to terminology, it is more difficult to predict whether a particular instrument will be regarded by the United States as a treaty or an MOU."[115] The possibility arises that the U.S. would see the Agreement as something of an

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[112] State Department, U.S. Treaties in Force, 2011, http://www.state.gov/documents/organization/169274.pdf (last visited Nov. 28, 2012). *See also Treaties in Force*, http://www.state.gov/s/l/treaty/tif/index.htm (last visited Nov. 28, 2012).

[113] *See* Exchange of Letters between Heinz Hilbrecht and Ralph Braibanti (in particular, May 10, 2004), http://www.state.gov/documents/organization/82787.pdf (last visited Nov. 28, 2012) [hereinafter Exchange of Letters].

[114] AUST, *supra* note 48, at 37.

[115] *Id.* at 40.

MOU, all the while calling itself something else entirely—after all, MOUs do sometimes constitute 'multilateral agreements.'[116] However, given the choice between classifying the Agreement as an MOU or Executive Agreement for the purposes of US law, this author concludes that an executive agreement better reflects the true status of the treaty at the domestic level.

The above analysis of US treaty law is germane for one primary reason: while the *GPS-Galileo* Agreement is clearly a treaty under international law, at the US domestic level it is certainly *not* a treaty. This is particularly vexing in instances in which the United States has clear international obligations that cannot be fulfilled without action at the domestic stage. As with *Avena* and *Leal*, the true test of the US commitment to the Agreement may come when it is asked to fulfill some obligation in accordance with the treaty, but it is unable to do so without Congressional action. Whether this eventuality must come to pass is questionable, but the possible legal quagmire is why it is critical to understand that, for the United States, the Agreement has a different status in two distinct jurisdictions. Consequently, should the United States wish not only to clarify its obligations under ambiguous terminology and provisions to the Agreement, but also to determine the level of its commitment to the international community and to the instrument itself, it would do well to prepare for possible discord between US domestic law and the Agreement--possibly by encouraging the Congress to take steps toward implementing legislation to enable the executive agreement to behave as the treaty it is meant to be at the international level. In the end, this would potentially save international headaches, as well as the billions invested in the future of the industry that could be endangered by the uncertain status of obligations between the Parties.

III. GNSS LIABILITY

Foremost among the issues surrounding the use of GNSS is the problem of liability. From the perspective of traditional conceptions of liability, global navigation satellite systems present

[116] *See, e.g.* Exchange of Letters, *supra* note 113.

a space-aged challenge worthy of attention. While there is not an overabundance of material on liability regarding space law, Christol reminds us that "international law, generally, as well as the Committee on the Peaceful Uses of Outer Space (COPUOS)-negotiated international agreements, applies to claims for damages resulting from space activities."[117] Though this article is not intended to serve as an in-depth exposition of liability law,[118] it would be an oversight not to include a survey of the most current law, as well as its evolution. Accordingly, this final section attempts to expound on liability law, beginning with the international treaty regime, followed by domestic and regional laws of the United States and European Union, continuing with the liability issues created by virtue of the *GPS-Galileo* Agreement, and concluding with suggestions for future law.

A. The International Treaty Regime

i. The Outer Space Treaty

In providing the first definitive guidance on space law, the Outer Space Treaty of 1967 briefly addressed liability in its Article VII. That article states:

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

The Outer Space Treaty thereby established the conception of liability for space-based incidents, be they those that occur on the planet itself, or beyond. The nations of the world thereby accepted that Earth-bound notions of liability would have to

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[117] CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 88 (Pergamon Press, 1982).

[118] For a fuller description of GNSS liability issues, *see* Rodriguez-Contreras Pérez, *supra* note 4.

follow humanity into space. Unfortunately, the conspicuous absence of specific liability provisions, including what exactly constitutes a 'launching state,' as well as what kind of liability would apply, and to what extent, cast the usefulness of this provision into some doubt.

ii. The Liability Convention

Sensitive of the weaknesses of liability in space matters, States Party to the Liability Convention of 1972 recognized the need for further action to supplement the Outer Space Treaty's good-intentions.[119] To that end, the Liability Convention[120] undertook to resolve the existing lacuna and remove lingering uncertainty. Of particular interest include:

- Article I, which defines damage as "loss of life, personal injury or other impairment of health; or loss of or damage to property of States or of persons, natural or juridical, or property of intergovernmental organization," and launching States as being those States who launch or procure the launching of a space object, as well as those States from whose territory or facilities space objects are launched.

- Article II, which notes "a launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight," establishes a strict regime for compensation on Earth, leaving no room for contributory or comparative negligence.[121]

- Article III, establishing a negligence standard for incidents in space itself: "in the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State,

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[119] Convention on International Liability for Damage Caused by Space Objects, *opened for signature* Mar. 29 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention], *at* Preamble ("Recognizing the need to elaborate effective international rules and procedures concerning liability for damage caused by space objects and to ensure, in particular, the prompt payment under the terms of this Convention of a full and equitable measure of compensation to victims of such damage….")

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

[121] *But see id.* at art. VI.

the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible."

- Article IV, In the event that one Party's space object causes damage in space (or on a celestial body) to another State Party, thereby causing damage to yet a third Party, then the first two Parties "shall be jointly and severally liable to the third State." The Article goes on to describe the extent to which each Party would be liable, noting that damage caused on earth to a third Party would make the first two Parties absolutely liable, whereas damage caused elsewhere would be apportioned according to the negligence theory articulated in Article III. The joint and several liability of this Article was influenced by a similar provision in the Rome Convention of 1952[122] for damage caused to third parties on the surface due to aircraft.[123]

iii. The Rescue and Return Agreement

The Rescue and Return Agreement discusses the ramifications of discovering space objects or their component parts in their jurisdictions (or on the high seas), noting that they shall do what they can practically do, with the help of the launching State if necessary, to return or hold the objects of the other State upon the latter's request. If the object or component parts are thought to be a hazard to the State in which they landed, the launching State is required to help take steps, under the direction of the Party in whose territory the object landed, to eliminate the harm. Finally, "expenses incurred in fulfilling obligations to recover and return a space object or its component parts . . . shall be borne by the launching authority." Thus, the Rescue and Return Agreement establishes liability of a kind for the launching State whose materials land in another State's jurisdictional areas, especially in instances in which the materials are deemed to be hazardous.

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[122] Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Oct. 7, 1952, ICAO Doc. 7634 [hereinafter Rome Convention].

[123] I.H.PH. DIEDERIKS-VERSCHOOR, AN INTRODUCTION TO SPACE LAW 40 (2d ed. Kluwer Law International, 1999).

iv. The *GPS-Galileo* Agreement and Liability

Finally, the *GPS-Galileo* Agreement's Article 19 governs State responsibility and liability for the purposes of that instrument. Art. 19's first clause notes that States will have responsibility for breaches of obligations under the Agreement, whereas the second clause governs instances in which it may be unclear whether an obligation is under the ambit of the EC or its Members States, requiring those entities to clarify questions about obligations proffered by the United States. Failure to provide this information upon request of the United States, or provision of contradictory information, results in joint and several liability between the EC and the Member States.

v. Liability Applied

To illustrate the above provisions, consider the example of a German State aircraft[124] carrying diplomats travelling from Berlin to Rome. En route, the aircraft is hit with debris from a defunct Canadian weather satellite that had begun re-entry into the atmosphere earlier in the day. After being hit by the debris, the aircraft is forced to make an emergency landing, whereupon the crew discovers that four passengers have been physically injured by the turbulence that resulted when the aircraft was hit, and one additional passenger appears to have suffered post-traumatic stress from what he believed was impending death. The aircraft itself was damaged to the tune of €3 million. A cursory application of the above treaty law would indicate that Germany would have recourse to the Outer Space Treaty regime to compensate the damaged parties. Indeed, the Outer Space Treaty's Article VII places international liability on Canada, while the Liability Convention provides specific guidance as to how to proceed, in addition to clarifying the concept of damage—thereby simplifying the task of compensation.

[124] For the purposes of simplification, a State aircraft not operating on the carriage of persons for reward, has been chosen to avoid the clutches of the Chicago Convention of 1944, as well as the Warsaw regime and the Montreal Convention of 1999.

As to the damage to the aircraft, Germany would request compensation under Art. II of the Liability Convention, noting that the damage caused to its plane was due to components of a space object harming the aircraft while it was in flight, thereby resulting in absolute liability. Canada would not have a defense to this compensation, unless it could exonerate itself under Article VI of the Liability Convention, and even then they could claim this only "to the extent that a launching State establishes that the damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State or of natural or juridical persons it represents." Thus, Canada would need to show Germany intentionally flew its aircraft into the falling debris, either to cause damage to its own aircraft, or perhaps in spite of dire and repeated warnings on the part of the launching State that the debris would be falling in the particular area of the aircraft's trajectory at the time of the accident.

Barring such an exoneration, the four physically injured passengers would be entitled to compensation as damaged persons (Art. I), and also under the absolute schema of Art. II. Whether the passenger who suffered mental 'damages' is entitled to recover is somewhat less obvious, although Art. I does include, within the definition of damage, "or other impairment to health," and this could very well include mental health.[125]

Insofar as Art. 19 of the *GPS-Galileo* Agreement is concerned, one might imagine a situation in which an aircraft operated by the United States is flying over some treacherous terrain in Northern Europe, depending on the provision of the joint *GPS-Galileo* signal input in its avionics. Assuming, *ad arguendo*, that the signal coming from the *Galileo* constellation had been 'unduly degraded' somehow, and assuming this loss of data caused the aircraft to veer off course and collide into rough

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[125] *Compare* case law in the United States that has precluded recovery for mental anguish or other mental health issues in aviation accidents, at least when these health problems lack a physical element; Burnett v. Trans World Airlines, 368 F. Supp. 1152 (D.N.Mex. 1973); Rosman v. Trans World Airlines, 314 N.E.2nd 848 (N.Y. 1974); Eastern Airlines v. Floyd, 499 U.S. 530, 111 S.Ct. 1489 (1991). *See generally* PAUL S. DEMPSEY & MICHAEL MILDE, INTERNATIONAL AIR CARRIER LIABILITY: THE MONTREAL CONVENTION OF 1999, ch. 7 (McGill University Centre for Research in Air & Space Law, 2005).

terrain, the United States would naturally request information about how this accident occurred. In so doing, a determination would need to be made as to which entity was responsible for the degradation or loss of signal—either the E.U., or one of its Member States. Failure to provide this information, or providing contradictory information would, as noted above, create a joint and several liability situation in Europe between the E.U. and the Member States.

While possible real-world liability situations would possibly be far more complex than the above example, the simplicity of the fiction should help evidence demonstrable application of international liability according to the space law treaty regime. With further clarification of the meaning behind certain provisions in the *GPS-Galileo* Agreement, that instrument could serve to refine the current regime and reify questions heretofore left to the abstractions of scholars. Without such an attempt, even the longstanding Outer Space Treaty regime may prove insufficient to ameliorate difficulties that could arise between the U.S. and E.U. when one or the other claims a breach of a poorly understood clause. The Parties should, therefor, endeavor to hasten discourse on the above mentioned ambiguous phraseology, not only for the prevention of damage to trade, commerce, safety of life, or efficient air transit, but also to avoid potentially devastating international liability.

vi. State Responsibility

Before delving into the world of domestic law, a brief foray into conceptions of State responsibility is warranted. This is due, in part, to the fact that responsibility is often the first step in the legal chain that leads to liability.[126] After all, if a State were not responsible for its acts, it could never truly be held liable for instances in which those acts violated international law. The discourse on what constitutes State responsibility, and how

[126] To be clear, state responsibility and liability are differing, if interrelated, concepts. Responsibility denotes something that shows a breach of an international obligation; whereas liability occurs once that first step has been satisfied, yet damage of some kind occurs.

it establishes relationships between States, was eventually written into the International Law Commission's Draft Articles on the Responsibility of States for Internationally Wrongful Acts.[127] The Draft Articles were commended to the States of the world by the United Nations General Assembly in Resolution 56/83 of 12 December 2001,[128] which "commended them to the attention of Governments without prejudice to the question of their future adoption."[129]

Article 1 of the Draft Articles establishes that "[e]very internationally wrongful act of a State entails the international responsibility of that State."[130] Article 2 further defines such acts as those that can be attributed to the State under international law, and that constitute a breach of an obligation. Thus, when a State is a Party to an international agreement, and especially a treaty, that State is internationally responsible for fulfilling its obligations, and if it breaches those obligations (e.g., with the *GPS-Galileo* Agreement, 'unduly disrupting or degrading signals'), then it has committed an internationally wrongful act—something each State would do well to avoid. There is a long tradition of States being held to account for internationally wrongful acts, and the International Court of Justice is often the arbiter of such cases and controversies.[131]

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[127] ILA, *Draft Articles on the Responsibility of States for Internationally Wrongful Acts*, http://untreaty.un.org/ilc/texts/instruments/english/draft%20articles/9_6_2001.pdf (last visited Nov. 28, 2012) [hereinafter Draft Articles].

[128] UN Resolution 56/83 of Dec. 12, 2001; The United Nations again commended the Articles to the States with UN Resolution 59/35 of Dec. 2, 2004.

[129] ILA, *State Responsibility*, http://untreaty.un.org/ilc/summaries/9_6.htm (last visited Nov. 28, 2012).

[130] Commentary on the Draft Articles indicates that Article 1 represents a strongly held conviction in international law. Indeed, "The principle that any conduct of a State which international law characterizes as a wrongful act entails the responsibility of that State in international law is one of the principles most strongly upheld by State practice and judicial decisions and most deeply rooted in the doctrine of international law." *Draft Articles on State Responsibility with Commentaries Thereto, Adopted by the International Law Commission on First Reading*, Part One, Origin of International Responsibility, ch.1, General Principles, Commentary, at art. 1(1), p. 1 (1997), http://untreaty.un.org/ilc/texts/instruments/english/commentaries/9_6_1996.pdf.

[131] *See generally* Case of the S.S. Wimbledon*,* P.C.I.J., Series A, No. l, at 15.; Case concerning the factory at Chorzdw (Jurisdiction), Judgment No. 8 of 26 July 1927, P.C.I.J., Series A, No.9, at 21 and *idem.* (Merits), Judgment No. 13 of 13 September 1927, P.C.I.J., Series A, No. 17, p. 29; Phosphates in Morocco case (Preliminary Objec-

This conception of international responsibility is echoed by the Outer Space Treaty's Article VI, which establishes that each State is internationally responsible for national activities in outer space, no matter if these activities are carried out by the government or non-governmental entities.[132] These space-based activities require the State Party to continue to authorize and supervise the actors in space. This Article, in conjunction with the rest of the space law treaty regime, establishes that the well-honed principle of international responsibility for wrongful acts is not restricted to terrestrial applications.

It is also important to remember that liability and responsibility are close cousins, but they are certainly not the same thing. Traditionally, liability carries with it a sense of damage, and responsibility a notion of ownership—not of property, but rather of an almost ethical ownership acknowledging that a State has a duty to do one thing or another. Some authors have suggested that many academics have overlooked the difference between the two concepts, and that even the International Law Commission has erred in creating a misconception about the terms.[133] Still, the terms share some meaning: "international liability is closely related to damage . . . damage however, although not an indispensable criterion for responsibility, is far from unimportant in that concept, and it is here that more confusion arises due to the resulting partial overlap with liability."[134] A further confusion can result when one considers the traditional role of international responsibility as a creature of States, whereas the Outer Space Treaty allowed, in Art. VI, for

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tions) 14 June 1938, P.C.I.J., Series A/B, No. 74, at 28; and Corfu Channel case (Merits), Judgment of 9 April 1949, I.CJ. Reports 1949, at 23.

[132] For an example of recent academic discourse on the nature of Article VI, *see generally* the 3rd Eilene M. Galloway Symposium on Critical Issues in Space Law, *Article VI of the Outer Space Treaty: Issues and Implementation* (Cosmos Club, Washington D.C., Dec. 11, 2008), http://www.spacelaw.olemiss.edu/events/notable/galloway.html [hereinafter Galloway Symposium].

[133] Frans G. von der Dunk, *Liability versus Responsibility in Space Law: Misconception or Misconstruction*?, *in* PROCEEDINGS OF THE THIRTY-FOURTH COLLOQUIUM ON THE LAW OF OUTER SPACE 363 (1991).

[134] *Id.* at 364.

the actions of non-State actors to be imputed unto those States.[135]

Whatever its complexities, it is obvious that "all rights of an international character involve international responsibility," an observation that harkens back to the ILC's definition of responsibility as being intimately related to breaches of obligations. In this way, an obligation of one State may be said to be the right of another—the crux of which entitles one State with a reasonable *expectation* that the obligation shall be upheld. Proceeding on this assumption, the State which is wronged by another's breach in obligation often suffers damages, and this, in turn, leads that State to claim reparation under whatsoever liability mechanisms are available. In instruments where the language may be unclear, the corresponding obligations may be encumbered with the same cloudy understanding of what obligations exist in the first place. Such is the trouble with the *GPS-Galileo* Agreement, and another reason why its provisions should be thoroughly sussed out before either Party comes to rely too heavily thereon.

B. U.S. Domestic Law

i. Background Law

Since most global navigation satellite services are provided by the U.S. *Global Positioning Service*, any liability stemming from the use of GNSS enhanced equipment is likely to attach itself to the provider of that service, i.e., the United States government. Especially in the arena of aviation, there is a strong tradition of injured passengers, or the families of passengers killed in aircraft accidents, being compensated for their damages. The private air law regime set up by the Warsaw Convention and its progeny, and the replacement treaty (for those States which have switched) of the Montreal Convention of 1999, have been addressing liability in this particular mode of transport for many decades. Transportation via satellite guid-

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[135] Ram Jakhu, *Implementation of Article VI of Outer Space Treaty in North America* (PowerPoint Presentation), Galloway Symposium, *supra* note 132.

ance, however, is comparatively quite new. As such, there is more uncertainty regarding the liability to be associated with GNSS. If the situation could be remedied with a readily available policy on *GPS* liability, passengers could rest more easily in the upcoming age of GNSS-guided take-offs, flight, and landings.

One primary difference between the current air traffic controlled aviation and *GPS*-guided aviation is that in the former system, the input of information to pilots and their craft is actively transmitted by other human actors, whereas *GPS*-guidance is a passive system that avoids direct involvement of the human element.[136] This factor may be applicable in any future court cases, for how can the provider of *GPS* be liable for aviation accidents if it is not actively controlling the path of the aircraft—the pilot is completing this task.

Either way, should a *GPS*-related accident occur, the logical party to sue would be the United States government. The U.S., however, believes that as a provider of a free service, civilians do not have a valid reason for suit when the service proves faulty,[137] and that in any event current mechanisms (read: Warsaw and M99 in the various States' court systems) are more than sufficient to handle any new instances resulting from the increased use of PNT services in air navigation.[138] From a common law perspective, one might argue that there has not been a contract formed between the users and provider of *GPS*—the one party provides a service to the other in the absence of any consideration for a contract. As such, there is no contractual ground on which the user may sue the provider; whether an argument from equity may proceed is another matter altogether. Additionally, it is doubtful whether such a contractual analysis would apply to civil law jurisdictions.

If a suit did proceed against the United States, it would have to do so under an exception to the well-established inter-

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[136] Paul Larsen, *Regulation of Global Navigation and Positioning Services in the United States*, *in* RAM JAKHU ED., NATIONAL REGULATION OF SPACE ACTIVITIES, ch. 20, 463 (Springer, 2010) [hereinafter *Regulation of Global Navigation*].

[137] LYALL, *supra* note 23, at 393.

[138] ICAO Doc. SSG-CSN/2-WP/6, 10.

national rule of sovereign immunity. Indeed, if the "King can do no Wrong," then he must allow himself to be sued if he is to be brought to his own courts at all. The concept of sovereignty itself is somewhat fluid, although it has taken on a certain legal solidity over time. Originally, States were not even the wielders of sovereignty,[139] though this has changed with time, as evidenced by Black's Law Dictionary, which defines sovereignty as "1. Supreme dominion, authority, or rule; 2. The Supreme political authority of an independent state; 3. The state itself."[140]

ii. The Federal Tort Claims Act

Thus, if one is to sue a sovereign State, it must do so under the curious instance of that State waiving its sovereign immunity. In the United States, such is the function facilitated by the Federal Tort Claims Act (FTCA).[141] The Congress provided that the government could be sued: "for injury or loss of property, or personal injury or death caused by the negligent or wrongful act or omission of any employee of the Government while acting within the scope of his office or employment, under circumstances where the United States, if a private person, would be liable to the claimant in accordance with the law of the place where the act or omission occurred."[142] This process can be is excepted when the government is acting under its discretionary authority[143]—an ill-defined term, to be sure.

In *Dalehite v. United States,*[144] the Supreme Court began to identify instances in which the government was performing a discretionary act and, consequently, was not liable under the FTCA. In *Dalehite*, the government had established a program

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[139] Jonathan F. Galloway, *Limits to Sovereignty: Antarctica Outer Space and the Sea Bed, in* PROCEEDINGS FORTY-FIRST COLLOQUIUM ON THE LAW OF OUTER SPACE, 81 (1998); for a fuller explanation about the evolution of sovereignty into the modern State-based doctrine, *see generally* Michael Dodge, *Sovereignty and the Delimitation of Airspace: A Philosophical and Historical Survey Supported by the Resources of the Andrew G. Haley Archive* 35:1 J. SPACE L. 5-35 (2009).

[140] BLACK'S LAW DICTIONARY, 8TH ED, S.V. sovereignty at 1430.

[141] 28 U.S.C. § 1346.

[142] *Id.* at (b)(1).

[143] 28 U.S.C. § 2680(a).

[144] Dalehite v. United States, 346 U.S. 15 (1953).

by which ammonium nitrate fertilizer had been stored in an effort to increase food production for areas under military occupation after World War II; unfortunately, this led to a disastrous explosion which resulted in a death.[145] In discussing the FTCA, the Court divined that the exception to liability included not only the establishment of programs, but also the decisions made by administrators "in establishing plans, specifications, or schedules of operations . . . it necessarily follows that acts of subordinates in carrying out the operations of government in accordance with official directions cannot be actionable. If it were not so, the protection of § 2680(a) would fail at the time it would be needed -- that is, when a subordinate performs or fails to perform a causal step."[146]

In *United States v. Union Trust*, the Court cited an instance in which the government was able to be sued. In this case, an air traffic controller cleared two different planes for landing at the same time and on the same runway, and that this is clearly an operational act—not a discretionary one.[147] Thus, with no defenses against it, the U.S. government was able to be sued under the provisions of the FTCA. Since GNSS so ably lends itself to the future of air traffic management, the question immediately presents itself: does reliance on GNSS allow aircraft owners and victims of airline crashes to claim compensation under the FTCA? Furthermore, when these aircraft begin relying on the combined might of *GPS* and *Galileo*, per the Agreement, which Party would be eligible for suit, if either? While decent interrogatories, the fact remains that a useful combination of the two constellations is still years to come, and up until then all is speculation rebuffed by the U.S. government claims that *GPS* is provided for free, and that it washes its hands of resultant liability. Furthermore, Larsen is skeptical that the current *GPS* system and its relationship to ATM is sufficiently

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[145] *Id.* at Syllabus.

[146] *Dalehite*, *supra* note 144, at 36.

[147] United States v. Union Trust, 350 U.S. 907 (1955), *cited in* LYALL, *supra* note 23, at 464; for more information on the government's negligence and the concept of compensation, *see The Federal Employees' Compensation Act: Effect of Government's Negligence on Reimbursement*, 1961 DUKE L. J. 160-166 (Winter, 1961), *available at* http://www.jstor.org/stable/1370993.

analogous to current management systems to warrant treatment under the FTCA similar to that of *Union Trust*-like situations.[148] The truth may have to wait for an edifying, if altogether undesirable, disaster to occur in an aircraft depending on proper *GPS* guidance to land, take-off, or fly.

Adding to the limitations of the FTCA, in incidents outside the jurisdictional scope of the United States' territory, victims of a *GPS*-based accident could not hope to sue even if that *GPS* service were considered an operational activity.[149] Thus, plaintiffs may be forced to find alternative means of compensation. One such arena would be to sue the manufacturer of the satellite, especially if it can be shown the fault which led to the incident was due to a flaw in the satellite, or in its design. As these manufacturers are not government entities in the United States, they cannot—technically—shield themselves with sovereign immunity. They may be able to claim a measure of protection in certain instances, particularly when the manufacturer is simply complying with specifications provided by the government.

In *Boyle v. United Technologies*, the Supreme Court noted that "[w]e agree [that]… liability for design defects in military equipment cannot be imposed, pursuant to state law, when (1) the United States approved reasonably precise specifications; (2) the equipment conformed to those specifications; and (3) the supplier warned the United States about the dangers in the use of the equipment that were known to the supplier but not to the United States."[150] Whether this exemption from the FTCA is specifically restricted to military equipment is, with respect to the U.S. military asset *GPS*, irrelevant.

iii. E.U. Law

Liability in the European Union is governed by several instruments, but it is unclear to what extent the E.U. would be

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[148] *Regulation of Global Navigation*, *supra* note 136, at 464.

[149] 28 U.S. 2680(k). An exception to the FTCA occurs when the accident occurs as "any claim arising in a foreign country."; *See* Smith v. United States, 507 U.S. 197 (1993), in which a claim arising in Antarctica was barred.

[150] Boyle v. United Technologies, 487 U.S. 500, 512 (1988).

liable in the event of accidents involving reliance on the *Galileo* constellation, or with incidents involving the joint *GPS-Galileo* efforts. While the European Space Agency has made clear the importance of *Galileo* to the future of Europe, it is protected from almost all forms of liability.[151] Annex I of the Convention provides exceptions to this exception in instances where the Council waves immunity, or where "reliance upon it would impede the course of justice and it can be waived without prejudicing the interests of the Agency."[152] The ESA may also be liable in instances where their activities that rely on *Galileo* are explicitly for commercial purposes,[153] and, given their insistence on how much commerce and revenue *Galileo* is predicted to bring to Europe, this may be more often than with which the Agency would be comfortable.

The Treaty of Amsterdam's Article 288 notes that "the Community shall, in accordance with the general principles common to the laws of the Member States, make good any damage caused by its institutions or by its servants in the performance of their duties."[154] Since the E.U. is party to the *GPS-Galileo* Agreement, they may find this article forces compensation for accidents involving *Galileo* or any *GPS-Galileo* cooperation, although this remains to be litigated.

Finally, as one of the primary functions of *Galileo* is to improve aviation travel, Eurocontrol is, of necessity, implicated in potential problems with the *GPS-Galileo* Agreement. The Eurocontrol Convention provides that liability for that agency is governed by the law of the concerned contract, and that in instances of non-contractual liability "the Organisation shall make reparation for damage caused by the negligence of its or-

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[151] Convention for the Establishment of a European Space Agency, art. XV(2), ESA SP-1271(E) (2003), http://esamultimedia.esa.int/docs/SP1271En_final.pdf ("The Agency, its staff members and experts, and the representatives of its Member States, shall enjoy the legal capacity, privileges and immunities provided for in Annex I.").

[152] *Id.* at Annex I, art. IV(1)(a).

[153] *See* Jaugey, *supra* note 11, at 66.

[154] Treaty of Amsterdam Amending the Treaty on European Union, The Treaties Establishing the European Communities and Related Acts, art. 288 (ex. art. 215), Oct. 2, 1997, *available at* http://eur-lex.europa.eu/en/treaties/dat/11997D/htm/11997D.html.

gans, or of its servants in the scope of their employment, in so far as that damage can be attributed to them."[155]

iv. Future Law

With the future of liability tentative and illusory, one wonders if another path could be crafted to head off potential problems before they are created. Along these lines, future research should ask if there is there a jurisprudential duty, international or domestic, for the major GNSS providers to change their restrictive and protectionist stances on liability for system failures. Would voluntarily adopting such an international duty place undue restraints on the proper powers of State sovereignty? Could the U.S. president and Congress alter domestic legal policy and demonstrate a new commitment to multinationalism in keeping with the European Union's belief, after the election of President Obama, in an unprecedented era of international cooperation?[156] Certainly, while his priority is his own State, the President could go far in alleviating uncertainties in the future of GNSS by committing the United States to talks, for example, concerning a new agreement between the U.S. and Europe that would comprehensively remedy questions about liability, compatibility between systems, new air traffic management systems, and ambiguous language in the currently operating *GPS-Galileo* Agreement.

Some argue that any new agreement on GNSS liability is unnecessary.[157] After all, such an agreement is not needed for

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[155] Protocol consolidating the Eurocontrol International Convention relating to Cooperation for the Safety of Air Navigation of 13 December 1960, as variously amended, Consolidated Version Which Incorporates the Texts Remaining in Force of the Existing Convention and the Amendments Made by the Diplomatic Congress of 27 June 1997, Consolidated Text of the Enacting Terms of the Convention, art. 28, (2002), *available at* www.pca-cpa.org/showfile.asp?fil_id=238; for a fuller accounting of European liability law and GNSS, *see* Rodriguez-Contreras Pérez , *supra* note 4.

[156] Bruno Waterfield, *European Union: Barack Obama "will bring new era of international co-operation",* THE TELEGRAPH (Nov. 5, 2008), http://www.telegraph.co.uk/news/worldnews/barackobama/3385456/European-Union-Barack-Obama-will-bring-new-era-of-international-co-operation.html.

[157] Jaugey, *supra* note 11, at 76.

the continued provision of GNSS,[158] though it could nevertheless be desirable. While a new agreement might go far in cementing understanding of various States' obligations towards one another (and increase confidence in future air traffic management systems),[159] it could also create new problems, and any elimination in ambiguity regarding a State's obligations towards another could be seen as an imposition on sovereignty—something any State is loath to allow. Following this mentality, it seems provider States desire a future agreement on liability much less than developing States, possibly because the latter have much less to lose in such a convention.[160] Indeed, one notable suggestion for creating an international GNSS liability convention is that all claims could be brought to a single jurisdiction, rather than those of individual provider States or entities[161]—the United States would likely see such a move, forcing legal decisions regarding its own GNSS system out of the hands of its own courts, as an unacceptable imposition on its sovereignty.

This author would recommend that the current U.S. President, as well as current leaders in the European Union, such as the President of the European Commission, should set up mirroring commissions that examine the possibility of a future agreement, assessing both the positive and negative aspects of any such future instrument. If both sides determine the idea is worth discussing on an international scale, then they could begin the diplomatic dance that could create this future agreement. If States do nothing, they ought to hope their obligations

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[158] *See* Francis P. Schubert, *An International Convention on GNSS Liability: When Does Desirable Become Necessary?*, XXIV Annals of Air & Space L. 1 (1999); *see also* memorandum from Francis P. Schubert on Global Navigation Satellite Systems (2004); and ICAO, *Report on the Establishment of a Legal Framework with Regard to CNS/ATM System Including GNSS*, ICAO Doc. A35-WP/75 (2004).

[159] Hon. K.O. Rattray, QC, *Legal and Institutional Challenges for GNSS, the Need for Fundamental Obligatory Norms* (paper presented to the World-wide CNS/ATM Conference in Rio de Janeiro, May 1998); *see also* Air Safety Week, *National Interests Collide at Global Navigation and Airspace Management Conference*, (June 8, 1998), *available at* http://findarticles.com/p/articles/mi_m0UBT/is_23_12/ai_50058817/.

[160] Jaugey, *supra* note 11, at 76-77.

[161] ICAO, *Proposal by Certain Members of the Study Group Relating to Main Elements of an International Convention*, ICAO Doc. A35-WP/75 Appendix Attachment H (2004).

appear clear enough when the time comes to implement them, and when disagreements start to arise.

III. CONCLUSION

Global Navigation Satellite Systems are a key technology in the modern age, and their use and integration into daily life continues to grow. Many millions of individual users exist, utilizing *GPS* or *GLONASS* to do everything from navigate automobiles, pilot sea vessels, synchronize laboratory experiments with highly accurate atomic clocks, and find one's position on the surface of the Earth. Realizing its potential, perspicacious policy makers dreamt up a future in which GNSS could be used to improve aviation navigation, allowing greater efficiency in transit by decreasing the needed separation between aircraft, enabling swifter and more accurate takeoffs and landings, and correct directionality whilst in the air.

The 2004 *GPS-Galileo* Agreement, signed between the United States and the (then) European Community serves as an example of current GNSS law and policy, and demonstrates that both the United States and the European Union have an interest in making the future *Galileo* GNSS compatible with the *GPS* system, both in terms of general signal redundancy, and also in creating new safety-of-life applications that should increase response times in emergencies and natural disasters. The fact that several joint-statements and working group reports have been released ever since the signing the Agreement is encouraging, and suggestive that both Parties are interested in continuing their peaceful and productive cooperation towards creating a truly global navigation satellite system, the continued independence of each system notwithstanding. Several problems with language in the Agreement have been revealed, most especially language involving the promise that neither party will unduly degrade or disrupt the PNT signals they provide—an obligation that leaves much to interpretation, and opens the possibility to confusion both in operations performed by policy makers, and in the end-users so heavily dependent on GNSS for their everyday needs, whether commercial, scientific, or recreational.

That many billions of dollars and euros, as well as continued international good-will, ride on amenable interpretation of this and other ambiguous language suggests that States should endeavor to clarify their obligations towards one another under this Agreement. Whether this task will be fulfilled in a future agreement or treaty is unknown, but end-users, investors, and corporations alike, along with States across the globe, would be well-served if this problem could come to a quick, yet thorough, conclusion. The issue of liability may remain a sticking point for any such deal, and would especially be so for the GNSS providers; however, this should not negate their responsibility to ensure the safest and most consistent application of their technology to GNSS users.

This article intended to provide a survey of the current GNSS law and policy throughout the world, and in particular in the U.S. and E.U. The history of codification in the U.S., and the varied uses to which this technology (originally intended as a military asset) has spread were relayed to provide a basis for understanding the massive international commercial and navigational reliance on GNSS technology. Additionally, the example of the *GPS-Galileo* Agreement, it is hoped, served to demonstrate the intricacies of international legal relations, as well as the inherent difficulties in analyzing and interpreting the meaning of language. These problems notwithstanding, efforts by both Parties could clarify ambiguities before problems arise, and the author of this article is hopeful these discussions will be effectuated in the near future.

SMALL SATELLITES AND SMALL STATES: NEW INCENTIVES FOR NATIONAL SPACE LEGISLATION

Irmgard Marboe
and Karin Traunmüller[*]

I. INTRODUCTION

The development of low-cost satellite missions has made space activities increasingly accessible in past years. Such missions include the development, launch, and operation of mini satellites, micro satellites, nano satellites, pico satellites, and even femto satellites.[1] Standardized nano satellites in the shape of a small cube are referred to as "CubeSats."[2] The United Nations has recently initiated the Basic Space Technology Initiative (BSTI) in the framework of the United Nations Programme on Space Applications in an effort to support capacity building in basic space technology and to promote the use of space technology and its applications for sustainable development.[3] Together with the European Space Agency and the government of

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[1] Although there is no internationally recognized definition of small satellites, they are typically categorized according to their mass. Mini satellites have less than 500 kilograms, micro satellites less than 100 kilograms, nano satellites less than 10 kilograms, pico satellites less than 1 kilograms, and femto satellites less than 100 grams. *See, e.g., Satellite Classification*, SMALL SATELLITE HOME PAGE, http://www.centaur.sstl.co.uk/SSHP/sshp_classify.html (last visited Feb. 28, 2013). Mini satellites are sometimes categorized as satellites with a mass less than 1000 kilogram. *See* Rainer Sandau, *International Study on Cost-Effective Earth Observation Missions Outcomes and Visions*, 36 INT'L SOC'Y PHOTOGRAMMETRY REMOTE SENSING COMMISSION SYMP. pt. 1, *available at* http://www.isprs.org/proceedings/XXXVI/part1/Papers/T04-15.pdf (last visited Feb. 28, 2013).

[2] Paul Muri & Janise McNair, *A Survey of Communication Sub-systems for Intersatellite Linked Systems and CubeSat Missions*, 7 J. OF COMM. 290, 295 (2012).

[3] The first symposium was held from September 8-11, 2009 and the second symposium from September 21-13, 2010. *See UN/Austria/ESA Symposium 2009-2011*, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS, http://www.unoosa.org/oosa/SAP/act2011/graz/index.html (last visited Feb. 28, 2013).

Austria, the United Nations organized several symposia dedicated to the topic of "Small Satellite Programmes for Sustainable Development."[4] The European Union is supporting an international network of 50 CubeSats to be launched together from Murmansk in northern Russia under its Seventh Framework Program (FP7).[5]

The advantages of small satellites are manifold. More and more capable nano- and small satellites can be developed with an infrastructure and at a cost that make them feasible and affordable for organizations such as academic institutions and research centers, which have a limited budget for space activities.[6] Small satellites create new opportunities for developing countries and countries that had previously only been users of space applications and make the involvement of local and small industry possible. Small satellites can lead to State independence in space by increasing the State's capability to engage in Earth observation without relying on input from major spacefaring nations.[7]

However, due to their size and low cost, small satellites usually lack onboard propellant systems and are thus not maneuverable. Once they are deployed in an orbit they cannot change their position. This causes serious concerns relating to collisions with other space objects, even though no such inci-

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[4] United Nations/Austria/European Space Agency Symposium on Small Satellite Programmes for Sustainable Development, Graz, Austria, Sept. 13-16, 2011, *Implementing Small Satellite Programmes: Technical, Managerial, Regulatory and Legal Issues,* U.N. Doc. A/AC.105/1005 (Nov. 28 2011).

[5] QB50, https://www.qb50.eu/index.php/project-description (last visited Feb. 28, 2013). FP is the multi-annual research program of the European Union administered by the European Commission in the years 2007 to 2013. *See* Regulation (EC) No 1906/2006 of the European Parliament and of the Council of 18 December 2006 laying down the rules for the participation of undertakings, research centres and universities in actions under the Seventh Framework Programme and for the dissemination of research results (2007-2013), OJ L 391/1.

[6] *UN/Austria/ESA Symposium 2009-2011*, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS, http://www.unoosa.org/oosa/SAP/act2011/graz/index.html (last visited Feb. 28, 2013) at 2.

[7] Rainer Sandau, Int'l Acad. of Astronautics, Presentation at the Fourth African Leadership Conference on Space Science and Technology for Sustainable Development, *Small Satellites for Capacity Building in Space Technology Development* 6 (Sept. 26 2011), http://www.oosa.unvienna.org/pdf/bst/ALC2010/02_Sandau_ALC-Mombasa.pdf.

dents have been reported to far.[8] Thus, the increased interest in small satellites also creates a number of legal issues. It is an open question how to ensure that small satellite activities do not interfere with or compromise the safety of other space systems or that they do not contribute to the creation of new space debris.[9] This question not only concerns the traditional space faring nations, but also other States which may find themselves confronted with space activities being planned and carried out on their territory or by their nationals. These States may be responsible or liable for those activities under international law, even without governmental support or knowledge, because of the pertinent provisions in the UN treaties on outer space or under customary international law.[10]

Consequently, when the development of small satellite programs materializes, States should consider if the existing national legal framework is sufficient. They should ensure that the positive effect of small satellites would not be nullified by its negative effect on the safety and the long-term sustainability of space activities at large. While supporting small satellite programs, States should also be aware of the risks connected to such activities.

This article will discuss how the elaboration of national space legislation in Austria, Belgium, and The Netherlands, three States that have enacted national space legislation recently, has been affected by the possibility of future small satellite programs and which approach these States have taken to regulate them.

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[8] Neta Palkovitz & Tanja Masson-Zwaan, *Orbiting under the Radar: Nanosatellites, International Obligations and National Space Laws*, *in* PROC. OF THE 54TH IISL COLLOQUIUM ON THE LAW OF OUTER SPACE (forthcoming, 2012) [hereinadter *Orbiting under the Radar*].

[9] Werner Balogh, *The Role of Binding and Non-binding Norms in the Implementation of Small Satellite Programmes*, *in* SOFT LAW IN OUTER SPACE 325, 329 (Irmgard Marboe ed., Böhlau 2012).

[10] *See generally,* Karl Zemanek, *The United Nations and the Law of Outer Space*, 19 Y.B. WORLD AFF. 199 (1965) (for a discussion of the binding character, under international law, of the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, G.A. Res. 1962 (XVIII), U.N. GAOR, 18th Sess., 1280th plen. mtg., U.N. Doc. A/RES/1962(XVIII) (Dec. 13, 1963)).

II. THE NEED FOR NATIONAL LEGISLATION

A. Austria

Since 1987, when Austria joined the European Space Agency (ESA), it has developed a sizable space community, consisting of a number of research institutes and commercial enterprises, which contribute to numerous ESA projects.[11] However, the first independent space activity started in 2006 with the initiative of the Technical University of Graz to build the first Austrian nano-satellite (20x20x20 centimeters cm in size, approximately 8 kilograms in weight). It was developed in close cooperation with the Technical University of Vienna, the University of Vienna, and the Institute for Aerospace Studies (UTIAS) at the University of Toronto.[12] The Austrian Ministry for Transport, Innovation and Technology financially supported the program through the Austrian Space Application Program (ASAP) of the Austrian Research Promotion Agency (Österreichische Forschungsförderungsgesellschaft (FFG)) under the supervision of its Aeronautics and Space Agency (ALR).[13] The scientific goal of the program is the investigation of the brightness oscillations of massive luminous stars by differential photometry.

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[11] *See generally Partner in der Raumfahrt in Österreich*, EUROPEAN SPACE AGENCY, http://www.esa.int/esaCP/ESAUOVK30JC_Austria_0.html (last update Nov. 24, 2011). Austria's involvement in ESA activities includes participation in both mandatory and optional programs. *Austria in Space*, THE AUSTRIAN RESEARCH PROMOTION AGENCY, http://www.ffg.at/en/space/austria-in-space (last visited Feb. 28, 2013). The ESA mandatory program includes general activities, the space science programme and the technology programmes, the study programmes, and research grants. *Id.* As regards ESA optional programs, Austria participates in applied space research and technologies, in activities related to the European launcher Ariane but not in the International Space Station. . *Id.* In addition, in 1991, a major Austrian space activity was the bilateral cooperation project, AustroMir, which brought the first Austrian astronaut, Franz Viehböck, to the Russian space station *Mir*. *See* BRUNO BESSER, AUSTRIA'S HISTORY IN SPACE 39 (R. A. Harris ed., 2004), http://www.ffg.at/sites/default/files/downloads/page/austriashistoryinspace1.pdf.

[12] *See Partner*, THE TUGSAT-1/BRITE-AUSTRIA PROJECT, http://www.tugsat.tugraz.at/projekt/partner (last visited Feb. 28, 2013).

[13] *See generally Aeronautics and Space Agency*, THE AUSTRIAN RESEARCH PROMOTION AGENCY, http://www.ffg.at/en/space/alr (last visited Feb. 28, 2013).

In addition, the University of Vienna decided to purchase a more or less identical satellite "in orbit" directly from the University of Toronto.[14] Unlike the University of Graz project, the University of Vienna is mainly interested in the data which can be obtained by the satellite and not by the construction of the satellite as such.[15] The project was initiated and financed by the University of Vienna under its ordinary budget, and not by the ASAP. In fact, for a number of years the competent Austrian authorities were not even aware of the purchasing contract.

The two satellites were launched by the same launcher from a Polar Satellite Launch Vehicle (PSLV) from India and to be put into the Low-Earth Orbit (600-900 kilometers) in February 2013.[16] The satellites are part of an interdisciplinary and inter-university research and educational program named BRITE (Bright Target Explorer),[17] the long term goal of which is to develop a generic satellite platform to be used for future low-cost space missions.[18]

The development of the first Austrian small satellite programs raised the question if there was a need for action on the national level with regard to its obligations under international law. Austria has ratified all of the five UN treaties on outer

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[14] Irmgard Marboe, *The New Austrian Outer Space Act*, 61 ZEITSCHRIFT FÜR LUFT- UND WELTRAUMRECHT 26, 28 (2012). See also the "General Part" of the "Materials" to the Austrian Outer Space Act at the website of the Austrian parliament, http://www.parlament.gv.at/PAKT/VHG/XXIV/I/I_01466/fname_232781.pdf; it was only by coincidence that the Austrian Federal Ministry for Transportation, Innovation and Technology, the ALR and the FFG became aware of the project in 2009.

[15] *The New Austrian Outer Space Act*, *supra* note 14, at 26, 28.

[16] William Graham, *Indian PSLV successfully lofts multiple satellites*, NASA SPACEFLIGHT.COM (Feb. 25, 2013), http://www.nasaspaceflight.com/2013/02/pslv-launch-multi-sats/. This was the result of a multi-annual decision making process during which also Russian launch vehicles, such as Dnepr, Sojus, Rockot or Cosmos, and the Ariane V have been considered. *See* Levtchev, *infra* note 17 at 26, 49, 54.

[17] The instruments aboard cover two different optical spectra which improves the quality of the expected pictures. Boris Levtchev, *Brite Austria Mission TUGSAT-1 and Uni BRITE*, *in* VON LISSABON ZUM RAUMFAHRTZEUG: AKTUELLE HERAUSFORDERUNGEN IM VÖLKERRECHT [LISBON TO THE SPACECRAFT: CURRENT CHALLENGES IN INTERNATIONAL LAW] 49, 52 (Sigmar Stadlmeier ed., Vienna 2011) 49, 52. *See* BRITE – CONSTELLATION, http://www.brite-constellation.at (last visited Feb. 28, 2013).

[18] *Mission,* THE TUGSAT-1/BRITE-AUSTRIA PROJECT, http://www.tugsat.at/project/mission (last visited Feb. 28, 2013).

space.[19] However, legislative action had not been considered necessary so far, as Austria's space activities had been carried out in international cooperation and under non-Austrian leadership, most importantly in the framework of ESA. As ESA, on its own behalf, had accepted the obligations contained in the Rescue and Return Agreement, the Liability Convention, and the Registration Convention, Austria had not seen a need for specific legislation at the national level.[20]

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[19] 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* Jan. 27, 1967, 18 U.S.T. 2410, 610 U.N.T.S. 205 [hereinafter Outer Space Treaty] (Austria ratified the Outer Space Treaty on February 26, 1968, *see* Austrian Federal Law Gazette No. 103/1968); Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space, *opened for signature* Apr. 22, 1968, 19 U.S.T. 7570, 672 U.N.T.S. 119 [hereinafter Rescue and Return Agreement] (Austria ratified the Rescue and Return Agreement on February 19, 1970, *see* Austrian Federal Law Gazette No. No. 110/1970); the Convention on International Liability for Damage Caused by Space Objects, *opened for signature* Mar. 29 1972, 24 U.S.T. 2389, 961 U.N.T.S. 187 [hereinafter Liability Convention] (Austria ratified the Liability Convention on January 10, 1980, *see* Austrian Federal Law Gazette No. 162/1980); the Convention on Registration of Objects Launched into Outer Space, *opened for signature* Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15 [hereinafter Registration Convention] (Austria ratified the Registration Convention on March 6, 1980, *see* Austrian Federal Law Gazette No 163/1980); and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, *opened for signature* Dec. 18, 1979, 1363 U.N.T.S. 21 [hereinafter Moon Agreement] (Austria ratified the Moon Agreement on June 11, 1984, *see* Austrian Federal Law Gazette No. 286/1984).

[20] ESA made the declarations under Article 6 of the Rescue and Return Agreement, *supra* note 19; Article VII of the Registration Convention, *supra* note 19; and Article XXII of the Liability Convention, *supra* note 19, which stipulate the possibility of international organizations to declare their acceptance of the rights and obligations provided in those treaties. In that case, references to States shall be deemed to apply to it. *See* Office for Outer Space Affairs, *Status of International Agreements Relating to Activities in Outer Space as of 1 January 2010*, U.N. Doc. ST/SPACE/11/Rev.2/Add.3 (Jan. 1 2010), *available at* http://www.unoosa.org/pdf/publications/ST_SPACE_11_Rev2_Add3E.pdf. The position of the Austrian institutions in this respect is evidenced in the "Materials" which accompany the text of the new Austrian law. *See* "Materials" to the Austrian Outer Space Act, *supra* note 14. This position is, however, not shared by all other States. Belgium is an example of a different view. *See* Michael Gerhard, *Article VI*, *in* 1 COLOGNE COMMENTARY ON SPACE LAW 103, 122-123 (Stephen Hobe et al. eds., 2009). One might also ask, if the project AustroMir of 1991, *supra* note 11, had not also already required national space legislation. In regards to the European perspective of national space legislation, *see* Irmgard Marboe, *National Space Legislation: The European Perspective*, *in* NATIONALES WELTRAUMRECHT/ NATIONAL SPACE LAW DEVELOPMENT IN EUROPE – CHALLENGES FOR SMALL COUNTRIES 31 (Christian Brünner & Edith Walter eds., 2008).

From the beginning of the elaboration of the Outer Space Act, the issue of registration was raised. The authorities were aware of the international register of space objects kept by UNOOSA on behalf of the UN Secretary General, and of the need for a national registry. However, there was no such registry in Austria.

Subsequently, it turned out that not only the issue of registration had to be addressed but that also other issues, most importantly in connection with liability, were unsolved. It became evident that Austria could become liable for damage caused by the small satellites without having any influence or control on them. If the government had to pay compensation for such damage, it would not have a right of recourse against the operator. Therefore, the Federal Ministry for Transport, Innovation and Technology came to the conclusion that a comprehensive regulation of space activities carried out on Austrian territory or by Austrian nationals was needed.[21] It decided to propose to the Austrian parliament – as promptly as possible – a draft for an act on outer space.

In early 2009, the first draft was circulated[22] and after two and a half years of negotiations, which involved a considerable

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[21] The competence of the Federal Ministry for Transport, Innovation and Technology derives from the competence to regulate "the traffic system relating to the railways, aviation and shipping . . . ." BUNDES-VERFASSUNGSGESETZ [B-VG][CONSTITUTION] BGBl. No. 1/1930, as last amended by Bundesverfassungsgesetz [BVG] BGBl I No. 98/2010, art. 10(¶1)(9) (Austria). *See also* Sigmar Stadlmeier, *Ein österreichisches Weltraumgesetz* [*An Austrian Space Law*], *in* VON LISSABON ZUM RAUMFAHRTZEUG: AKTUELLE HERAUSFORDERUNGEN IM VÖLKERRECHT [LISBON TO THE SPACECRAFT: CURRENT CHALLENGES IN INTERNATIONAL LAW] 33 (Sigmar Stadlmeier ed., Vienna 2011); Sigmar Stadlmeier, *What's in a Register: Austria (not) Doing Her Homework?*, *in* NATIONALES WELTRAUMRECHT/ NATIONAL SPACE LAW DEVELOPMENT IN EUROPE – CHALLENGES FOR SMALL COUNTRIES 148, 149-150 (Christian Brünner & Edith Walter eds., Vienna 2008); Edith Walter, *The Constitutional Basis for an Austrian Space Law*, *in* NATIONALES WELTRAUMRECHT/ NATIONAL SPACE LAW DEVELOPMENT IN EUROPE – CHALLENGES FOR SMALL COUNTRIES 157, 162 (Christian Brünner & Edith Walter eds., Vienna 2008); Franz Koppensteiner, *Ein kleiner Schritt für die Menschheit, ein großer für Österreich?*[*One small step for mankind, one giant leap for Austria?*], *in* ÖFFENTLICHES RECHT [PUBLIC LAW] 11, 14-15 (Georg Lienbacher & Gerhart Wielinger eds., 2011).

[22] The ministry had entrusted the Austrian National Point of Contact for Space Law (NPOC) of the European Centre for Space Law (ECSL) with the first draft. Prof. Christian Brünner at the University of Graz founded the Austrian NPOC in 2001. *See* BESSER, *supra* note 8, at 15. In late 2008, it moved to the University of Vienna.

number of ministries, the final text was accepted by the Council of Ministers on October 11, 2011. This proposal was presented to the Parliamentary Committee for Research, Technology and Innovation where it was endorsed unanimously on December 1, 2011. The Act was adopted unanimously on December 6, 2011 by the National Council and on December 15, 2011 by the Federal Council.[23].

After the vote at the National Council, the Minister for Transport, Innovation and Technology reiterated that the main reason for the new act was the launch of the two small satellites developed by universities in Graz and Vienna. Despite the fact that the launch would take place from India, Austria would become a "launching State" and, as such, it had to implement the space treaties it had ratified. The new act would now provide for the risk of damage and pertinent liability.[24]

A few members of parliament also raised their voices in favor of the new act. Some emphasized the importance of the law for the Austrian research community.[25] Others pointed out that Austria had accepted international obligations by ratifying the Outer Space Treaty in 1967 and that the new act ensured that these obligations could be complied with.[26] Some emphasized the importance of the space register and the peaceful uses of outer space,[27] while others noted the need for authorization procedures, liability provisions, and provisions on the mitigation of space debris.[28] One Member of Parliament opined that the draft

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[23] BUNDESGESETZ ÜBER DIE GENEHMIGUNG VON WELTRAUMAKTIVITÄTEN UND DIE EINRICHTUNG EINES WELTRAUMREGISTERS (WELTRAUMGESETZ) BUNDESGESETZBLATT [BGBL I] No. 132/2011 (Austria), *translated in Austrian Federal Law on the Authorisation of Space Activities and the Establishment of a National Space Registry*, UNITED NATIONS OFFICE FOR OUTER SPACE AFFAIRS, http://www.oosa.unvienna.org/pdf/spacelaw/national/austria/austrian-outer-space-actE.pdf (last visited Feb.28, 2013) [hereinafter Austrian Outer Space Act]. *See also Weltraumgesetz*, REPUBLIK ÖSTERREICH PARLAMENT, http://www.parlament.gv.at/PAKT/VHG/XXIV/I/I_01466/index.shtml (last visited Feb. 28, 2013).

[24] Press Release, Minister Doris Bures, Bahnnetze – Einheitlichere Vorschriften für Bessere Verbindungen. Österreich hat nun auch ein Weltraumgesetz [Rail networks - More uniform rules for better connections. Austria now also has an Outer Space Act] (Dec. 6 2011), http://www.parlament.gv.at/PAKT/PR/JAHR_2011/PK1198/.

[25] *Id.* at MP Kurt Gartlehner' statement.

[26] *Id.* at MP Johannes Schmuckenschlager's statement.

[27] *Id.* at MP Gerhard Deimek's statement.

[28] *Id.* at MP Albert Steinhauser's statement.

was not spectacular but necessary in view of the envisaged launch of the two Austrian research satellites.[29] All of the members of parliament that took the floor voiced their support of the new act and emphasized that space research and technology was a growing industry. However, it was also stated that Austria still had development potential in this area and that the two small satellites did not signify that Austria was on its way to becoming a space power.[30]

B. Belgium

Belgium has been engaged in international space cooperation since almost the beginning of the space age. It was actively involved in the European Space Research Organization (ESRO) that later became ESA.[31] Belgium hosts one of the stations in Redu, in the Ardennes region of Southern Belgium. With about ninety percent of the federal space budget used to fund programmes run by ESA, Belgium is the fifth largest contributor to the organization. Thanks to its diversified industry, Belgium is able to participate in all fields of space research and applications.[32] The main efforts of Belgian space activities are situated in the fields of Technology (TEC), Launchers (LAU), Telecom

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[29] *Id.* at MP Rainer Widmann's statement.

[30] *Id.* at MP Rainer Widmann & MP Bernd Schönegger's statements.

[31] One of the first activities in which Belgium was directly involved was the establishment of a station for the European Space Tracking (ESTRACK) network, operated by the European Space Operations Centre (ESOC) for ESA. *See* DAWINKA LAUREYS, BELGIUM'S PARTICIPATION IN THE EUROPEAN SPACE ADVENTURE 3 (R.A. Harris ed., 2003).

[32] Jean-François Mayence, *The Belgian Law on the Activities of Launching, Operating and Monitoring of Space Objects*, VIIITH EUROPEAN INTERPARLIAMENTARY SPACE CONFERENCE 3 (2006), *available at* http://www.belspo.be/belspo/eisc/pdf/docu1law/Mayence.pdf (last visited Feb. 28, 2013) [hereinafter The Belgian Space Law]. Currently, the Belgian space sector involves some seventy teams in federal or regional scientific establishments or research centres of excellence, as well as around forty companies and almost 1,600 direct jobs for highly qualified people. *See Space Cooperation*, KINGDOM OF BELGIUM, http://diplomatie.belgium.be/en/policy/policy_areas/striving_for_global_solidarity/space_cooperation/ (last visited Feb. 28, 2013). More than forty manufacturers are regularly active in the space sector. *See The Belgian Space Industry*, BELGIAN SCI. POL'Y OFFICE, http://www.belspo.be/belspo/space/beIndu_en.stm (last visited Feb. 28, 2013).

and Integrated Applications (TIA), and Human Space Flight (HSF).[33]

Like the majority of States, Belgium witnessed the growth of commercial activity during the past years. The Vitrociset Company, based in Redu, operated orbital manoevres on foreign satellites.[34] Although the company's premises are situated on the ESA Redu Ground Station, its activities not covered by the ESA Convention, still fell under Belgian jurisdiction.[35] Two specific characteristics of Belgium encourage an intense concentration of space industry and operators: first, the fact that Belgium hosts the majority of EU institutions and, second, the particularities of the Belgium fiscal system.[36]

As with many other countries, the operation of small satellites by commercial organizations and academic institutions will increase in the next decades due to their affordability. A number of Belgian companies have the capability to develop and are developing small satellites. For instance, Spacebel is a software engineering company operating in the Space and Earth monitoring application sectors and serving space agencies, major aerospace prime companies, EU institutions, as well as the commercial market.[37] Another Belgian company, Verhaert Design and Development NV has been developing advanced small space systems like small satellites for the past 30 years.[38]

Belgium has ratified all five United Nations space law treaties as well as the conventions of EUMETSAT, ECMWF, ESO, EUTELSAT. It has further concluded several bilateral coopera-

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[33] Maarten Adriaensen & Philippe Erhard, *Space Activities and Governance and the Role of Regional Authorities: Belgium Case Study*, 57 EURO. SPACE POL'Y INST. PERSPECTIVES 1, 2 (2012).

[34] Jean-François Mayence, *Introduction* to *Belgian Law on the Activities of Launching, Flight Operations or Guidance of Space Objects*, *in* 5 SPACE LAW: BASIC LEGAL DOCUMENTS E.X (Karl-Heinz Böckstiegel et al. eds., 15th ed. 2011) [hereinafter *Introduction to Belgian Law*].

[35] *Id.*

[36] Matxalen Sánchez Aranzamendi, *Economic and Policy Aspects of Space Regulation in Europe, Part I: The Case of National Space Legislation – Finding the Way between Common and Coordinated Action*, 21 EUROPEAN SPACE POLICY INSTITUTE 18 (Sept. 2009).

[37] *See* SPACEBEL, http://www.spacebel.be/ (last visited Feb. 28, 2013).

[38] *Hellma in Space*, HELLMA, http://www.hellma.be/text/677/en/news-hellma-benelux.html (last visited Feb. 28, 2013).

tion agreements with other States. Due to the increasing commercial space activities and the resulting probability of becoming responsible under international law, the Council of State provided the Minister for Science Policy with its recommendations concerning the draft Belgian Space Act at the end of 2004.[39] The aim was the implementation of international outer space law in the national legal framework[40] and the creation of a legal framework for existing or emerging activities in Belgium, as well as possible activities to be performed by Belgian citizens. The Law entered into force on 1st January 2006 as the Law of 17 September 2005.[41]

The Belgian Space Law responds to the specific needs of a small State actively involved in international cooperation and activities and considers the regulation of the relevant issues in a pragmatic way. The main reason for the elaboration of a national space act was the country's fear of being held liable for activities beyond its supervision and control according to Article VII[42] of the Outer Space Treaty.[43] Article VII with its notion of "launching State," including any legal or natural person of the nationality of the State was also of concern for Belgium. The Belgian Space Law is the first law in Europe that makes explicit reference to both Article VII of the Outer Space Treaty and to the Liability Convention.[44] The Law is based on the following three pillars: (1) authorization and supervision of space activities, (2) registration of space objects, and (3) liability actions.[45]

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[39] Jean-Francois Mayence, *Implementing the United Nations Outer Space Treaties - The Belgian Space Act in the Making*, PROC. 47TH COLLOQUIUM L. OUTER SPACE 134 (2004).

[40] *Id.*

[41] Law on the Activities of Launching, Flight Operation or Guidance of Space Objects of Nov. 16, 2005, Moniteur Belge [M.B.] [Official Gazette of Belgium], *adopted* Mar. 19, 2008., *entered into force* Apr. 11, 2008 [hereinafter Belgian Space Law].

[42] Outer Space Treaty, *supra* note 19.

[43] *Introduction to Belgian Law, supra*, note 34.

[44] Armel Kerrest de Rozavel & Frans.G. von der Dunk, *Liability and Insurance in the Context of National Authorisation*, *in* FRANS.G. VON DER DUNK, ED., NATIONAL SPACE LEGISLATION IN EUROPE 125, 133 (Martinus Nijhoff Publishers, Leiden-Boston, 2011).

[45] Jean-Francois Mayence, *Granting Access to Outer Space: Rights and Responsibilities for States and their Citizens An Alternative Approach to Article VI of the Outer Space Treaty, Notably Through the Belgian Space Legislation*, *in* FRANS.G. VON DER DUNK, ED., NATIONAL SPACE LEGISLATION IN EUROPE 73, 118 (Martinus Nijhoff Publishers, Leiden-Boston, 2011) [hereinafter *Granting Access to Outer Space*].

All are crucial for small satellites and are relevant for the compliance with a State's responsibility under Article VI.

So far, the Belgian Space Law has not been applied to any particular space activity and no space object has been registered.[46] However, this may change in the near future. As a first step, a mission involving a small satellite called *OUFTI* has been developed and constructed in the framework of a national project led by the University of Liège.[47] It was designed in Belgium and funded by the Belgian government. As in Austria, this small university satellite mission was the first Belgian space activity outside the frame of ESA programs.

Nevertheless, other than originally planned, *OUFTI* will not be launched on a Vega demonstration flight but will rather be integrated in the large QB50 project in the FP7 of the EU. Yet, this will not change the role of Belgium in this context. On the contrary, the Belgian Von Karman Institute for Fluid Dynamics is the lead institute in the QB50 project.[48] It will eventually sign the contract with the Russian launch provider. It is planned that the 50 CubeSats will be launched together in 2014 by a single Shtil-2.1 from Murmansk in northern Russia into a circular orbit at 320 km altitude.

C. Netherlands

The Netherlands also has a long tradition in space research with considerable knowledge in the scientific and technical space sector and has been involved in space activities since the late 1950s.[49] The country is engaged in international cooperation within ESA and contributes strongly to the European Space Agency. Approximately seventy percent of the Dutch space

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[46] *Id.* at 120.

[47] *Id*.

[48] *See* Press Release, Von Karman Institute for Fluid Dynamics, QB50, a network of 50 small satellites in space, approved by the European Commission, https://www.vki.ac.be/index.php?option=com_content&view=article&id=249&Itemid=400%20target= (last visited Feb. 28, 2013).

[49] *See* Daan de Hoop, *Space Activities in The Netherlands – A Short History*, *in* BRUCE BATTRICK, LORRAINE CONROY, EDS., PROC. OF THE CONCLUDING WORKSHOP THE EXTENDED ESA HIST. PROJECT 75 (2005).

budget is used to fund ESA programs. Established in 1968 in Noordwijk, the European Space Research and Technology Centre (ESTEC) is the largest site of ESA.

The Netherlands is among the States that have ratified all five UN treaties on outer space and is a member in the major international organizations like INTELSAT, INMARSAT, EUTELSAT, and EUMETSAT.[50] The enactment of a Dutch Space Activities Act originated from the necessity to implement the obligations arising out of the five UN space treaties. This necessity followed the emergence of non-governmental outer space activities with certain connections to the Netherlands. These connections included the presence of private companies, which were active in the increasingly commercialized telecommunications sector.[51] The planned participation of the Dutch company MirCorp in a Russian space tourism project also raised awareness of the possibility of Dutch legal involvement under international space law.[52]

Although the emphasis of space activities lays on international cooperation, the Netherlands can register autonomous Dutch space activities as well. Two Dutch-built satellites have been launched so far: the ANS (Astronomical Netherlands Satellite) in 1974 and the IRAS (Infra-Red Astronomical Satellite) in 1983.[53] The elaboration of a national space law was also triggered by the continuous market growth after 2002. New Skies NV, which had emerged from INTELSAT as a separate company and had incorporated in The Netherlands in 1998, and to which six satellites in orbit were transferred to,[54] was in need of

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[50] *Id.* at, 226 et seq.

[51] Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., *Information on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space: Reply of the Netherlands*, Mar. 22-Apr. 1, 2010, U.N. Doc. A/AC.105/C.2/2010/CRP.11, at 1 (Mar. 23 2010), *available at* http://web1.olemiss.edu/ncrsasl/atlas/archive/files/2f91e6a213433ae5d64a4df5a5f3f40d.pdf (hereinafter *Reply of the Netherlands*).

[52] Frans von der Dunk, *Regulation of Space Activities in The Netherlands*, *in* RAM S. JAKHU, ED., NATIONAL REGULATION OF SPACE ACTIVITIES 231 et seq. (Springer – Dordrecht. 2010).

[53] *Id.* at 225.

[54] However, the Netherlands notified to OOSA that it did not consider itself as "launching State" or "State of registry", but would bear international responsibility for the satellites' operation. *See* FRANCIS LYALL AND PAUL LARSEN, SPACE LAW: A TREATISE 337 (Ashgate, Surrey 2009).

additional capacity and launched a number of satellites on its own.[55] The legal consequences of this activity prompted the Netherlands to draft a national space law. The Dutch Parliament enacted the Dutch Space Activities Act[56] on January 24, 2007 and it entered into force on January 1, 2008.[57] The law entered into force only with effect to the European part of the Netherlands and does not apply to the six islands in the Caribbean, Aruba, and the five Netherlands Antilles.[58]

Since then, one small Dutch satellite has been put into orbit, namely the CubeSat *Delfi-C3* of the Delft University of Technology. It was launched by an Indian launcher in 2008.[59] A follow-up is already in preparation, namely the *Delfi-n3Xt (move in space)* to be launched in 2013.[60]

Furthermore, the Dutch Company ISIS (Innovative Solutions In Space BV), established in 2006 as a spin-off of the *Delfi-C3* nanosatellite project from Delft University of Technology, is of notable mention. The company offers a broad range of turnkey nanosatellite solutions, ranging from standard CubeSat solutions in the 1-4 kilogram range to 20 kilogram compact microsatellites.[61] In particular, ISIS is also actively involved in the QB50 project under the EU FP7 for which it provides a variety

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[55] *Regulation of Space Activities in The Netherlands*, *supra* note 52, at 234.

[56] Law Incorporating Rules Concerning Space Activities and the Establishment of a Registry of Space Objects, 80 *Staatsblad* (2007) 1 [hereinafter Dutch Space Activities Act].

[57] The Dutch Space Activities Act is implemented by the Space Objects Registry Decree of 13 November 2007 that entered into force together with the Act and the Order Concerning Licence Applications for the Performance of Space Activities and the Registration of Space Objects of 7 February 2008, which entered into force on 22 February 2008. Heleen De Brabander-Ypes*, Introduction to the Law Incorporating Rules Concerning Space Activities and the Establishment of a Registry for Space Objects, in* 5 SPACE LAW: BASIC LEGAL DOCUMENTS E.XIV (Karl-Heinz Böckstiegel et al. eds., 15th ed. 2011); *Reply of the Netherlands, supra* note 51.

[58] *See Regulation of Space Activities in The Netherlands*, *supra* note 52, at 237 (2010).

[59] Tanja Masson-Zwaan, *The (non-)Applicability of the Netherland's Space Activities Act to certain "Dutch" Space Activities*, *in* 6TH EILEEN GALLOWAY SYMPOSIUM (Dec. 1, 2011), at slide 12, http://www.iislweb.org/docs/2011_galloway/Masson-Zwaan.pdf (last visited Feb. 28, 2013).

[60] *See* Delfi Space, http://www.delfispace.nl/index.php/delfi-n3xt (last visited Feb 28, 2013).

[61] *See* Innovative Solutions in Space, http://www.isispace.nl/cms/index.php/2011-07-20-09-31-21/isis-in-brief (last visited Feb 28, 2013).

of products. In its "one-stop-shop" for CubeSats and nanosats systems, it offers a series of standardized, off-the-shelf components and subsystems for a variety of manufacturers.[62]

It follows that small satellites will play an important role in the Netherlands in the near future by using and driving the market for miniaturised space systems. However, as will be shown, the Dutch national space legislation does not necessarily apply to all of these space activities undertaken in the Netherlands.

III. SELECTED ISSUES RELATING TO THE APPLICABILITY OF THE AUSTRIAN, BELGIAN, AND DUTCH SPACE LEGISLATION REGARDING SMALL SATELLITES

The Austrian, Belgian and Dutch national space laws have been elaborated in view of increasing private space activities. These also include projects of small satellites which are often developed by institutions independent from the State. All three national space laws are meant to be comprehensive and to deal with all the legal aspects connected to space activities, such as authorization, supervision, registration, liability, insurance, transfer of the space object, as well as enforcement and sanctions. The national space laws have been characterized as space laws of the so-called second generation that aim at creating a comprehensive legal framework for nascent commercial space activities.[63] However, they are different from each other in terms of their scope of application, their liability and insurance regimes, as well as their regulations concerning space debris mitigation. In particular, the three States have taken different approaches as regards to the applicability of their legislation to small satellites.

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[62] *See* CubeSatShop, http://www.cubesatshop.com/ (last visited Feb. 28, 2013).
[63] Aranzamendi, *supra* note 36, at 4.

A. Scope of Application

i. Austria

Section 1(1)(3), makes it clear that the Austrian Outer Space Act is not only applicable to space activities carried out in Austrian territory and on board of vessels or airplanes registered in Austria, but also by a natural person with Austrian citizenship or legal persons seated in Austria.[64] This broad scope of personal jurisdiction, which is not shared by all countries,[65] covers activities undertaken by Austrian universities as well as private law subjects. Thus, it also targets small satellite programs such as those by the Technical University of Graz and the University of Vienna. The definition of "national" activity is thus not limited to activities carried out by State entities but also by non-State entities with Austrian citizenship. The only limitation is that space activities by Austrian citizens are only covered if they are involved as "operators," that is, the Act will not apply if they only collaborate in space activities and do not act on their own account.[66]

This is in line with the requirement of Article VI of the Outer Space Treaty which demands authorization and continuing supervision of space activities carried out by non-governmental entities. However, the obligations of the entities targeted by the Act are not limited to the authorization obligation but also encompass the obligation to register.[67] Even if the obligation to register is not automatic, because Section 9 of the

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[64] Austrian Outer Space Act, *supra* note 23, § 1(1)(3). The definition follows the general principle of public international law that a State may only be made responsible for such activities over which it can exercise territorial and personal jurisdiction. *See* Michael Gerhard, *Article VI*, *supra* note 20, at 113-12.

[65] Some States limit the personal scope of application of the space acts to areas that are not subject to the sovereignty of any State (Norway), or make it subject to international agreements (Belgium), or to respective secondary legislation (the Netherlands). *See* Michael Gerhard, *Article VI*, *supra* note 20, at 114. Also many other States, such as Sweden, South Africa, Australia, France, England, and the USA have included a broader personal scope of application of their respective space laws. *See id.* at 114-15.

[66] *See* Austrian Outer Space Act, *supra* note 23, § 2, which contains a number of definitions, including the term "space operator". See also the explanations in the "Materials" to the Austrian Outer Space Act, *supra* note 14, at 2-4.

[67] *See* Austrian Outer Space Act, *supra* note 23,§§ 9-10.

Act qualifies that only objects "for which Austria is considered to be the launching State" the burden of proof to show which State is the launching State is incumbent on the space operator according to the Liability Convention. If the operator does not register such object, it will be considered as a violation of the Act.

Furthermore, the scope of application does not differentiate whether the space activity is sponsored in whole or in part by Austrian public funds. Thus, Austria's responsibility also includes privately funded programs. This avoids the risk of control deficits, in particular with regard to small satellite programs.

ii. Belgium

According to Article 2, section 1, the 2005 Belgian Space Law covers:

> activities of launching, flight operations and guidance of space objects carried out by natural or legal persons in the zones placed under the jurisdiction or control of the Belgian State or using installations, personal or real property, owned by the Belgian State or which are under its jurisdiction or its control.[68]

Activities carried out by natural or legal persons of Belgian nationality, irrespective where they are carried out, fall under the Law when it is provided for in an international agreement.[69] Thus, the Law primarily applies the territorial criterion, whereas the personal criterion is used only in a subsidiary manner when an international agreement prescribes it.

The Belgian Space Law defines a "flight operation" and "guidance" as an "operation relating to the flight conditions, navigation or evolution in outer space of the space object, such as the control and correction of its orbit or its trajectory."[70] The problem in relation to small satellites is that, after positioning in orbit, no further manoeuvring of the satellite is possible. It is

[68] Belgian Space Law, *supra* note 41, at art. 2, § 2
[69] Belgian Space Law, *supra* note 41, at art. 2, § 2.
[70] *Id.* at art. 3, No. 5.

not clear if the mere sending and receiving of signals, even if performed on Belgian territory can be regarded as a "flight operation" or "guidance." It has been pointed out that once placement in orbit is achieved, the flight is autonomous, without any propulsion or guidance capacity which would then exclude the applicability of the Belgian Space Law to such satellites.[71]

The same may result if one rests on the "operator" who is defined in Article 3, Number 2, as a "person that carries out or undertakes to carry out the activities . . . by ensuring, alone or jointly, the effective control of the space object."[72] "Effective control" means control of the "means of control or remote control and the related means of supervision, necessary for the implementation of the activities of launching, the flight operations and guidance of one or more space objects."[73] As small satellites usually are not controllable in the sense of orbit correction and thus are beyond human control, no effective control is possible. The lack of manoeuvrability may be regarded as a lack of activity of small satellites and excludes them from the definition of space activity provided for in the law, and thus, from the scope of its application.[74] As a consequence, small satellites would fall outside the scope of application of the Belgian Space Law and would not be "authorized" and "supervised" by the Belgian authorities.[75]

As regards the question if Belgium would consider itself as a "launching State" of small satellites, the situation is not very clear. The definition of "launching State" referred to in Article 3, Number 11 in the Belgian Space Law refers to the definition stated in the 1972 Liability Convention and the 1975 Registration Convention. These definitions include the State which "procures" the launch. While small satellites of public universities may fall under this definition, as in the case of the *OUFTI* of the

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[71] *Granting Access to Outer Space, supra* note 45, at 73, 120.

[72] Belgian Space Law, *supra* note 41, at art. 3, § 2.

[73] *Id.* at art. 3, No. 3.

[74] *Granting Access to Outer Space, supra* note 45, at 73, 120; *see also* Diane Howard, *The Sixth Eilene M. Galloway Symposium on Critical Issues in Space Law. A Comparative Look at National Space Laws and Their International Implications* 2 (Dec. 1, 2011) *available at* http://www.iislweb.org/docs/2011_galloway/Galloway_report.pdf.

[75] *Orbiting under the Radar*, *supra* note 8.

University of Liège,[76] the situation is more uncertain as regards satellites launched by other institutions or companies, such as the Von Karman Institute in the QB50 project of the EU FP7. It seems that Belgium considers adopting a pragmatic solution for the satellites participating in the QB50 project. The Belgian government intends to issue a statement in which it associates itself with the launch, and therefore "co-procures" the launch of the space object.[77] This governmental endorsement will clarify the situation and will help to clearly identify Belgium as one of the launching States which, for liability and registration purposes, is of utmost importance. However, this solution creates, on the other hand, uncertainties as regards to other small satellite projects for which such a governmental endorsement will perhaps not be possible to achieve.

The uncertainty as regards to the applicability of the 2005 Belgian Space Law to small satellites was one of the reasons for an initiative to reform it. The proposal for an amendment of the Law includes a new wording of the definitions of the terms "operator," "effective control," "flight operation," and "guidance." Thereby, the coverage of small satellite projects would be explicitly addressed. The signature of the draft by the King is expected soon so that it can be passed by the Belgium Parliament in 2013. The new version of the Belgian Space Law would then clearly be applicable to small satellite missions initiated and controlled by actors on Belgian territory which is a desirable result.

iii. Netherlands

According to Section 2, para. 1, of the Rules Concerning Space Activities and the Establishment of a Registry of Space Objects (2007 Dutch Space Activities Act),[78] space activities that are performed in or from within the Netherlands, or else on or from a Dutch ship or Dutch aircraft, fall under the Act's scope of

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[76] *Granting Access to Outer Space*, *supra* note 45, at 73, 120.
[77] *Orbiting under the Radar*, *supra* note 8.
[78] Dutch Space Activities Act, *supra* note 56.

application.[79] Furthermore, the Act can be declared wholly or partly applicable by Order in Council for designated space activities that are performed by a Dutch natural or juridical person on or from a ship or aircraft that falls under the jurisdiction of a State that is not party to the Outer Space Treaty, as well as for the organization of outer-space activities by a natural or juridical person from within the Netherlands.[80]

The Act primarily applies the territorial criterion in a broad sense, covering also activities on Dutch ships and airplanes.[81] The nationality criterion, however, is applied only with the aim to fill gaps in international responsibility in cases when space activities are conducted by Dutch nationals in the territory of a State that is not a party to the Outer Space Treaty.

The Act defines "space activities" as "the launch, the flight operation or the guidance of space objects in outer space."[82] According to the Act's explanatory memorandum, the term "guidance of space objects" includes "all command and control activities in relation to a space object (usually a satellite) – e.g. the execution of major and minor manoeuvres designed to keep a satellite in its position in outer space or to adjust its position/orbit (. . .)."[83] It follows that, similar to the 2005 Belgium Space Law, the Dutch Act stresses the manoeuvrability of the space object, which usually is not existent in the case of small satellites. It is therefore unclear if small satellites fall under the scope of application of the Act.

Although the Dutch Space Activities Act was already in force, the Act was not applied in 2008 upon the launch of the *Delfi-C3* nanosatellite project from Delft University of Technology. This has caused criticism and concern by commentators who point out that this practice results in the lack of obligation to obtain a license for conducting small satellites activities which nevertheless pose risks and dangers to the space envi-

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[79] *Id.* at sec. 2(1).

[80] *Id.* at sec. 2(1)(b).

[81] *See Regulation of Space Activities in The Netherlands*, *supra* note 52, at 237.

[82] Dutch Space Activities Act, *supra* note 56, at sec. 1(b).

[83] Dutch Space Activities Act's Explanatory Memorandum, *cited in, Orbiting under the Radar*, *supra* note 8.

ronment.[84] Furthermore, such exclusion of small satellites from the concept of "national space activities" may conflict with the State's international responsibility for such activities, as Article VI, does not distinguish between manoeuvrable and non-manoeuvrable space objects. The "space activity" for which the State is responsible encompasses in any case the positioning in an orbit of a space object, even if after that no change in the position is possible.

The Dutch practice of not considering itself a "launching State" in cases where not the State itself but rather a private entity under Dutch jurisdiction "procures" the launch has also been criticized.[85] This, however, does not only concern small satellites but also larger satellites.

In order to accommodate the concerns raised against the non-licensing of small satellites, the Dutch administration has started to reconsider its policy. In August 2012, the Dutch Minister for Economic Affairs, Agriculture and Infrastructure agreed to broaden the scope of the 2007 Space Activities Act, so that guidance and operation of non-manoeuvrable small satellites from the Netherlands become a national space activity and fall under the licensing regime.[86]

Considering small satellite projects as "national space activities" under Art. VI would be a first step to fully include them under the scope of the national legislation. This should eventually also lead to the recognition of the Netherlands as a "launching State" for liability and registration purposes. In particular, the lack of registration of small – or larger – satellites procured by Dutch nationals might lead to an important disadvantage for them. More and more launch providers demand in the launching contract that the space object should be registered by the home country of the procurer. If that home country does not allow for registration of such space objects, the operator might not get a contract to launch the space object.[87] Such a result should be avoided for the benefit of the nascent small satellites com-

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[84] *Orbiting under the Radar*, *supra* note 8.
[85] *Id*.
[86] *Id*.
[87] *Id.*

munity. It is another argument to make national space legislation fully applicable to small satellites.

B. Liability, Recourse and Insurance

i. Austria

Section 3 of the Austrian Space Law Act contains a general obligation of authorization of space activities with the conditions regulated in Section 4. In this context, the issue of liability has been of utmost concern to the Austrian ministries involved in the drafting process, in particular the Ministry of Finance. It should be made sure that damage caused by private space objects should ultimately not remain an issue of liability for the Austrian State. Because of this issue, insurance is one of the conditions for authorization of the space activity. Section 4, paragraph 4 provides that "[i]n order to cover liability for damages caused to persons and property, the operator is under the obligation to take out an insurance covering a minimum amount of €60 000 000 per insurance claim."[88]

However, the Ministry for Transport, Innovation and Technology wanted to avoid an obligation of insurance that would be prohibitive for developers of small satellites, such as the Technical University of Graz and the University of Vienna. Therefore, it commissioned a study to assess the risk of the two small satellites causing damage. The study eventually showed that the risk of small satellites of causing damage on Earth would be very

[88] This amount is taken from the French example and has to be adjusted from time to time. Due to Article 18 of the Austrian Federal Constitution Law, it would not have been possible to provide for an unspecified amount, such as "the maximum probable loss"' as it is contained in other national space laws, for example in other countries, such as Australia and in the United States. Article 18 of the Federal Constitutional Law (B-VG) stipulates in paragraph 1, "[t]he entire public administration shall be based on law." BUNDES-VERFASSUNGSGESETZ [B-VG] [CONSTITUTION], *supra* note 21, at art. 18, para. 1. This provision is generally interpreted as providing for the legality of the actions of the administration and the prevention of arbitrariness. The Constitutional Court interprets this provision rather strictly paying due regard to the intentions and the legal theory of the drafter of the Austrian Constitution, Hans Kelsen. *See* Aranzamendi, *supra* note 36, at 11-15 (ESPI report on national space legislation which includes a table on the different insurance obligations).

low or even zero.[89] It explained that the satellites constructed by the two universities would almost inevitably burn up upon re-entry into the Earth atmosphere.

Therefore, it was concluded that small satellites for science and research and education should be exempted from the obligation of insurance. After several drafts and negotiations between various ministries, the following solution was decided:

> [i]f the space activity is in the public interest, the Minister for Transport, Innovation and Technology may determine a lower sum or release the operator from the insurance requirement by administrative decision, taking into account the risks connected to the activity and the operator's financial capacity. Space activities are in the public interest if they serve science, research or education. For other satellites, in particular large commercial satellites, the obligation to obtain insurance is clearly kept.[90]

As Austria is liable for damage caused by a space object of which it is considered the "launching State" under international law,[91] the Austrian Outer Space Act provides for a right of recourse of the government against the operator.[92] Section 11, paragraph 2 specifies that "[f]or damage caused on the surface of the Earth or to aircraft in flight, the right of recourse comprises an amount up to the sum of the insured risk, but no less than the minimum amount of insurance set out [under Section 4]." This limitation does not apply if the damage is due to

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[89] Hans-Peter Rösler & Bernhard Schmidt-Tedd, *Studie zu Start, Betrieb und Risiken von Kleinsatelliten* (*Study to Start, Operate and the Risks of Small Satellites*), insbesondere BRITE-AUSTRIA (Sept. 2009) (on file with author).

[90] Austrian Outer Space Act, *supra* note 23, subsec. 4(1)(4)

[91] *See* Outer Space Treaty, *supra* note 19, at art. VII; Liability Convention, *supra* note 19, at arts. II & III.

[92] The right of recourse of the State against the operator needs to be laid down by law. *See* MICHAEL GERHARD, NATIONALE WELTRAUMGESETZGEBUNG: VÖLKERRECHTLICHE VORAUSSETZUNGEN UND HANDLUNGSERFORDERNISSE [NATIONAL SPACE LAW: INTERNATIONAL REQUIREMENTS AND ACTION REQUIREMENTS] 147 (2002); Irmgard Marboe, Österreich als "Startstaat" – rechtliche Konsequenzen'[Austria as a "Launching State" - Legal Consequences], *in* [LISBON TO THE SPACECRAFT: CURRENT CHALLENGES IN INTERNATIONAL LAW] 11, 26 (Sigmar Stadlmeier ed., Vienna 2011)

fault by the operator or his agents or if the operator has carried out the space activity without authorization.[93]

Furthermore, it must be pointed out that in regards to the liability of the operator, the provisions of the General Civil Code (Allgemeines Bürgerliches Gesetzbuch (ABGB)) and pertinent rules under other federal laws are applicable.[94] Also, with regard to the hazardous nature of space activities, the principles on liability for hazardous activities developed by jurisprudence must be taken into account.

ii. Belgium

The Belgian law was characterized as a law with an open basis for authorization and a rather precise liability regime.[95] According to Article 4, section 1, any person who wants to carry out activities covered by Article 2, must obtain an authorization that will be granted on a personal basis. Article 4, section 3 imposes the general condition that the activities must comply with international law principles. Also, the King may determine special conditions for granting authorizations "with a view to ensuring the safety of people and property, protecting the environment, ensuring the optimal use of air space and outer space, protecting the strategic, economic and financial interests of the Belgian State . . . ."[96] Finally, the Minister may attach further specific conditions that the Minister may deem useful on a case-by-case basis.[97] In particular, the Minister may create an obligation for insurance to be taken out in favour of third parties to cover the damage that may result from the space activity. As the formulation of the law provides for the prescription of an obligation for insurance on a case-by-case basis, it is possible that it will not be prescribed for small satellites.

Furthermore, the Minister may limit the authorization granted for a specific period of time.[98] The access to premises,

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[93] Austrian Outer Space Act, *supra* note 23, at art. 11(2).
[94] See the "Materials" to the Austrian Outer Space Act, *supra* note 14, at 12.
[95] Aranzamendi, *supra* note 36, at 18.
[96] Belgian Space Law, *supra* note 41, at art. 5, § 1.
[97] *Id.* at art 5 §. 2.
[98] Granting access to outer space, *supra* note 45, at 119.

facilities, and documentation relevant for the assessment of the activities is imposed by the law.[99]

Article 15 of the Law[100] provides for a right of recourse against the operator in the case that the Belgian State is liable for damages pursuant to Article VII of the Outer Space Treaty[101] or the provisions of the Liability Convention.[102] The amount of compensation under such an action is determined in accordance with Article 15, section 2. The amount of compensation may be limited by the King, especially on a percentage of the operator's average revenue. The ceiling amount is calculated on the basis of the estimated damage's value by the King.[103] In this case, Belgium bears the remaining part of the indemnification costs.[104] The aim of the compensation's limitation is to avoid an unlimited liability of the operator and to enable him to insure the risk under reasonable conditions.[105] The Belgian State also has a right of recourse against the operator's insurer, which is not subject to any prior action.[106] As the potential risk evolving from small satellites is comparably small, operators of small satellites will probably benefit from the compensation's limitation. Thus, in order to support small industry, the Law balances the mitigation of possible liability with the aim that commercial activities are not charged with the condition of an expensive insurance and compensation.

iii. Netherlands

In regards to the prerequisites for obtaining a license under the Dutch Law, it has been noted that the Act remains a framework law with the necessary flexibility for the Dutch au-

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[99] *Id.*

[100] Belgian Space Law, *supra* note 41, at art. 15.

[101] Outer Space Treaty, *supra* note 19.

[102] Liability Convention, *supra* note 19.

[103] *Implementing the United Nations Outer Space Treaties - The Belgian Space Act in the Making*, *supra* note 39, at 138.

[104] *Id*.

[105] *The Belgian Law on the Activities of Launching*, *supra* note 32, at 17-18.

[106] *See* Belgian Space Law, *supra* note 41, at art. 15, § 7

thorities to add further requirements as the expertise grows[107] and to impose additional requirements when needed (Section 4).[108]

According to Section 3(4), the licensee shall get insurance against any liability "arising from the space activities for which a license is required," as far as judged reasonable by the Minister of Economic Affairs.[109] Account is taken of what can "reasonably be covered by insurance."[110] In order to implement this provision, further rules can be imposed by Ministerial Order according to Section 3(7). After the changes of the law, insurance will become an obligation for space activities including small satellites. As there is no market for insurance of these kinds of activities at the moment, the gap will have to be filled.[111]

Although the maximum level of coverage is required for the financial risks, account is taken of the customary level of insurance coverage in a particular sector of space activities.[112] The extent of the insurance coverage will be determined on the basis of advice from experts in the fields of risk assessment and space-travel insurance.[113] This risk-assessment could help private companies and academic institutions to operate small satellites, as the costs for obtaining a licence could remain at a lower level in view of the lower risks in the context of small satellites. Thus, space activities will probably be affordable for

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[107] *See* Frans G. von der Dunk, *Implementing the United Nations Outer Space Treaties – The Case of the Netherlands*, *in* NATIONALES WELTRAUMRECHT/ NATIONAL SPACE LAW DEVELOPMENT IN EUROPE – CHALLENGES FOR SMALL COUNTRIES 92, 100 (Christian Brünner & Edith Walter eds., Vienna 2008).

[108] *Regulation of Space Activities in The Netherlands*, *supra* note 52, at 239.

[109] *Implementing the United Nations Outer Space Treaties – The Case of the Netherlands*, *supra* note 107.

[110] Dutch Space Activities Act, *supra* note 56, at subsec. 3(4).

[111] *Orbiting under the Radar*, *supra* note 8, at 6.

[112] Explanatory Memorandum to the Space Activities Act, Commentary to Section 3, subsections 4 & 7 (June 13, 2006),; for the Dutch version of the memorandum *see Tweede Kamer der Staten Generaal, Vergaderjaar 2005-2006*, 30 609, nr.3 (unofficial English translation on file with the authors). *See also* Cécile Gaubert, *Insurance in the Context of National Authorisation*, *in* FRANS.G. VON DER DUNK, ED., NATIONAL SPACE LEGISLATION IN EUROPE 166, 168 (Martinus Nijhoff Publishers, Leiden-Boston, 2011).

[113] Explanatory Memorandum to the Space Activities Act, *supra* note 112, at Commentary to Section 3, subsections 4 & 7.

small and medium companies as well as for academic institutions.

In the case that the Netherlands is obliged to pay compensation under Article VII of the Outer Space Treaty or the Liability Convention, the State is entitled "to recover this sum, in full or in part, from the party whose space activity has caused the damage."[114] However, this approach of unlimited compensation is qualified and can be mitigated as a result of the clauses limiting the licensee's liability, as well as the actual reimbursement of the Dutch government "to the value of the sum insured, as specified in Section 3, subsection 4" (e.g. referring to the clause calling upon the Dutch government to determine the "maximum probable cover").[115] The explanatory memorandum applies a version of the Maximum Probable Loss concept in the same way as is seen in comparable clauses in the U.S. and Australian national licensing regimes. [116] The possibility to limit compensation allows the State to take into account the concrete circumstances of every case. Alternatively, the Netherlands may exercise this right against the insurer to compensate the licensee.[117]

C. Mitigation of Space Debris

The increasing use of small satellites can jeopardize the initiatives on the mitigation of space debris because they often lack manoeuvring capability. Once in orbit, they usually remain there and cannot be removed. Depending on the orbit, this can mean hundreds of years. During this time, they represent a dangerous threat to expensive functional space craft. Put bluntly, it may be said that, from the perspective of owners and operators of sophisticated satellite missions, small satellites are nothing more than future space debris.

On the other hand, small satellites have a lot of potential. Not only are they an important means for developing knowhow

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[114] Dutch Space Activities Act, *supra* note 56, at subsec. 12(1).

[115] *Implementing the United Nations Outer Space Treaties – The Case of the Netherlands*, *supra* note 107, at 92, 100; , *Liability and Insurance in the Context of National Authorisation*, *supra* note 44, at 125, 133.

[116] *Regulation of Space Activities in The Netherlands*, *supra* note 52, at 242.

[117] Dutch Space Activities Act, *supra* note 56, at subsec. 12(4).

in emerging space faring nations, but for technological development in general. The development of microtechnology may bring important achievements for larger space projects.[118] Furthermore, the issue of debris removal has been addressed by a number of researchers with original ideas.[119] Therefore, small satellites can be a threat or a chance in the area of space debris mitigation. In national space legislations, States may have to find a proper balance between the preservation of the space environment and the fostering of new technological developments. Measures to avoid space debris are crucial but should not be implemented in a prohibitive manner.

For the Ministry for Transport, Innovation and Technology in Austria, the avoidance of space debris has been an important concern. The obligation to mitigate space debris is expressly contained in two articles of the Act. First, it appears as a condition for authorization.[120] Second, it is specifically outlined in Section 5 that "[t]he operator has to make provision for the mitigation of space debris in accordance with the state of the art and in due consideration of the internationally recognized guidelines for the mitigation of space debris. Especially measures limiting debris released during normal operations have to be taken."[121]

The condition of Section 1, paragraph 1, letter 4 has to be read and applied in combination with Section 5.[122] The "internationally recognized guidelines for the mitigation of space debris" mentioned in Section 5 are first and foremost the 2002 Space Debris Mitigation Guidelines of the Inter-Agency Space Debris Coordination Committee (IADC),[123] which constitutes the most important international forum for the global coordination of ac-

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[118] *See* Balogh, *supra* note 9, at 325, 327.

[119] *See, e.g.,* Alex Da Silva Curiel, University of Surrey, Presentation at the UN/ESA/Austria Symposium on Small Satellite Programmes for Sustainable Development, *Space Debris – Issues and Mitigation Measures* (Sept. 15, 2011), http://www.unoosa.org/oosa/SAP/act2011/graz/index.html.

[120] Austrian Outer Space Act, *supra* note 23, § 4(1)(4).

[121] *Id.* § 5.

[122] See the explanations in the "Materials" to the Austrian Outer Space Act, *supra* note 14, at 8.

[123] *See* IADC Space Debris Mitigation Guidelines (Oct. 15, 2002), http://stage.tksc.jaxa.jp/spacelaw/kokusai_utyu/space_debris2/IADC.pdf (last visited Feb. 28, 2013).

tivities in connection with artificial and natural space debris.[124] In addition, the UNCOPUOS Space Debris Mitigation Guidelines of 2007[125] should also be used as a point of reference.[126] Thus, the obligation to mitigate space debris as contained in the Act encompasses, in particular, to limit debris released during normal operations, to minimize the potential for on-orbit breakups, to provide for post mission disposal and to prevent on-orbit collisions.

As regards small satellites, the IADC Guidelines provide that they should be left in an orbit in which atmospheric drag will limit the orbital lifetime after completion of operations to a maximum of 25 years.[127] This is, however, a condition which is not easy to comply with. In the UNCOPUOS Guidelines, this criterion has not been included. The problem is that small satellites are generally only secondary payloads. They depend on the necessities of the primary payload and have usually little influence on the selection of the orbit. The 25-year-limit is therefore a difficult condition. For the two Austrian nano satellites, a transitional provision was inserted which exempts them from this requirement.[128] Their envisaged orbit would not comply with the 25-year-limit, but the satellites were commissioned before the Act entered into force. Regardless, future missions must, in principle, comply with this criterion.

In contrast, neither the Belgium nor the Dutch Act requires the licensee to provide for space debris mitigation measures expressly. However, the impact of the space activity on spatial environment, including its consequences of space debris, could be required under Article 8, section 2 of the Belgian law. This clause establishes that a study shall be carried out before an authorization is granted that assesses the potential impact on the environment in outer space of the launch or operation of the space object. The same is true for the Dutch law according to

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[124] See the "Materials" to the Austrian Outer Space Act, *supra* note 14, at 8.

[125] *See* Comm. on the Peaceful Uses of Outer Space, Legal Subcomm., *Space Debris Mitigation Guidelines*, *available at* http://www.oosa.unvienna.org/pdf/publications/st_space_49E.pdf (last visited Feb. 28, 2013).

[126] See the "Materials" to the Austrian Outer Space Act, *supra* note 14, at 8.

[127] *See* IADC Space Debris Mitigation Guidelines, *supra* note 123, at Guideline 5.3.2.

[128] Austrian Outer Space Act, *supra* note 23,§ 15.

which regulations and purposes can be attached to the license for the purpose of "protection of the environment in outer space."[129] Thus, although not expressly mentioned in these two Acts, the avoidance of space debris probably is also an issue of concern and respective measures of the operators might be required under the general provisions concerning the environment.

IV. CONCLUSION

Austria, Belgium, and the Netherlands are rather small countries where the necessity of national space legislation became obvious after the emergence of space activities exercised by private operators. It can be envisaged that small satellites will play an important role in the space activities of these countries in the future. The national legislation of these States thus had to find a balance between a legal regime that would implement the States' obligations under international law and a certain flexibility that would allow supporting small operators and scientific institutions. Although Belgium and the Netherlands originally did not include non-maneuverable small satellites in their scope of application, respective criticism has led to a change of approach in both countries, as a consequence of which a revision of relevant provisions are now in progress. After the changes, the laws will cover all kind of small satellites, falling under the general application of the laws, which are, *per se*, favorable of nascent space activities.

The three laws all allow for the waiver of certain conditions in the authorization process, depending on the specific case. In the Austrian and Dutch laws, taking out insurance is an obligatory requirement for the authorization of space activity. However, the possible exemption for satellites "in the public interest" provided for in the Austrian Act is one of the most tangible signals of support of small satellite programs. Under the Dutch law, the result is a lower insurance since the Minister considers the maximum possible cover for the liability arising from the space activities. The Belgian Law has opted for a case-by-case

[129] Dutch Space Activities Act, *supra* note 56, at subsec. 3(3)(c).

assessment complemented by a strong control system where the Minister decides in each case whether an insurance obligation will be prescribed.

Furthermore, all three laws provide for the limitation on the operator's liability and a liability ceiling, thus removing the high cost burden on smaller companies and universities to launch small satellites.

The questions of space debris and environmental issues are important in all three laws. Even though only the Austrian Space Act explicitly obliges the operator to take appropriate measures for the mitigation of space debris, the other two Laws prescribe strict environmental obligations. These cover not only the environment on Earth, but may also be used to include space debris in Outer Space. As small satellites have hardly any maneuvering capability, international space debris mitigation guidelines require a low enough orbit for such missions to that orbital lifetime after completion of operations is limited, e.g. to a maximum of twenty-five years. The near future will show if States will demand compliance with such guidelines under their national authorization scheme. If there is a broad consensus on the implementation of the guidelines, this could stimulate launch service providers to begin developing commercially attractive launch services for small satellites to bring them into sufficiently low Earth orbits.

These three national space acts attempt to reconcile drafting provisions for the safe and responsible use of outer space without inhibiting the countries' nascent space ambitions. In all three acts, a number of issues concerning authorization are left to the discretion of the authorities in order to assess the different space projects on a case-by-case basis. The laws provide for a possible preferential treatment of small satellite missions in relation to larger commercial projects. Even if the scope of application of the laws is rather broad, the administrative and financial burdens for small projects can be kept to a necessary minimum. However, and most importantly, the laws ensure that the authorities are informed about ongoing space activities and provide the basis for communication between them and the prospective space actors. This may contribute considerably to

awareness building and to qualitative improvements, including on the issues of safety and space debris.

COMPARISON OF SELECTED SPACE LAW TERMS OF ART USED IN CHINESE AND ENGLISH VERSIONS OF THE U.N. SPACE TREATIES*

*Guoyu Wang***

I. INTRODUCTION

Use, both old and new, will result in misuses.[1] This axiom applies both to outer space and language. Language and translation are the vehicles for cross-cultural communication. Translations are never produced in a cultural or political vacuum. Nor can they be isolated from the context in which the translations are made. The importance of emphasizing the differences between a source language and a target language as well as their cultural context of a translation is growing.

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* The subject of this paper was conceived when the Journal of Space Law's Editor-in-Chief, Joanne Irene Gabrynowicz, attended a 2007 workshop in which one of the Chinese participants referred to space as the "common wealth of mankind." She asked the speaker to define that term and he gave an answer that indicated he was discussing either the "province of all mankind" principle contained in the Outer Space Treaty or the "common heritage of mankind" principle contained in the Moon Agreement but was using a term contained in neither. Subsequently, Prof. Gabrynowicz again encountered the term "common wealth of mankind" in a number of official Chinese English language publications discussing Chinese space policy. When the author of this paper, Dr. Guoyu Wang visited the National Center for Remote Sensing, Air and Space Law as a visiting scholar from 2011 to 2012, Prof. Gabrynowicz told him about the "common wealth of mankind" references and asked him to compare the official English and Chinese translations of the Outer Space Treaty and the Moon Agreement. After numerous conversations it was decided by Prof. Gabrynowicz and Dr. Wang that research was in order to determine the status of the term "common wealth of mankind." Investigating these terms of art led to researching other important terms of art used in the space treaties. This paper is the result of that research and the collaborative effort of Prof. Gabrynowicz and Dr. Wang. Dr. Wang is the sole author of the paper's content. Prof. Gabrynowicz worked closely with Dr. Wang to edit his paper for language and clarity. Dr. Wang and Prof. Gabrynowicz thank PJ Blount for his assistance in the early stages of writing this paper. All translations are the unofficial translations by the author of this article.

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[1] CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 59 (Pergamon Press 1982).

This paper supports the idea of emphasizing the differences between source language and target language as well as culture when making a translation. It aims at providing insights by comparing some of the basic legal concepts used by Chinese legal professionals and Western legal professionals and seeks to eliminate some of the misunderstanding caused by translation problems. It should be stressed that comparing and analyzing space terms in the Chinese and English versions is not tantamount to further interpretation of the treaty terms nor is it a clarification of the ambiguity brought by the terms *per se*. It is, however, an endeavor to discover some of the syntactic structures and cultural elements that are intertwined with language itself which give rise to some of the misunderstandings between Chinese and Western space law professionals.

This paper addresses some of the confusion brought about by some of the terms used in several space treaties, such as the Outer Space Treaty,[2] the Liability Convention,[3] the Registration Convention,[4] and the Moon Agreement.[5] It examines both the English and Chinese versions and it suggests a reason for this confusion.

It also analyzes some significant specific terms of art related to the legal status of outer space, such as "common heritage" and "province of all mankind" and the corresponding Chinese translations in China's White Papers on space and statements made by Chinese officials. It also discusses the questions and solutions raised in connection with some terms related to responsibility and liability in space, such as "international responsibility"; "international liability"; "[being] liable for"; "absolute liability"; "procure the launching"; "a space object of launch-

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

[3] Convention on International Liability for Damage Caused by Space Objects, Mar. 29 1972, 961 U.N.T.S. 187 [hereinafter Liability Convention].

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

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

ing State"; and, "a claimant State." The paper concludes with recommendations on eliminating the confusion.

II. TERMS RELATED TO THE LEGAL STATUS OF OUTER SPACE

The legal status and character of outer space[6] is a fundamental legal question at international space law. It determines the range and nature of rights granted to, and obligations undertaken by, all Nation-States related the exploration and use of outer space. Questions related to the legal status of outer space include: is outer space the "common property" of all humankind? is it the "common heritage" of humankind? Different answers will imply different rights and obligations to explore and use outer space. However, there are no clear answers.

Art.1 of Outer Space Treaty prescribes that the exploration and use of outer space shall be the "province of all mankind." "What precisely the term "province of all mankind" is supposed to mean is not clear; the Treaty itself provides no further hint or explanation.[7]" Nevertheless, it is certain that the "province of all mankind" is not related to outer space, including the Moon and other "celestial bodies'" but to the exploration and use of outer space.[8] According to Art.11 of the Moon Agreement, the "moon and its natural resources" are declared to be the "common heritage of mankind." This principle also applies to "celestial bodies within the solar system."[9] On the one hand, there is an obvious distinction between "outer space" and the Moon "and other celestial bodies within solar system." On the other hand, the very meaning of "common heritage" is hard to define in detail until an international regime to exploit the Moon and its resources is

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[6] "Outer space in this context meaning the space lying beyond the atmosphere surrounding the Earth; the latter, commonly called 'airspace', is of course governed by the rules of air law." *See* I.H. PH. DIEDERIKS-VERSCHOOR, V.KOPAL, AN INTRODUCTION TO SPACE LAW 3-4 (Wolters Kluwer, 3d ed., 2008).

[7] *Id*. at 25.

[8] B. Maoirsky, *A Few Reflections on the Meaning and the Interrelation of "Province of All Mankind" and "Common Heritage of Mankind" Notions*, *in* 29TH PROC. COLLOQ. LAW OUTER SPACE 58-61 (1986).

[9] *See* Moon Agreement, *supra* note 5, at art. 1.

established or the exploitation "is about to become feasible."[10] Therefore, there is still no exact expression about the legal status of outer space in the Moon Agreement.

Given that the legal status of outer space is unclear in international space law, it is even more significant and, perhaps, more sensitive to define the status from the perspective of a national space law. China has no national space law. Nonetheless, some expressions related the legal status of outer space can be found in the terms of art used in official Chinese versions of space law treaties and in Chinese national space documents.

The term "common heritage" used in the Moon Agreement in Chinese is, "共同财产 (Word No.3)."[11] This means "common property" or "joint possession" in Chinese. Apparently, it does not have the exact the same meaning of "common heritage" in English[12] and therefore it is a wrongful translation. Additionally, China's White Papers of 2006 and 2011 state that "outer space is the common wealth of mankind."[13] The expression of "common wealth" also gives rise to confusion because it is not a term of art that is used in either international space law or in domestic law.

This section of the paper discusses the Chinese translation of "common heritage" used in the Moon Agreement. It also discusses the term of art related to the legal status of outer space in China's official White Papers and other statements and addresses made by Chinese officials. The author analyzes the confusion caused by the improper translation or expression and points out the improperly enlarged rights and obligations in China's national space documents. Finally, the author provides some relevant recommendations.

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[10] *See* Eileen Galloway, *Issues in Implementing the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies*, *in* 23rd PROC. COLLOQ. L. OUTER SPACE 19-24 (1980).

[11] *See* the chart, *Comparison Between the Chinese and English Texts of Different Terminologies*, *infra* Appendix [hereinafter *Chart*].

[12] Maoirsky, *supra* note 8, at 58-61.

[13] *See* China National Space Administration, *China's Space Activities in 2006*, http://www.cnsa.gov.cn/n615709/n620681/n771967/79970.html (Oct. 12, 2006), *China's Space Activities in 2011*, ENGLISH.NEWS.CN, http://news.xinhuanet.com/english/china/2011-12/29/c_131333479.htm (Dec. 29, 2011).

A. Common Heritage vs. 共同财产

One translation error is about the Chinese word, "共同财产" (Word No.3.).[14] It is the Chinese translation of "common heritage" in the Moon Agreement. The Chinese word means "common property," a concept that contains broader rights and obligations than the concept of "common heritage." The Chinese translation of "common heritage" is not a normal translation of "common heritage." Moreover, read as a Chinese word it means "joint possession" which means common ownership. So the question is did the translators intend to emphasize right and obligation of common ownership?

i. Rights and Obligations Contained in "Common Heritage" Read as Chinese Words in Different International Documents

There are three Chinese words used as the translation of the term of art "common heritage" in the international documents.

First is, "共同遗产 (Word No.4)." It means property that is inherited by all of humankind. It was contained in some international Declarations, such as the Universal Declaration on Cultural Diversity (UDCD, 2001) and the Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction (DPGSOF, 1979). Here, the Chinese word clearly means obligation to protect the "common heritage" and indicates the right to share without another's permission, except in case of a common authority, such as the International Seabed Authority.

Second is, "共同财富" (Word No.1),[15] which was also contained in the DRRP, and it refers to "culture." It is synonymous with "共同遗产 (Word No.4),"[16] but it does not emphasize the obligation

[14] *See Chart*, *supra* note 11.
[15] *See Chart*, *supra* note 11.
[16] *Id.*

as strongly as Word No.4. It should be noticed that Word No.1 is used in the Chinese White Paper of 2000, 2006, and 2011.[17]

Third is, "共同财产 (Word No.3)." It is the translation of "common heritage" in the Moon Agreement and which refers to "the Moon and its natural resources." It is also in the DRRP and refers to "civilizations and cultures."[18] In Chinese Real Right Law, Word No. 3 means "joint possession."[19] It means the limitation of the right of disposal of all co-owners.[20] On the basis of this statement, Word No. 3 as the translation of "common heritage" in the Moon Agreement clearly emphasizes right to share or use the "common heritage" and requires obtaining consent of other co-owners before performing a right of disposition.

ii. Rights and Obligations Contained in the "Common Heritage" Read as an English Word in the Moon Agreement

In the Moon Agreement, the legal meaning of "common heritage" is not yet clear. Does it mean property right in common resources? Is it declaratory in nature? Or, does it confer rights? However, what is clear that it consists of certain obligations and rights[21] and it is legally binding only on State Parties. Additionally, "common heritage" is limited to "other celestial

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[17] *See* China National Space Administration, *China's Space Activities in 2000*, *available at* http://www.cnsa.gov.cn/n615709/n620681/n771967/69198.html; China's Space Activities in 2006, *supra* note 13; and China's Space Activities in 2011, *supra* note 13.

[18] Declaration on Race and Racial Prejudice, U.N.E.S.C.O. Res. 3/1.1/2, Rec. of the Gen. Conf., 20th Sess. (Nov. 27, 1978), *available at* http://www.unrol.org/files/Declaration%20on%20Race%20and%20Racial%20Prejudice.pdf.

[19] Real Right Law of the People's Republic of China (Adopted at the 5th session of the Tenth Nat'l People's Cong., Mar.16, 2007), *available at* http://wenku.baidu.com/view/9d9dc30a79563c1ec5da7123.html.

[20] *Id.* at art 97 ("As regards the disposal or heavy repair of a commonly owned realty or chattel, unless it is stipulated otherwise by the co-owners, the consent of the several co-owners holding 2/3 shares or all joint owners shall be obtained").

[21] "All activities on the Moon, including its exploration and use, shall be carried out in accordance with international law . . . with due regard to the corresponding interests of all other States Parties." *See* Moon Agreement, *supra* note 5, at art. 2. "[T]he moon shall be used by all states parties exclusively for peaceful purposes." *Id.* at art. 3.

bodies within the solar system,"[22] and does not extend to the whole of outer space.

The author's view is that the Moon Agreement describes obligations more clearly than it describes conferred rights. Therefore, the term of art "common heritage" in the Moon Agreement, likely emphasizes obligations more than rights.[23] However, the Chinese translation of "common heritage" in the Moon Agreement, when read in Chinese, means "joint possession." This includes both the right of ownership as well as the obligation of obtaining permission from other co-owners before exercising the ownership right. As corresponding rights and obligations are not equally described in the Moon Agreement, the Chinese translation which does describe rights and obligations equally, improperly enlarges the rights and obligations described in the Moon Agreement. This is due to the improper translation and the vagueness of the very concept of "common heritage of mankind."

iii. Suggestions to Eliminate Misunderstanding: a Proper Chinese Translation of "Common Heritage of Mankind" in Moon Agreement

The author's suggestion is to use different Chinese words to translate "common heritage" instead of Word No. 3. One choice is Word No. 4 "共同遗产." It has been used in several international documents[24] and in the work of Chinese space lawyers.[25]

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[22] "The provisions of this Agreement relating to the Moon shall also apply to other celestial bodies within the solar system, other than the earth, except in so far as specific legal norms enter into force with respect to any of these celestial bodies." *Id.* at art. 1(1).

[23] *Id.* at art. 1(3) & art. 4.

[24] Word No. 4 can be found as the translation of "common heritage" in the Chinese version of UNESCO Declaration on Cultural Diversity, Nov. 2, 2001, UNESCO Doc. 31C/RES/25, *available at* http://portal.unesco.org/en/ev.php-URL_ID=13179&URL_DO=DO_TOPIC&URL_SECTION=201.html, and its Chinese version is available at http://www.un.org/chinese/hr/issue/docs/62.PDF. Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction, G.A. Res. 2749, U.N. GAOR Supp. (No. 28) at 24, U.N. Doc. A/8028 (1970), reprinted in 10 I.L.M. 220 (1971), and its Chinese version available at: http://www.un.org/ga/search/view_doc.asp?symbol=A/RES/2749(XXV)&referer=http://search.un.org/search?q=A/RES/2749%20(XXV)&Lang=C.

[25] *See* Yongping Ge, *Study on the Relation between the Principle of "Common Heritage of Mankind" and the Other Relative Principles*, 11 HEIBEI LAW SCIENCE (2007); Lei

In Chinese, this word is read to emphasize the obligation to protect more than right to explore. Due to the vagueness of the term "common heritage" in the Moon Agreement the relative relationship between rights and obligations cannot be assumed. Therefore, using a definition that is used in similar legal documents and in practice makes sense.

Another choice is Word No.1 "共同财富." This word considers both the right to explore and obligation to protect. This word emphasizes the obligation a little more than the right. Arguably, it might be closer to the real intention of the Moon Agreement. Additionally, Word No.1 is exactly the same Chinese word used in the 2000, 2006, and 2011 White Papers on outer space.[26] This could give rise to a misunderstanding that China's position on "common heritage" is the same position that is contained in the Moon Agreement. However, China it is not a party to the Moon Agreement therefore is would be the wrong conclusion.

B. "Common Wealth" vs. "共同财富"

Another translation error and an improper Chinese expression is found in China's White Papers on space and other official statements as well as addresses made by Chinese officials. Moreover, the improper translation contained in the English version of China's 2006 White Paper is repeated in the 2011 White Paper, demonstrating that the error has been perpetuated. Like the older documents, the 2011 White Paper states that "outer space is the common wealth of mankind."[27] The meaning of "common wealth" causes unnecessary confusion. Does it mean China asserts that "outer space" is the "joint possession" of humankind? Does it mean China's position is that the right to explore and use outer space should be based on the consent of all humankind? Both are incorrect.

Cao, *Identify the Private Ownership of Celestial Bodies on the Basis of the "Common Heritage of Mankind" Principle*, 3 J. OF XIANGFAN VOCATIONAL AND TECHNICAL COLLEGE (2009).

[26] *See* China's White Paper in 2000, 2006, and 2011, *supra* note 17.

[27] *Id.*

The Chinese word, which is used in the both White Papers, is "共同财富 (Word No.1.)."[28] In Chinese, it means both having the right to share things and having an obligation to protect them. This should be translated into "common heritage" but not "common wealth." Therefore, "common wealth of mankind" in China's White Papers should not be taken as "joint possession of mankind," but as "common heritage of mankind" as in the Moon Agreement. It is a translation error. However, as previously stated, China is not a party to the Moon Agreement. Therefore, it is improper for China to hold the same position contained in the Moon Agreement in a Chinese national space document. Therefore, it is an improper expression. Even if China was to become a Party to the Moon Agreement in the future, it is still incorrect to say "outer space is the common heritage of mankind," because the object of "common heritage of mankind" shall be limited within "solar system." In conclusion, the rights and obligations of Nation-States related to exploration and use of outer space are improperly enlarged both in China's 2006 and 2011 White Papers.

On one hand, the author's suggestion is to use other Chinese words like "共同遗产 (Word No. 4)"[29] or "共同财富 (Word No. 1)" instead of "共同财产 (Word No. 3)" as the Chinese translation of "common heritage" in the Moon Agreement. On the other hand, considering China is a Party of the Outer Space Treaty, the author suggests changing "outer space is the common wealth of mankind" to "the exploration and use of outer space shall be the province of all mankind" in the China's White Papers.

The White Papers were enacted by the Information Office of State Council. As such, it must be noted that the papers are government policy documents without legal effect. As mentioned above, the White Papers used Word No.1 "共同财富" to describe the legal status of outer space. In Chinese law, Word No. 1 "共同财富" is not a legal term. Its use gives rise to the question of whether there is a legal meaning of this Chinese word and its translation as "common wealth." Moreover, its use also gives

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[28] *See Chart*, *supra* note 11.
[29] *Id.*

rise to the question as to what the relationship is between the Chinese word, the translation, and relevant space treaty terms of art, such as "common heritage" and "province of all mankind."

i. "Common Wealth" in China's 2006 and 2011 White Papers

As to the legal status of outer space, the 2006 and 2011 White Papers declare:

> China is unflinching in taking the road of peaceful development, and always maintains that outer space is the *common wealth of mankind*. While supporting all activities that utilize outer space for peaceful purposes, China actively explores and uses outer space and continuously makes new contributions to the development of man's space programs.[30]

> The Chinese government holds that outer space is *the common wealth of all mankind*, and each and every country in the world enjoys equal rights to freely explore, develop and utilize outer space and celestial bodies; and that all countries' outer space activities should be beneficial to the economic development, social progress of nations, to security, subsistence and development of mankind, and to friendly cooperation between people of different countries.[31]

> Outer space is *the common wealth of mankind.* Exploration, development and utilization of outer space are an unremitting pursuit of mankind. Space activities around the world have been flourishing. Leading space-faring countries have formulated or modified their development strategies, plans and goals in this sphere. The position and role of space activities are becoming increasingly salient for each active country's overall development strategy, and their influence on human civilization and social progress is increasing.[32]

The same expression is used in statements and addresses made by Chinese officials when regarding disarmament issues: "[t]he outer space is the common wealth of mankind as the

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[30] *China's Space Activities in 2006*, *supra* at 13, at Preface (emphasis added).
[31] *Id*. at V. "International Exchanges and Cooperation" (emphasis added).
[32] *China's Space Activities in 2011*, *supra* at 13, at Preface (emphasis added).

global public space. The permanent peace of outer space is correlated to all nations' security, development and prosperity."[33]

ii. "Common Wealth" Defined as an English Word

When "common wealth" is read as one word in English, it means "a nation, state, or other political unit."[34] However, when read as two words, its legal meaning is unclear. According to the Black's Dictionary, "common" means "a legal right to use another person's property, such as an easement"[35] and "wealth" means "1. a large quantity of something. 2. the state of having abundant financial resources; affluence."[36]

Therefore, the use of "common wealth" as two words in China's White Paper causes some confusion. Does it mean China asserts that outer space is "property" having abundant resources that can be legally used by others? That is, a joint possession? Does it mean China's position is that the right to explore and use outer space should be based on the consent of all humankind? If the answers are in the affirmative, the rights and obligations that are being addressed are definitely improperly enlarged.

iii. "Common wealth" Read As Different Chinese Words

There are two Chinese words used to translate "common wealth." "共同财产 (Word No. 3)" means "joint possession," and

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[33] Qun Wang, Chinese Ambassador for Disarmament Affairs, Conference of the First Committee of the UN General Assembly (Oct. 17, 2011), *available at* http://www.fmprc.gov.cn/eng/wjb/zzjg/jks/kjfywj/t869579.shtml. Director-General Liu, Reception at the U.S. Sandia National Laboratories for International Arms Control Year: Enhancing International Cooperation and Safeguarding World Security (April 25, 2002); H.E. Yang Jiechi, Minister of Foreign Affairs of the People's Republic of China, Conference on Disarmament (Aug. 12, 2009); and H.E. Mr. WU Haitao, Ambassador for Disarmament Affairs of China, at the General Debate of the First Committee of the 67th Session of UN General Assembly (Oct. 12, 2012) *available at* http://www.fmprc.gov.cn/eng/wjb/zzjg/jks/jkxw/t978468.shtml. *See also* Ministry of Foreign Affairs of the People's Republic of China, *China's Endeavors for Arms Control, Disarmament and Non-Proliferation* (Sept. 5, 2005), *available at* http://www.fmprc.gov.cn/eng/wjb/zzjg/jks/jkxw/t209613.shtml.

[34] BLACK'S LAW DICTIONARY 315 (9th ed. 2009).

[35] *Id.* at 311.

[36] *Id.* at 1730.

the word used in the White Papers is "共同财富 (Word No. 1)." As mentioned above, Word No. 1 is also used as a translation of "common heritage" in international documents. When read as a Chinese word, it means the right to share things and an obligation to protect them. For example, one Chinese top legislator called the Olympic Movement a "common wealth of mankind."[37] Obviously, it does not necessarily mean humankind owns the Olympic movement. Nor does it mean that humankind must give permission for China to share the Olympic Movement. Further, when compared with the relevant space treaty terms, word No.1 "共同财富", which is used in the White Papers, is also not a proper term.

iv. Legal Meaning of "Common Wealth" in China's White Paper and Its Relationship to Relevant Treaty Terms

The White Paper Word No. 1 "共同财富" and the term of art "common heritage" have almost the same legal meaning: the obligation to protect and the right to explore and use. However, as previously mentioned, China is not a party to the Moon Agreement. Therefore, it is improper for China to hold the position that is contained in the Moon Agreement in its national space document. Furthermore, the White Paper declares that the concept of "common wealth" applies to all of outer space. However, according to Art. 1 of the Moon Agreement, "common heritage" "appl[ies] to other celestial bodies within the solar system." Therefore, the rights and obligations described in White Paper are broader than those contained in the Moon Agreement.

As the Soviet negotiator[38] for the space treaties and others[39] have stated, the "common heritage of mankind" is not equal to

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[37] "China's top legislator Wu Bangguo called the Olympic Movement a 'common wealth of mankind' here on Monday, while addressing the opening of the 16th general assembly of the Association of National Olympic Committees." *See Top legislator hails Olympic Movement as common wealth of mankind*, CHINA VIEW (Apr. 7, 2008) http://news.xinhuanet.com/english/2008-04/07/content_7935930.htm.

[38] *See* Maoirsky, *supra* note 8.

[39] "The Workshop agreed that the principle of 'common heritage of mankind' in the Moon Agreement and the principle of 'province of all mankind' in the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (General Assembly resolution 2222 (XXI),

"province of all mankind." Therefore, the term of art "common heritage," as used in the White Paper Word No. 1 is also not equal to "province of all mankind."

The translation of "province of all mankind" is "(人类)共同事情 (Word No.2)." Both terms focus on the right to explore and use outer space, not on outer space *per se*. The White Paper Word No. 1 "共同财富" also means the obligation to protect. So in some sense, it is broader than "province of all mankind" and could incorporate it. However, as a party to Outer Space Treaty, China should not broaden the scope of the principle contained in the Outer Space Treaty.

v. Conclusions Regarding the White Paper

"Common wealth" in China's White Paper should not be interpreted as a "joint possession," but rather as the term of art "common heritage of mankind" that is contained in the Moon Agreement. However, because China is not a State party to the Moon Agreement but is a State party to the Outer Space Treaty, the rights and obligations as described in the White Paper are improperly enlarged. Even if China was to become a party to the Moon Agreement in the future, it is still incorrect to say that "outer space is the common heritage of mankind," because the object of the "common heritage of mankind" principle in the Moon Agreement is applicable only as far as the celestial bodies in the solar system. In the view of this, the rights and obligations as described in White Paper are broader than those in the Moon Agreement.

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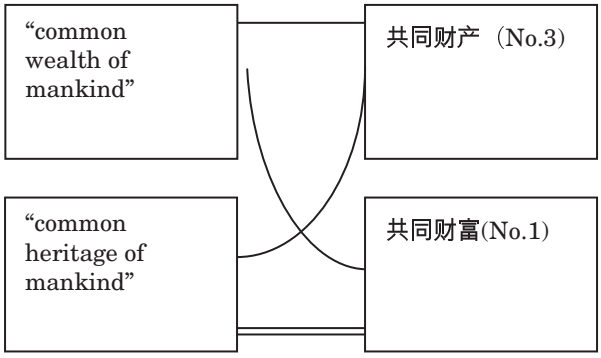
annex) were two different principles." PROCEEDINGS, UNITED NATIONS/BRAZIL WORKSHOP ON SPACE LAW: DISSEMINATING AND DEVELOPING INTERNATIONAL AND NATIONAL SPACE LAW: THE LATIN AMERICA AND CARIBBEAN PERSPECTIVE 401, UN OOSA, ST/SPACE/28 (2005), http://www.oosa.unvienna.org/pdf/publications/st_space_28E.pdf.

As to the reasons, first, the misunderstanding is caused by the mismatched translations. The chart below shows the translation relationship between the English term of art and the Chinese term of art in the White Paper and the Moon Agreement. The curved lines show the current incorrect translation relationship. The straight lines show the correct one.

Second, the White Paper drafters erred in equating the "province of all mankind" principle contained in the Outer Space Treaty with the "common heritage of mankind" principle contained in the Moon Agreement.



vi. Recommendations to Eliminate the Misunderstandings: Use Proper Terms of Art in China's Next White Paper

First, translate Word No.1 "共同财富" used in the 2006 and 2011 White Papers into the English term of art "common heritage of mankind." This term of art represents the real intention of the White Paper drafters, not "common wealth." However, changing the word itself is still not enough to correct the misunderstandings, because China is not a Moon Agreement Party. If the term of art "common heritage" is used, then it is still necessary to change "outer space" to "other celestial bodies within the solar system." Therefore, this is not a good choice.

It is further recommended that the term of art "the exploration and use of outer space shall be the province of all mankind" be used instead of the term "outer space is the common wealth of mankind." The drafters of the next White Paper should not

try to define the character of materials in space or the character of outer space itself. Rather they should emphasize that it is the "exploration and use of outer space" that "shall be the province of all mankind." This approach focuses on the activities, not space or the materials located there. This choice is in keeping with the current status of international space law and the due international obligations of China.

III. TERMS RELATED TO RESPONSIBILITY AND LIABILITY

A. International Responsibility and International Liability vs. 国际责任

Commentators have noticed the use of different terms of art in the official texts of the Outer Space Treaty. Most notably between the use of "liability" in English as against the use of "responsibility" in the Chinese, French, and Spanish versions. They argue that "[. . .] this distinction may be attributed in part to differing legal traditions; it does not detract from what was intended by the drafters of the Outer Space Treaty to impose a clear obligation on a State to control and be answerable, even liable under international law, for its national space activities."[40] However, in fact, there is confusion caused by the translation problems.

i. Confusion Regarding the Chinese Translation of "International Responsibility" and Suggestions for Clarification

International responsibility by States for non-governmental entities is codified in Article VI of Outer Space Treaty:[41]

> "States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in con-

[40] Stephen Hobe, et al., COLOGNE COMMENTARY ON SPACE LAW, VOL. 1 "OUTER SPACE TREATY" 129 (Carl Heymannds Verlag, 2009).

[41] The similar expression also can be found in Article 14 of Moon Agreement. *See* Moon Agreement, *supra* note 5, at art. 14.

> formity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty."

a. The Chinese Word for "Responsibility" and the Confusion Regarding It, per se

When the term of art "responsibility" in Article VI is read as the Chinese word "责任," it has two meanings:[42] the first is "obligation/duty" and the second is "responsibility" that is deemed to be the legal consequences[43] triggered by the violation of an obligation/duty or damage.[44] In Chinese, when it is said that "a government shall be responsible for its people," it means a government has the specific obligation/duty of taking care of its people. It does not mean that the government shall bear the legal consequences caused by the violation of an obligation/duty. In this situation, "责任" means "obligation." In French, the situation is the same: "[T]he French word 'Responsabilité' has two meanings. When the little Prince of Antoine de Saint Expuéry writes that he is 'responsable de sa rose' (responsible for his rose), it does not only mean that the Prince is liable, but that he is responsible i.e. that he has to take care of his rose. "[45] This kind of expression can be found in some Chinese laws as well. For example, in Article 133 of Chinese Civil Law, it is provided that "[i]f a person without or with limited capacity for civil conduct

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[42] In fact, in the expression of "being responsible for," or "responsibility," in Chinese has a third meaning: taking charge of. This will be specifically discussed in Section IV of this article.

[43] Legal consequences mean the obligations such as making reparation, continued duty of performance, cessation and non-repetition, etc. This will be discussed in more detail later in the article.

[44] It almost gets to the consensus in Chinese legal academic circles that there are general legal obligations and special legal obligations and the latter is a consequence of violation of the former. The latter is called "responsibility" and the former is called "obligation/duty". *See* ZHANG WENXIAN, RESEARCH ON THE CATEGORIES OF LEGAL PHILOSOPHY 122 (China University of Political Science and Law Press, 2001).

[45] Armel Kerrest, *Remarks on the Responsibility and Liability for Damage Caused by Private Activity in Outer Space, in* 40TH PROC. COLLOQ. L. OUTER SPACE 134,135 (1997).

causes damage to others, his guardian shall bear civil liability. If the guardian has done his duty of guardianship, his civil liability may be appropriately reduced."[46] In this text, the words "duty" and "liability" are translated with the same Chinese word, "责任."

Apparently, in Chinese, using one word "责任" to express two totally different meanings, i.e. "obligation" and "legal consequences" causes confusion. Even for a Chinese reader, he or she has to define the exact meaning of this word according to the specific context. Some Chinese commentators have argued that in order to eliminate the confusion, different words should be used separately, i.e. "义务" should be used as "obligation," and "责任" should only be used to express "legal consequence" in the case of occurring damage or the violation of obligation.[47]

b. Confusion Regarding the Chinese Translation of "国际责任" as "International Responsibility" in Article VI of Outer Space Treaty on a Basic Level

To a Chinese reader, the Chinese word "国际责任" as the translation of "international responsibility" in Article VI of the Outer Space Treaty could be interpreted two ways. One is an "international obligation/duty" and the other is the "international legal consequence" in case of violation of an international obligation or existence of damage. The question is which one of these two understandings provides the real intention of the drafters of Outer Space Treaty?

"The term 'responsibility,' derived from the Latin *respondere* (to answer), means primarily answerability or accountability. At the most basic level, in the present context, it can mean

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[46] Civil Law of the Peoples Republic of China (promulgated by Order No. 37 of the President of the People's Republic of China on April 12, 1986, and effective as of January 1, 1987), *available at* http://www.chinalawedu.com/news/23223/23228/9304.htm.

[47] Baoyu Liu & Binbin Zhou, *Reconsideration on the Division of Civil Liability and Duty*, 4 J. OF POL. SCI. & L 32-37 (2009) 32-37, *available at* http://www.civillaw.com.cn/article/default.asp?id=46660 ("[C]ivil liability should be defined as the legal consequence that the party definitely violating civil duty or under special regulations otherwise has to shoulder.").

simply authorship of an act or omission."[48] Assuming that statement is correct, then strictly speaking, neither of the two meanings of the Chinese translation of "国际责任" as "international responsibility" exactly provides the original intention of the drafters. However, in Chinese, it is hard to find a term as the translation of "[bearing] international responsibility" to express "authorship of an act or omission."

In contrast, it is the author's point of view that the first meaning of the Chinese translation, i.e. "international obligation" is much closer to the real intention of the drafters. According to Article VI, a State shall bear international responsibility for its national activities. However, a State is not supposed to bear the legal consequence of its national activities that are consistent with international law. Moreover, Article VI indicates "international responsibility" could be fulfilled by meeting specific international obligations such as "assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty," by exercising "authorization and continuing supervision" of "the activities of non-governmental entities in outer space." These expressions can be taken to support the view that to bear "international responsibility" actually means to bear international obligations during a State's national activities in outer space.

c. The Legal Consequence of Confusion Regarding the Chinese Translation of "国际责任" as "International Responsibility" in Article VI of Outer Space Treaty

The next question is if a State contravenes its obligations contained in Article VI, what is the legal consequence? When "international responsibility" is read as the Chinese word "国际责任" in international law, it also has two meanings. One is that the State's responsibility arose by an internationally wrongful act or omission, i.e. fault liability. The other is that strict liability arose by either an internationally wrongful act or

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[48] BIN CHEN, STUDIES IN INTERNATIONAL SPACE LAW 603 (Clarendon Press 1997).

a non-prohibited act in the case of occurring damage.[49] However, according to "Draft Articles on Responsibility of States for Internationally Wrongful Acts,"[50] every internationally wrongful act of a State entails the international responsibility of that State, i.e. the State's responsibility. Therefore, when considering legal consequences the term of art "international responsibility" contained in Article VI refers to a State's responsibility. If this is correct then the Chinese translation of "international responsibility" should change from "国际责任" to "国家责任," which means "State's responsibility."

However, whether a State without fault is responsible for its national activities in outer space is still an open question. On one hand, considering that Article II and Article III of the Liability Convention are based on Article VII of Outer Space Treaty and that Article VII of the Outer Space Treaty is a logical consequence of Article VI of that same treaty, then the absolute liability contained in Article II of Liability Convention should also be included in Article VI of Outer Space Treaty. Furthermore, it seems to run counter to the integrity of the several space conventions as a whole, if a State does not bear absolute liability for its national activities in the case of causing damage on Earth or to an aircraft in flight. Besides, as one commentator points out "[i]n keeping with the 1963 Declaration, Article VII is not explicit about liability beyond its general provision."[51] The above arguments could be taken to defend the position that "international responsibility" in Article VI should

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[49] LI SHOUPING, GAOLING, LIBIN, TEXTBOOK OF INTERNATIONAL LAW 217 (University of International Business and Economics Press, 2007).

[50] *See* the text adopted by the Commission at its fifty-third session, in 2001, and submitted to the General Assembly as a part of the Commission's report covering the work of that session. United Nations, *Draft Articles on Responsibility of States for Internationally Wrongful Acts* (2001), *available at* http://untreaty.un.org/ilc/texts/instruments/english/commentaries/9_6_2001.pdf. The report, which also contains commentaries on the draft articles, appears in II YEARBOOK OF THE INTERNATIONAL LAW COMMISSION (2001), at Part Two. The text is reproduced in Responsibility of States for Internationally Wrongful Acts, G.A. Res 56/83, U.N. GAOR, 56th Sess., U.N. Doc. A/RES/56/83 (Jan. 28, 2002), *corrected by* U.N. Doc. A/RES/56/49(Vol. I)/Corr.4, at art. 1.

[51] *See* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 136.

include fault liability/State's responsibility and absolute liability. As such, the present Chinese translation of "international responsibility" is correct.

On the other hand, the view that "international responsibility" refers only to a State's responsibility/fault liability might find new support in Article VI *per se*, in addition to support from general practice. Article VI stipulates "States Parties to the Treaty shall bear international responsibility for national activities *in outer space*."[52] If "*in outer space*" is strictly interpreted, it means that the international responsibility for national activities on the ground or in air space will not be considered, and as a logical result, absolute liability will also not be considered. In the author's view, it is inappropriate to interpret "*in outer space*" so strictly as it narrows the scope of Article VI, which is supposed to be the most fundamental clause related to the international responsibility regime in space law. Further, if the "international responsibility" for national activities in outer space should be the State's responsibility, then the Chinese translation is improper in that it enlarges the scope of responsibility in Article VI.

d. Suggestions for Clarification

When obligations rather than legal consequences are addressed, "义务" should take the place of "责任"; therefore, changing the Chinese translation of "international responsibility" from the present "国际责任" to "国际义务" is encouraged. However, if only legal consequences are addressed, then the present translation is appropriate.

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[52] Outer Space Treaty, *supra* note 2, at art. VI (emphasis added).

ii. Confusion Regarding the Chinese Translation of "国际责任" as "international liability" in Article VII of Outer Space Treaty[53]

Article VII of Outer Space Treaty imposes international liability for the act of launching a space object,[54] as the legal basis for international claims for compensation. It has been expanded with details through the specific rules in the Liability Convention, notably Article II and Article III. Article VII of Outer Space Treaty reads:

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

In the Chinese version, the same word "国际责任" as the translation of "international responsibility" in Article VI is also used as the translation of "internationally liable/international liability." Therefore, it inevitably causes misunderstanding that "international responsibility" in Article VI is the same as the "international liability" in Article VII. Moreover, regardless of the differentiation between international responsibility and international liability, the Chinese translation of "international liability" in Article VII *per se* is not appropriate either.

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[53] In fact, in the Chinese version, the translations of "bear international responsibility" and "[be] internationally liable for" are the same, which are both "承担国际责任." In order to make it much clearer, the author only compared between the Chinese translation of "international responsibility" and of "international liability," which will not affect the real intention of the Outer Space Treaty.

[54] C.Q. Christol, *International Liability for Damage Caused by Space Objects*, 74 Am. J. of Int'l L. 346, 354 (1980).

a. The Differentiation between International Responsibility and International Liability

To an English reader, the international responsibility referred to in Article VI is totally different from the international liability referred to in Article VII.

The object and scope of responsibility is different from that of liability. Article VI is a general rule of responsibility for national activities, whereas Article VII is a general rule of liability for space objects. "The responsibility of States for national activities must be strictly differentiated from the liability of States for damages caused by a space object according to Article VII: responsibility is borne for activities... whereas liability is attributed to the State(s) involved in the launching of a space object."[55]

Furthermore, the pre-conditions of liability and responsibility are dissimilar. The core pre-condition of international liability in Article VII is the existence of "damage." Whereas the core pre-condition of international responsibility in Article VI is the internationally wrongful act or omission of a State, i.e. the violation of an international obligation. Article VII imposes liability for damage caused by space objects, irrespective of the location of damage.[56] In contrast, Article VI stipulates the international responsibility that will be triggered by a State when it contravenes international obligations related to a State's national activities, such as the obligation of authorizing and continuously supervising the activities of non-governmental entities. "Although the terms "authorization" and "continuing supervision" are open to different interpretations, it would appear that Article VI requires a certain minimum of licensing and enforced adherence to government-imposed regulations."[57] Article VI also sets up the obligation of a State to assure its national activities are carried out in conformity with the provisions set

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[55] *See* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 104.

[56] Armel Kerrest, *Liability for Damage Caused by Space Activities*, *in* MARIETTA BENKÖ & KAI-UWE SCHROGL (EDS), SPACE LAW: CURRENT PROBLEMS AND PERSPECTIVES FOR FUTURE REGULATION 91 ff, 101 (Eleven, Utrecht 2005).

[57] GLENN H. REYNOLDS & ROBERT P. MERGES, OUTER SPACE: PROBLEMS OF LAW AND POLICY 74 (Westview Press, 1997).

forth in the Outer Space Treaty, as stated above. If a State contravenes this obligation, it shall bear the corresponding international responsibility as well. Therefore, the international obligations *per se* are not equal to international responsibility.

Additionally, bearing responsibility and bearing liability take different forms. Liability in international law indicates the legal duty to make reparation for the damage caused by breach of a legal duty or obligation.[58] In Article VII, the obligation to provide compensation is a clear response to the ultra hazardous nature of launching activities.[59] Also, the traditional definition of international responsibility is limited to the obligation to make reparation.[60] However, with the development of international law, as to responsibility, it is far from being accepted that damage is its fundamental basis or source.[61] As mentioned above, "damage" is not the pre-condition for a State to be internationally responsible for its national activities in outer space. Therefore, bearing international responsibility under Article VI takes various forms, including making reparation, continued duty of performance, cessation and non-repetition etc. Furthermore, if a State does not fulfill its obligation of authorization or continuing supervision, it shall bear the corresponding international responsibility, even if no damage occurred at that point.

In sum, international responsibility and international liability are different. "This differentiation is of special importance in respect of the wording of Article VI and Article VII in those authentic Treaty languages that use the same term for the two different concepts of 'responsibility' and 'liability.' This is the case in the Chinese ('责任' in both articles), French (in both articles), and Spanish ('responsabilidad' in both articles) texts

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[58] *See* Bin Cheng, *International Responsibility and Liability for Launch Activities,* 20 AIR & SPACE L. 300 (1995).

[59] *See* Bin Cheng, *Article VI of the 1967 Space Treaty Revisited: "International Responsibility", "National Activities" and "The Appropriate State,"* 26 J. SPACE L. 7, 9 (1998).

[60] JAMES CRAWFORD, ET AL., THE LAW OF INTERNATIONAL RESPONSIBILITY 5 (Oxford University Press, 2010).

[61] *Id*.

which are equally authentic according to Article XVII paragraph."[62]

b. Confusion Regarding the Chinese Translation of "[Being] Internationally Liable For"

In the case of a breach of a legal rule causing damage to another, legal responsibility entails a legal obligation incumbent on the author of the breach to make integral reparation to the victim for the damage so caused in order to restore the position to what it probably would have been had the breach not taken place.[63] As stated above, liability in international law indicates the reparation obligation.[64] That obligation to provide compensation is a clear response to the ultra hazardous nature of launching activities.[65]

The appropriateness and accuracy of the Chinese translation of "国际责任" as [being internationally liable for]/international liability in Article VII should be carefully examined. As stated above, this Chinese word means both fault liability and absolute liability. Some commentators point out that, "in itself, Article VII cannot be regarded as asserting the principle of absolute liability. It is merely the logical consequences of Article VI."[66] Therefore, it seems that the Chinese word "国际责任" should be taken as "国家责任," which means "State's Responsibility." This is not the case. After all, a term of art, as well as a treaty, should be read or interpreted as a whole. "While Article VII provides the legal basis to international claims for compensation details and categories of liability and damage have been expanded within the special rules of the LIAB,"[67] notably Article II and Article III, which clearly separate absolute liability and fault liability. From this perspective, the existing Chinese trans-

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[62] *See* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 104.

[63] *See* Factory at Chorzow (Ger. v. Pol.), Indemnity, 1928 PCIJ (ser. A) No. 17, pp. 29 & 47.

[64] *See International Responsibility and Liability for Launch Activities*, *supra* note 58, at 300.

[65] *See Article VI of the 1967 Space Treaty Revisited*, *supra* note 59, at 9.

[66] *See* STUDIES IN INTERNATIONAL SPACE LAW, *supra* note 48, at 238.

[67] *See* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 142.

lation of international liability in Article VII of Outer Space Treaty appears to be acceptable. However, the Chinese word that is used can also mean many other forms of bearing international responsibility, except for "[being] liable for." Therefore, the present Chinese translation enlarges the scope of the forms of bearing responsibility in Article VII.

c. Suggestion for Clarification: The Proper Translation of "[Being] Liable for"

The author suggests using the Chinese word "国际赔偿责任." It means "compensation liability" or "international liability" and ought to replace "国际责任" for the translation of "[being] internationally liable for."

B. Absolute Liability vs. 绝对责任

i. Absolute Liability in International Space Law

Article II of the Liability Convention imposes absolute liability for damage that takes place on the surface of the Earth:

> A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft in flight.

Absolute liability in tort is for ultra-hazardous or abnormally dangerous activities.[68] Black's Law Dictionary refers to the definition of "strict liability" when it defines "absolute liability" as "liability that does not depend on actual negligence or intent to harm, but that is based on the breach of an absolute duty to make something safe."[69] Therefore, absolute liability, including in space law, can be triggered by both a State's non-prohibited act and a wrongful act.

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[68] *See* James R. MacAyeal, *The Comprehensive Environmental Response, Compensation, and Liability Act: the correct paradigm of strict liability and the problem of individual causation*, *18* UCLA J. ENVTL. L. & POL. 217, 218 (1999-2001).

[69] BLACK'S LAW DICTIONARY, *supra* note 34, at 997, 998.

ii. Absolute Liability in Chinese Civil Law

According to Chinese tort Law, if any person causes damage to other people by engaging in operations that are greatly hazardous to the surroundings, he or she shall bear civil liability whether or not he or she is at fault. Such operations include those conducted high aboveground; those involving high pressure, high voltage, combustibles, explosives, highly toxic or radioactive substances; or high-speed means of transport.[70] It is no doubt that the liability system in space law is consistent with the Chinese tort law system.

iii. Confusion Regarding Exoneration

According to the Chinese tort law, some degree of exoneration shall be granted to the transgressor when damage is caused by the intent of a victim or a third party; the result of a *force majeure*; by reasonable self-defense; or by avoiding danger. If these circumstances exist, some degree of exoneration will be granted whether the event involves absolute liability or fault liability.[71] Similar grounds for exoneration from liability have been recognized under treaty practice, in judicial decisions, and by State practice unrelated to treaties.[72]

The principle of exoneration is also codified in the Liability Convention. Under Article VI of Liability Convention, if the launching State proves that the damage caused to the claimant State was wholly or partly the result of gross negligence or of an act or omission of the claimant or its nationals with intent to cause damage, the launching State will be exonerated from liability. However, there is no exoneration where the damage has

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[70] Tort Law of the Peoples Republic of China (promulgated by the Standing Comm. Nat'l People's Cong., Dec. 16, 2009, effective July 1, 2010), at arts. 69-77, *available at* http://wenku.baidu.com/view/fb60eb4bc850ad02de8041c6.html.

[71] *Id.* at arts. 26-31.

[72] International Law Commission, *Survey of Liability Regimes Relevant to the Topic of International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law (International Liability in Case of Loss From Transboundary Harm Arising Out of Hazardous Activities)*, 143-153, U.N. Doc. A/CN.4/543 (2004), *available at* http://untreaty.un.org/ilc/sessions/56/56docs.htm.

resulted from activities conducted by a launching State that are not in conformity with international law.[73]

When compared to general practice in domestic law and international law, Article VI grounds for exoneration appear to be narrower. Exoneration is granted only when damage is caused as a result of gross negligence or by an intentional act or omission of the claimant or its nationals. This gives rise to questions regarding other grounds for exoneration. For example is *force majeure* or reasonable self-defense excluded? Further if other grounds at international law or customary law are otherwise applicable, are they available for purposes of this Article?

Article VI stipulates only exoneration from absolute liability. It does not address exoneration from fault liability. This is inconsistent with Chinese tort law where exoneration can be granted in situations involving either fault liability or absolute liability. Therefore, that article brings confusion to Chinese readers. According to that article if a launching state or the persons it is responsible for have fault, and then cause damage to the space object or the persons on board of another launching state, it cannot be granted the exoneration from fault liability, even if the damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State or of natural or juridical persons it represents. Is it reasonable?

From the perspective of a transgressor, the application of absolute liability is harsher than the application of fault liability where there is an opportunity to mitigate potential sanc-

[73] Article VI of the Liability Convention provides for exoneration:

> 1. Subject to the provisions of paragraph 2 of this article, exoneration from absolute liability shall be granted to the extent that a launching State establishes that the damage has resulted either wholly or partially from gross negligence or from an act or omission done with intent to cause damage on the part of a claimant State or of natural or juridical persons it represents.
>
> 2. No exoneration whatever shall be granted in cases where the damage has resulted from activities conducted by a launching State which are not in conformity with international law including, in particular, the Charter of the United Nations and the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies.

See Liability Convention, *supra* note 3, at art. VI.

tions. Therefore if exoneration can be granted to States that face the harsher liability, ought not it be available to a State facing a less harsh application of liability under the same conditions? In other words, it is unjust to have a launching State bear the whole fault liability for damage caused by the gross negligence or intent of the victims.

Article VI can be supported by the position that space activity is ultra-hazardous. Therefore the Liability Convention is victim-oriented by focusing on the responsibility of the launching state and provides maximum protection for potential victims.[74] Exoneration could be granted only when the launching State has no fault. For that reason, it could be granted to a State only when it bears absolute liability for damage on Earth or to aircraft in flight but not to a State whose fault causes damage elsewhere.

C. "Procures the Launching" vs. 促使发射

The term of art, "procures the launching"[75] is a key to defining a "launching State." It is also relevant to defining the subject of international responsibility and liability in space law. Although there has been much discussion as to the precise meaning of "procures the launching," it is still remains an open question without consensus. The Chinese translation of "procures the launching" as used in Art.VII of Outer Space Treaty[76] may be of some assistance in interpreting "procures the launching" for purposes of the Liability Convention..

The following discussion is premised on the fact that "a State which procures the launching" is deliberately different from "a State which launches."[77] The logic of this article shows the relationship between them. Additionally, it must be recog-

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[74] *Liability for Damage Caused by Space Activities*, *supra* note 56, at 91ff.

[75] Liability Convention, *supra* note 3, at art. I (c)(i).

[76] "[P]rocure the launching" could also be found in Article I of Liability Convention and Article I of Registration Convention. *See* Liability Convention, *supra* note 3, at art I; and Registration Convention, *supra note* 4, at art I.

[77] *See* Bernhard Schmidt-Tedd & Michael Gerhard, *How to Adapt the Present Regime for Registration of Space Objects to New Developments in Space Application?*, *in* . 48TH PROC. COLLOQ. L. OUTER SPACE 353, 359 (2005).

nized that the intention of this provision is to determine if a State or an international intergovernmental organization shall be liable for damage caused by a launch activity. In other words, it is one of the bases to confirm the subject of international liability. Its importance is supported by suggestions of the 2007 Resolution 62/101 "Recommendations on enhancing the practice of States and international inter-governmental organizations in registering space objects."[78] ". . . The most appropriate State to register should be the State which is responsible under Article VI; in most cases, this is the State which procures the launch."[79]

That issue should be discussed from both the subjective and objective perspectives. The Chinese word "促使发射," as the translation of "procures the launching," reflects a combination of subjective and objective approaches. Black's law dictionary defines "procurement" as "the act of getting or obtaining something or of bringing something about."[80] In the author's view, the subjective element of "procures the launching" means that the responsible State shall take due care and effort to accomplish a launch. The objective element of "procures the launching" means the responsible State shall have objective connections to a launch, such as the territory or facility used for launching. But obviously these examples cannot be defined as "procures the launching," for the reason that they are separately stipulated in the provision to define a launching State.[81] This subjective and objective ele-

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[78] Recommendations on enhancing the practice of States and international intergovernmental organizations in registering space objects, G.A. Res. 62/101, U.N. GAOR, 67th Sess. U.N. Doc A/RES/62/101 (Dec. 17, 2007).

[79] COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 137.

[80] BLACK'S LAW DICTIONARY, *supra* note 34, at 1327.

[81] Article I of the Liability of Convention states:

> For the purposes of this Convention:
>
> (a) The term "damage" means loss of life, personal injury or other **impairment of health**; or loss of or damage to property of States or of persons, natural or juridical, or property of international intergovernmental organizations;
>
> (b) The term "launching" includes attempted launching;
>
> (c) The term "launching State" means:
>
> (i) A State which launches or procures the launching of a space object;
>
> (ii) A State from whose territory or facility a space object is launched;
>
> (d) The term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof.

ments approach helps to conclude the arguments about the definition of "procures the launching" as the basis of their categorization.

It can be reasonably argued that in practice it's hard to judge the intention of a State. Nonetheless, it can only be on the basis of a State's objective behavior that the intention of a State can be determined. Therefore, the objective element is more practical than the subjective element in the case of determining a State's fault liability. Some commentators' arguments are based on the objective element: the general meaning of 'procure' is 'to bring about, by *paying for a launch* or otherwise making it happen.'[82] "The essence of procurement is requesting, initiating, or at least promoting the launching of a particular space object."[83]

On the other hand, the objective element theory also has its deficiency. The question is how far should be the connection be between a launching and a State. Should it be a general connection or a genuine connection?

Taken to the extreme, it could be argued that even a small objective connection can determine that a State is a "procures the launching" State. For example, if a scientist is involved in launch research, could her or his nation of citizenship be deemed the state that "procures the launching"? An affirmative answer is inappropriate, as it imposes too many risks to a State that are beyond the reasonable range of its anticipation. Therefore, the objective element theory needs a standard to define the objective behavior of a State that can be associated with "procures the launching."

In the author's view, a genuine connection should be the pre-condition of defining "procures the launching." Here, the subjective element theory can be of some help: a genuine connection can be determined by the intention, that is, the due care and effort of a State to accomplish a launch. This is the combi-

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Liability Convention, *supra* note 3, at art. 1 (emphasis added).

[82] Karl-Heinz Böckstiegel, *The Term "Launching State" in International Space Law*, *in* 37TH PROC. COLLOQ. L. OUTER SPACE 80 (1994).

[83] Stephen E Doyle, *Legal Aspects of International Competition in Provision of Launch Services*, *in* 30TH PROC. COLLOQ. L. OUTER SPACE 203 (1987).

nation of the subjective and objective approaches that is reflected in the Chinese term, 促使发射.

The Chinese translation of the word "procure" means to promote or push something's development in order to achieve a particular purpose.[84] That is to say there are two elements to constitute a "procures a launching" State. One is that a State must display conduct related to the launching and the other is that a State must have the particular intention to accomplish the launch. Therefore, the Chinese version can be taken as a support of the theory of combination of the subjective and objective elements to define "procurement of launching."

D. A Space Object of a Launching State vs. 发射国的空间物体

The concept of a space object of launching State that is contained in Article III of Liability Convention is fundamental to defining a qualified claimant State and the liable State. It reads:

> In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.[85]

The Chinese translation of "a space object of one launching State" gives rise to different possible interpretations of the relevant "State." The Chinese term 发射国的空间物体 could be read as a State which has the ownership of the space object. It can also be taken as a registry State of the space object. Or, it could also be taken as merely a launching State or one of the launching States in case of a joint launching..

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[84] CHINESE XINHUA DICTIONARY, *available at* http://xh.5156edu.com/html5/182198.html (last visited Feb. 19, 2013).

[85] Liability Convention, *supra* note 3, at art. 1

i. One Misunderstanding Caused by the Chinese Translation: A State Which Owns the Space Object

The Chinese translation of "a space object of one launching State" is "发射国的空间物体," which seems that the "State" shall be a launching State that owns the space object. The Chinese translation of the preposition "of" is often used as a function word to indicate subordination and ownership.[86] Therefore, according to the Chinese term, the Article is read as only the owner State of a space object can be qualified to be a claimant State or a subject State of responsibility. Apparently, it should be the real intention of neither the drafters nor the translators. An owner State of a space object will always be taken as a launching State in that it procures the launching. However, in a joint launching, it is just one of the possible launching States to which the space object could be attributed, such as the launching State or the State from whose territory or facility the space object is launched. In this case, under Article III of Liability Convention, all the launching States, not only the owner State, shall be liable for the damage caused by the space object. Therefore, the misunderstanding arising from the Chinese term narrows the scope of Article III.

ii. Another Misunderstanding Caused by the Chinese Translation: A State of Registry

The phrase, "[a] space object of a launching state" as stated in the Liability Convention,[87] in Chinese could also be read as the "State of registry of a given space object." However, Article VIII of Outer Space Treaty refers to the State Party "on whose registry an object launched into outer space is carried,"[88] without giving an independent definition as to which State is precisely the State responsible for registration. There is a special

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[86] CHINESE XINHUA DICTIONARY, *available at* http://xh.5156edu.com/html3/14239.html (last visited Feb. 19, 2013).

[87] Liability Convention, *supra* note 3, at art. VII.

[88] Outer Space Treaty, *supra* note 2, at art. VIII.

definition in Article I literal c of Registration Convention,[89] which is:

> "The term 'State of registry' means a launching State on whose registry a space object is carried in accordance with article II."

According to Article II of Registration Convention, in the case of two or more launching States in respect of a space object, "they shall jointly determine which one of them shall register the object."[90] ". . . It is apparent that there shall only be one "State of registry" for any given space object."[91] However, it is not hard to draw the conclusion from Article III of the Liability Convention that not only the State of registry shall be liable for the damage caused by the space object, but the other launching States shall be jointly liable as well. Therefore, it is incorrect to describe the State in the terms of "a space object of launching State" as merely State of registry.

iii. Suggestions for Clarification

As discussed above, the "State" in the term "a space object of launching State" should not only be interpreted as "an Owner State" or "a State of registry," but also as "a launching State," which is already defined under Article I(c)(i) and (ii) of the Liability Convention as "[a] State which launches or procures the launching of a space object; [or a] State from whose territory or facility a space object is launched."

Therefore, the "State" in the term "a space object of launching State" could be merely a launching State; a State which procures the launching; or a State from whose territory or facility a space object is launched. The preposition "of" is a function word.[92] In the above term, the word "of" should be translated as its function to indicate relating to but not belonging to.[93] In

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[89] *See* COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 151.

[90] Registration Convention, *supra* note 4, at art. II, para. 2.

[91] COLOGNE COMMENTARY ON SPACE LAW, *supra* note 40, at 151.

[92] THE MERRIAM-WEBSTER DICTIONARY, *available at* http://www.merriam-webster.com/dictionary/of (last visited Feb. 19, 2013).

[93] For example, here "of" does not have the function as used in the phrase "a book of Mike's." It has the function as used in the phrase "stories of Mike."

other words, "a space object of a launching state" in article III of Liability Convention expresses the relation between the space object and all the States that should be considered as a "launching State" of this space object.

Due to the Chinese grammar, there's no appropriate translation for the term "a space object related to launching State." As far as the author is concerned, the optimal approach is to change the Chinese translation of "a space object of launching State" from "发射国的空间物体" to "空间物体," which only means "space object," i.e. to delete the translation of "launching State" and "of." And then, modify the Chinese translation of the last sentence of Article III: "the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible," to keep consistent with the logic of Article III. The modified Chinese translation[94] means "the launching State of the latter space object shall be liable to the launching State of the former space object, only if the damage is due to its fault or the fault of persons for whom it is responsible."

E. A Claimant State VS. 请求国

The scope of claimants States under Liability Convention is set up in Article VIII, which provides:

> 1. A State which suffers damage, or whose natural or juridical persons suffer damage, may present to a launching State a claim for compensation for such damage.
>
> 2. If the State of nationality has not presented a claim, another State may, in respect of damage sustained in its territory by any natural or juridical person, present a claim to a launching State.
>
> 3. If neither the State of nationality nor the State in whose territory the damage was sustained has presented a claim or notified its intention of presenting a claim, another State may, in respect of damage sustained by its permanent residents, present a claim to a launching State.

[94] The modified translation is 只有损害是因后者发射国的过失或其负责人员的过失而造成的条件下，该国才对前者的发射国负有责任".

Based on the preceding distinctions, claimant States can be divided into two types according to different victims. On one hand, in the case of damage sustained by a State, only this State *per se* can be the claimant State. On the other hand, when damage is sustained by natural or juridical persons, three types of States could be the claimant State: the national State, the territorial State, and the State of permanent residence. There is an obvious mistranslation in the Chinese version about "a State in whose territory the damage sustained." Additionally, there is confusion brought by both the Chinese grammar and this Article *per se* regarding the hierarchy of the above three types of States.

i. The Incorrect Chinese Translation in Paragraph 2 of Article VIII of Liability Convention

It is no doubt that the claimant State stipulated in paragraph 2 of Article VIII is the State as the place of the tort, i.e. "the State in whose territory the damage was sustained," as rephrased in paragraph 3. However, in the Chinese version of paragraph 2, "该自然人或法人的所在国" is translated as "[a] State, in respect of damage sustained in its territory by any natural or juridical person" means "a State as the place of natural or juridical person who suffered the damage." It is obviously a mistranslation, in that the place of the victims is not always the place of damage. For example, assume someone from State C has real property in State A and it is damaged by the space debris created by the rocket of a failed launch by State B. According to Article VIII, if State C, as the national State of the victim, has not presented a claim, then State A, as the place of damage, may present a claim on basis of its territorial jurisdiction. However, according to the Chinese version, in this case, a fourth State, State D, as a place where the victim stays, may also have the right to present a claim, even if the victim is only temporarily in State D. Undoubtedly, it does not reflect the real intention of the drafters of Article VIII.

The above Chinese translation in paragraph 2 can also be proved incorrect in light of the related Chinese translation of paragraph 3, in which "the State in whose territory the damage

was sustained" was translated to "在其境内受损的国家." This means the State that is the place of the damage. In other words, a State as place of damage, as only one of the three types of claimant States that are contained both in paragraph 2 and paragraph 3, although by different expressions. However, when read in the Chinese version, it has two totally different Chinese translations and obviously the translation in paragraph 2 is incorrect. Therefore, the translation in paragraph 2 should be taken as "在其境内受损的国家" which is consistent with the translation in paragraph 3, which means "the State in whose territory the damage was sustained."

ii. The Application Hierarchy of Different Types of Claimant States in the Chinese Version of Article VIII of Liability Convention

"Article VIII of the Liability Convention appears to establish a hierarchy among the three States which may present a claim: the national State, the territorial State, and the State of permanent residence.[95] . . . However . . . the article does not say that the State or States lower down the hierarchy may present a claim only if the State or States higher up in the hierarchy decides or decide not to present a claim."[96] In the English version, the application hierarchy of the different types of claimant States is unclear.

In contrast, the application hierarchy in Article VIII's Chinese version is much clearer. When read in its Chinese version, Article VIII has a clear hierarchy among the three types of States, i.e. the national State, the territorial State, and the State of permanent residence. According to the Chinese version, if the national State has already presented a claim, the other two may no longer do so, and if the territorial State has presented a claim, the State of permanent residence may no longer do so. As the article is worded in English at present, "there seems to be nothing to prevent even a State which is lowest in the hierarchy from presenting a claim before the States higher

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[95] *See* STUDIES IN INTERNATIONAL SPACE LAW, *supra* note 48, at 307.
[96] *Id.*

up in the hierarchy have made a decision whether or not to present a claim."[97] However, in the light of the Chinese version, a lower State only can present a claim when the State or States give up its or their right to do so. Although the literal meaning of the Chinese version is clearer than that of the English version, it is still in doubt if it was the real intention of the drafters.

In essence, the question raised in connection with Article VIII, no matter whether in the English version or the Chinese version, is the same: how to strike a balance between the interests of victims and of launching States which cause the damage? As presented above, the English version does not clearly prevent a lower hierarchy State from presenting a claim before a higher hierarchy State makes a decision. Consequently, it will be beneficial to guarantee the injury or damage of the victims being timely compensated.[98] It will improve the efficiency to settle the disputes as well. However, according to the Chinese version, the claimant States are supposed to present a claim by turns. Obviously, the launching States that causes the damage will benefit more from this than the victims.

The philosophy of the Liability Convention is victim-orientated and governments were supposed to bear the onerous liability.[99] It is the author's view that the English version of Article VIII embodies this philosophy more than the Chinese version. "It would seem that no effort should be spared by legal technicians, scholars and policy makers to propose . . . the settlement of claims and would serve the ultimate purpose of pro-

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[97] *Id.*

[98] "As to the time limitation in which claims may be presented, the Liability Convention sets it at one year from the date of occurrence of the damage or the identification of the launching State, or one year after knowledge of the occurrence and such identification. In no case can the claim be presented in more than one year following the date on which the State could reasonably be expected to have learned of the facts through the exercise of due diligence." STEPHEN GOROVE, DEVELOPMENT IN SPACE LAW 235 (Martinus Nijhoff Publishers, 1991). *See* Liability Convention, *supra* note 3, at art. X.

[99] *See* Bruce A. Hurwitz, STATE LIABILITY FOR OUTER SPACE ACTIVITIES: IN ACCORDANCE WITH THE 1972 CONVENTION ON INTERNATIONAL LIABILITY FOR DAMAGE CAUSED BY SPACE OBJECTS 57 (Martinus Nijhoff Publishers, 1992); *See also*, Stanley Mazaroff, *Exoneration from Liability for Damage Caused by Space Activities*, 54 CORNELL L. REV 95 (1968).

viding the claimant party with full legal recourse against the launching State."[100]

Therefore, the questions raised in connection with Article VIII are associated with both the grammar in the Chinese version and the ambiguity of the Article per se. Although the Chinese version is read differently than the English version, it is difficult to make precise recommendations until there is a consensus about the balance between the interests of victims and of Launching States that cause the damage.

CONCLUSION

This article addressed the comparison and analysis of some English and Chinese terms used in the United Nations space treaties. A reasonable conclusion to draw is that there are some differences between some space terms in their Chinese and English versions. Both Chinese and English are official treaty languages,[101] This article does not suggest that one is more important than the other. However, there are no official statements about the differences between the Chinese and English space terms. Therefore it is important to initiate an informed and authoritative comparison and analysis of these terms in order to provide insights into the Chinese and Western thought processes[102] as well as eliminating some obstacles at the international level between academicians and governments.

In sum, this paper analyzed five categories of confusion caused by translation issues related to space law. They are:

1. Mistranslation: for example, "该自然人或法人的所在国." This is the Chinese translation of "[a state], in respect of damage sustained in its territory by any natural or juridical person" in Article VIII of Liability Convention. The correct translation should be "在其境内受损害的国家."

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[100] GOROVE, *supra* note 98, at 238.

[101] UN at a Glance, *UN Official Languages*, http://www.un.org/en/aboutun/languages.shtml (last visited Feb. 19, 2013).

[102] For additional reading on this idea, please see, RICHARD E. NISBETT, THE GEOGRAPHY OF THOUGHT: HOW ASIANS AND WESTERNERS THINK DIFFERENTLY…AND WHY (The Free Press, 2003).

2. Improper expression and translation in Chinese official documents and Chinese versions of space treaties, for example: "共同财富" in the Chinese White Paper is the improper statement of China's position on the Outer Space Treaty. Its English translation "common wealth" is improper because it enlarges the scope of rights and obligations of the target Chinese translation. Additionally, the Chinese word "共同财产" is not appropriate as the translation of "common heritage" in Moon Agreement, in that it also enlarges the rights and obligations of "common heritage" *per se*.

3. Translation of *per se* ambiguous treaty terms. On the one hand, it is hard to reach consensus on the meaning of "international responsibility" and "international liability" in the Chinese and English versions of the treaties. This is due to the Chinese meaning in the Chinese translations and the uncertainty of the treaty terms themselves. On the other hand, some Chinese versions could provide useful perspectives for reading the space treaty term in the English version: for example, "促使发射" as the translation of "procures the launching" in Article VII of Outer Space Treaty.

4. Different legal cultural elements between international space law and Chinese domestic law, for example, the different understandings regarding the exoneration of "absolute liability" in Art II of Liability Convention.

5. Syntactic structures of the Chinese translations, for example, "发射国的空间物体," which is the translation of "a space object of launching State" in Article III of the Liability Convention.

Finally, the author hopes this paper will be a useful platform to provide insights into the differences between Chinese and English treaty terms as well as the diversity of the legal cultures in China and the West. The author further hopes that this article will assist both Chinese and Western lawyers in the on-going discussions that seek to apply the law.

Appendix

COMPARISON BETWEEN THE CHINESE AND ENGLISH TEXTS OF DIFFERENT TERMINOLOGIES

TERMS OF ART	**"Common Wealth of Mankind"**	**"Province of All Mankind"**	**"Common Heritage of Mankind"**	**"Common Heritage of Humanity (Mankind)"**
Treaty Term in English	N/A	"Province of All Mankind" (OST/MA)	"Common Heritage of Mankind" (MA)	"Common Heritage of Humanity" (UDCD); "Common Heritage of Mankind" (DPGSOF; DRRP)
Treaty Term in Chinese	N/A	全人类的事情 **(No.2)**	(全体人类的)共同财产 **(No.3)**	全人类的）共同遗产 **(No.4)**; (全人类的) 共同财富 **(No.1)**
Chinese Version in China's Space Documents	（全人类的）共同财富 **(No.1)**	N/A	N/A	N/A
English Version in China's Space Documents	"Common Wealth"	N/A	N/A	N/A
Chinese Version in Chinese law	"Common Wealth" =共同财产 No.3	N/A	N/A	N/A
Rights or Obligations Indicated in the English Version	Right of common ownership and obligation of obtaining consent of others before performing the right of disposition	Right of Exploration and Uses	Not Clear	Protection Obligations and Cultural Rights

Rights or Obligations Indicated in the Chinese Version	Obligation of protecting outer space; Right of Exploration and Use of outer space	Right of Exploration and Use of outer space	Right of common ownership and obligation of obtaining consent of others before performing the right of disposition	Protection Obligations and Cultural Rights (Obligations of Protection is a little more important than the Cultural Rights)
Proper Translation	"Common Heritage" or "Province of All Mankind"	全人类的事情 (No.2)	全人类的共同遗产 (No.4) or 全人类的共同财富 (No.1)	全人类的共同遗产 (No.4)

- **UDCD**: Universal Declaration on Cultural Diversity, Nov. 2, 2001, UNESCO Doc. 31C/RES/25, *available at* http://portal.unesco.org/en/ev.php-URL_ID=13179&URL_DO=DO_TOPIC&URL_SECTION=201.html.

- **DPGSOF**: Declaration of Principles Governing the Seabed and the Ocean Floor, and the Subsoil Thereof, beyond the Limits of National Jurisdiction, G.A. Res. 2749, U.N. GAOR Supp. (No. 28) at 24, U.N. Doc. A/8028 (1970), *reprinted in* 10 I.L.M. 220 (1971).

- **DRRP**: Declaration on Race and Racial Prejudice, U.N.E.S.C.O. Res. 3/1.1/2, Rec. of the Gen. Conf., 20th Sess. (Nov. 27, 1978), available at http://www.unrol.org/files/Declaration%20on%20Race%20and%20Racial%20Prejudice.pdf.

BOOK REVIEW

THE LEGAL STATUS OF SPACE TOURISTS IN THE FRAMEWORK OF COMMERCIAL SUBORBITAL FLIGHTS

By Michael Chatzipanagiotis
Reviewed by Diane Howard[*]

Using the perspective of the space tourist as a point of entry, Michael Chatzipanagiotis tackles the somewhat problematic realm of manned suborbital flight in his book, *The Legal Status of Space Tourists in the Framework of Commercial Suborbital Flights*, published by Carl Heymanns Verlag, Germany, in 2011 in the Schriften zum Luft- und Weltraumrecht (Studies in Air and Space Law) series.[1]

The book is primarily informative and sometimes refreshingly provocative; however, the book's first incarnation was as Chatzipanagiotis' doctoral thesis and a scholarly tone pervades its pages, making for a dry read. The material is well organized and clearly well researched. However, in several places he makes conclusory statements that either contrast with the materials to follow,[2] or lack support.[3] Either way, the end result

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[1] Michael Chatzipanagiotis, THE LEGAL STATUS OF SPACE TOURISTS IN THE FRAMEWORK OF COMMERCIAL SUBORBITAL FLIGHTS (Carl Heymanns Verlag, 2011).

[2] For instance, he states that "In the affirmative, suborbital vehicles are not space objects and space law does not apply to them", but goes on to say that, "Suborbital vehicles are space objects". *Id.* at 21 & 51. More than likely, Chatzipanagotis means to say that "in the *alternative*, suborbital . . ." but the former statement, as it stands, is misleading and could be quite confusing to either a non-legally trained reader, one who only

detracted from the positive impact that the balance of the book will make. When dealing with a topic that is so cutting-edge, so vulnerable to the vagaries of technological change and, to date, domestic legislation that is disparate, it is important for an author to proffer the rationale behind sweeping statements and to ensure consistency between introductory remarks to a chapter and the points made within it. For all of that, there are moments of brilliance contained within this book that make it a very worthwhile contribution to the *res* of scholarship pertaining to space law in general, and the growing body of works that deal with suborbital space in particular.

Chatzipanagotis outlines each of his five chapters with great detail, furthering the book's utility as a reference material for practitioners and operators in the suborbital realm. For some reason, he chose not to format his last section in the same way, instead giving it a standalone title but not referring to it as his conclusion. At first, it appeared to be an Appendix. However, it is in this last section that Chatzipanagotis brings it all home, synthesizes his many points and positions. Here, he shines the brightest.

Chapter 1 addresses the applicable regime and legal classification of space tourists. It is apparent that, of the two of these, the first presents the stickiest conundrum. Chatzipanagotis provides an excellent discussion of which regime, air or space, is most applicable to suborbital flight. His detailed description of the various approaches and theories includes enough technical information to maintain relevance. It is in this first chapter that he sets up his format of presenting *de lege lata*, then *de lege ferenda*, and, ultimately, his conclusion on the sub-topic under discussion. This format, while it chops the material up a bit, serves the greater purpose of contrast and analysis. It works.

He describes the question of applicable regime from the standpoint of both the spatial and functional theories, as is somewhat typical of the extant literature. However, technology

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read that particular section, or another person for whom English is not the native language. This is disturbing in a published work that will probably be cited.

[3] *Id.* at 157 & 167 (for his treatment of US laws limiting liability which is cursory, at best.).

has rendered these theories somewhat simplistic as vehicles now in test phase often defy easy classification. As a result, he also includes information about a recent UN COPUOS questionnaire and detailed descriptions of suborbital vehicles. Drawing upon *lex speciales* in the space treaties, Chatzipanagotis performs reasoned analysis and concludes that suborbital vehicles are space objects from the moment of their launch, which he defines as the moment the rocket engines activate, regardless of where that occurs. He states that for hybrid systems, such as Virgin Galactic's *SpaceshipTwo*, the passenger vehicle has status as a space object once it separates from the carrier aircraft.

Chatzipanagiotis allows that suborbital vehicles could fit the definitions of both an aircraft and space object during one launch event. The complications flowing from this duality form the basis for the balance of the book. Chatzipanagotis correctly, in this author's opinion, states that there are flaws with regard to the historic application of functionalism and specialist theory in attempting to resolve the air versus space regime question, and that each fails to completely address the realities of the current situation unfolding for suborbital flight. He concludes that special rules are warranted. The remaining chapters describe the legal ramifications that ensue from application of air law or of space law on a space tourist, or the spaceflight participant (SFP).

The final part of the first chapter goes on to characterize this SFP from a legal perspective. It is a comprehensive analysis. Chatzipanagotis concludes that, while not an astronaut *per se,* assistance, rescue, and salvage provisions found within the space treaties cover the SFP on a humanitarian basis.

Chapters 2, 3, 4, and 5 each describe different legal situations or recoveries as they apply to the SFP. Chapter 2 focuses on criminal law issues and security obligations. The chapter is relatively straightforward. First, he describes general concepts of international criminal jurisdiction and extradition; then he looks to air law and space law for treatment of the offending space tourist and determination of who could be held responsible for the maintenance of order when crimes are committed onboard the suborbital vehicle.

Chatzipanagotis distinguishes between Article VIII jurisdiction and control by a State over objects launched into outer space on its registry, and registration of objects as per the Registration Convention, and concludes that the Registration Convention does not apply to suborbital vehicles as it only regards space objects launched into Earth orbit or beyond.[4] Somehow, he maneuvers around this when discussing criminal jurisdiction over actions on a suborbital vehicle. He speaks of the need for a broad interpretation, allowing for jurisdiction of the State of registry, but his reasoning regarding the meaning of "jurisdiction and control" (is it technical control or legal control?) does not address the disconnect between objects launched into outer space and those which are launched into Earth orbit or beyond. It would have been better if he had, or in the alternative, that he did not attempt to so neatly present his idea as settled. In this author's view, his argument did not resolve that question. It simply supported his ultimate conclusion – that there is a need for special rules pertaining to suborbital flight. Chatzipanagotis ends by describing prevention. He makes the valid point that Annex 17 of the Chicago Convention is available as a starting point to prescribe security measures and controls, with appropriate modification.

The topics addressed in Chapter 3, Private International Law, represent some of the procedural and jurisdictional issues that arise in the posture of any claim, be it contractual or in tort. For instance, he describes forum selection clauses, *forum non conveniens,* and choice of law. It is in Chapter 4, Contractual claims, that Chatzipanagotis really addresses critical points. He dissects the air law treaties and conventions, aptly points up the contradictions between the recoveries available under the two regimes (air v. space), and extracts many provisions from the air conventions that could be applied to suborbital flight, again with modifications. It is in this fourth chapter that we find the repeated appearance of the phrase "are applicable to suborbital flights under two conditions: first, the suborbital vehicles can be considered as aircraft and second, the

[4] Convention on Registration of Objects Launched into Outer Space, art. II, *opened for signature* Jan. 14, 1975, 28 U.S.T. 695, 1023 U.N.T.S. 15.

flights are international[ ]"[5] is repeated numerous times. More than anything, the repetition brings home the point that there is a big difference in *de lege lata*, depending on how the vehicle is classed and which regime controls.

Chatzipanagotis begins Chapter 5, Extra-contractual claims, clearly distinguishing liability from responsibility. However, despite this strong start, this chapter falls short. While Chatzipanagotis exhibits substantive awareness of European law pertaining to liability of air carriers, he fails to adequately address the European proposal now before the EU which classes suborbital winged vehicles as aircraft and assigns pertinent legal matters to the air law regime. He only touches upon the subject in Chapter 5, where he discusses certification and liability for negligent certification. However, the EASA's proposal to treat suborbital vehicles in this manner has far greater impact than that revealed by Chatzipanagotis's small mention. For instance, his repeated phrase becomes reality here. Suborbital flight does fall within the existing air regime under the EASA proposal, for matters of passenger liability, not merely negligent certification.

Similarly, his handling of the US laws limiting liability is somewhat superficial. He does not really tell us much about them, or drive home their profound effect on product liability claims, which he does discuss at length. Also in Chapter 5, Chatzipanagotis makes the statement that "*[f]orce majeure* is not a ground for exoneration under the LC."[6] He does not say why. He merely gives three cites with no information to explain this broad and definitive statement. He finally gains momentum at the end of this chapter when he takes a stand regarding the US Congress' inconsistent treatment of the SFP when it comes to third-party liability. While I am not sure exactly how he arrives at the conclusion that Congress "first equated individual SFPs with companies engaged in space transportation" or where

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[5] Actually, in Chapter 3, Chatzipanagotis makes the point that the judicial jurisdictional provisions of the Warsaw system and the Montreal Convention of 1999 are applicable to suborbital vehicles that meet these same conditions (page 66) but the phrase recurs consistently in Chapter 4. Chatzipanagotis, *supra* note 1, at 66 & ch. 4.

[6] *Id.* at 139.

in the text he actually states this, he does point up the exclusion of the SFP from the indemnification scheme and discusses the sad ramifications for the SFP that could result.

The last section of the book is, in this author's view, the best one. It is not presented as a chapter, nor is it titled his "Conclusion." It is only a little into the page when it becomes clear that this section was the culmination of the preceding materials. Despite that, it is here that Chatzipanagotis synthesizes the points he makes throughout the many sub-sections of the book. Far and above the most cohesive portion of this chapter is his proposed model law and how he formats it with the sources of chosen text/law in italics immediately below the proposed Article. It is a wonderful, useful tool.

There are challenges to transforming what was, at one time, a doctoral thesis into a book suitable, or enjoyable, for an audience wider than legal academics. It can also be difficult to make subtle legal distinctions across languages. Chatzipanagotis has taken on a big subject, the question of how to legally characterize suborbital flight. True, he frames this in terms of the space tourist, but he uses the participant as a point of entry into the bigger question of how best to address the patent discrepancies in the current handling of suborbital flight in the very few jurisdictions that do. It is a task of daunting proportion. Despite the book's shortcomings, and with the caveat that some statements must be read in context and where not supported or clearly wrong, not cited, this remains an important work simply because Chatzipanagotis systematically addresses so many of the complex legal issues involved. It is a worthwhile reference tool but only when read with that *proviso*.

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