THE *GPS-GALILEO* AGREEMENT AND TREATY LAW

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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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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

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[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).