2009

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THE DUTY TO RESCUE SPACE TOURISTS AND RETURN PRIVATE SPACECRAFT

Mark J. Sundahl

I. INTRODUCTION

In late 2010, a long-awaited moment in the history of space flight will finally arrive when private space tourism companies send their first customers into space. Virgin Galactic, the space tourism company launched by Sir Richard Branson, will be the first to begin operations by flying tourists into suborbital space from Spaceport America, which is currently under construction in New Mexico. Other space tourism companies will be entering the market soon thereafter. As the prospect of a space tourism industry becomes a reality, various legal issues are taking on a new urgency. This article addresses one of the more important issues from the perspective of a space tourism company, namely, whether the duty to rescue astronauts and return spacecraft under existing space law treaties also requires states to rescue space tourists and return the spacecraft to the launching state following an accident.

Virgin Galactic's customers will not be the first space tourists. In 2001 the Russian Space Agency began to fly tourists to the International Space Station – a trip which has recently gone up in price from $20 million to $30 million – and has to date sent a total of six tourists to the space station without complica-
Now private companies are preparing to do what only governments have done before and will be doing it on a far grander scale. The number of space tourists will climb into the hundreds within the next few years and, if the business model succeeds, Virgin Galactic predicts that the number will soon reach into the thousands as daily flights leave out of Spaceport America and other facilities around the world. And Virgin Galactic is not the only name in space tourism. Excalibur Almaz, a company based on the Isle of Man, plans to put tourists into orbit in Soviet-made Almaz space capsules. The company is also preparing to use an Almaz space station as the first space hotel. Space stations that could be used as orbiting hotels are also being built by Bigelow Aerospace, which is headquartered in Las Vegas. Bigelow's Genesis space station is an inflatable orbiting platform that can house scientific, manufacturing, or leisure activities, depending on the needs of the client. Other space tourism companies are also taking shape - such as Rocketplane, which plans to launch suborbital flights out of Dubai, Xcor Aerospace, which is offering suborbital flights for a competitive price of $95,000, and Blue Origin, a highly secretive space tour-

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2 The six tourists who have visited the International Space Station are Dennis Tito, Mark Shuttleworth, Gregory Olsen, Anousheh Ansari, Charles Simonyi, and Richard Garriott. Erin Killian, Next space tourist starts training in Russia, WASH. BUS. J. (Jan. 21, 2008). The flights to the International Space Station have been booked through a private company, Space Adventures, Ltd. Id. However, the Russian Space Agency announced in January of 2009 that it would be suspending its tourism operations due to the need for an expanded Russian crew on the space station. Russia Grounds Space Tourism: International station will be too full for civilians after 2009, CHI. TRIB. 21 (Jan. 26, 2009). Space tourism could be said to have truly begun in 1990 when Toyohiro Akiyama, a Japanese journalist who spent almost eight days on the Russian space station, Mir, became the first private person to go into space. MANNED SPACE FLIGHT: LEGAL ASPECTS IN THE LIGHT OF SCIENTIFIC AND TECHNICAL DEVELOPMENTS 168 (Karl-Heinz Bückstiegel ed., 1993) (hereinafter MANNED SPACE FLIGHT). Other private individuals who have flown aboard the Space Shuttle include Senators John Glenn and Jake Garn - as well as a schoolteacher from Concord, New Hampshire, Christa McAuliffe. Tourist Class: Tito had fun, but NASA still has a point, COLUMBUS DISPATCH 6A (May 8, 2001).


4 Frank Morring, Jr., High Mileage, AVIATION WK. & SPACE TECH. 21 (May 19, 2008).

5 Id.
ism company owned by Jeff Bezos, the founder of Amazon. Another Internet mogul, PayPal-founder and high-tech visionary Elon Musk, has also positioned himself on the cutting edge of commercial space by creating a new type of rocket that can deliver payloads – and eventually people – into space in a highly efficient and cost-effective manner.

As the private space industry evolves in these new and exciting ways, it is beginning to outgrow the existing space law regime that was created at the advent of the space age – when only governments had a presence in space and the private use of space was a distant dream. Of the many legal issues that have emerged with respect to space tourism, one of the most critical issues is whether the duty to rescue astronauts and return errant spacecraft will apply to space tourism ventures. As tourism companies prepare to launch their maiden flights, their primary concern will be the safety of their customers and ability to recover their spacecraft. A steady flow of customers will be essential to the success of the tourism business model and this flow will only be possible if the public views the flights as safe. Safe operations will also reduce the risk that a space tourism company will be subjected to the crushing liability that would follow an accident. Moreover, since all of the space tourism companies plan to use reusable spacecraft to some degree, they will want to provide for the recovery of their spacecraft in the event of a flight anomaly. In addition to the issue of whether the treaties apply to tourists, clarity is also lacking with respect to other aspects of the duty to rescue – such as whether there is a duty to rescue astronauts stranded in orbit. The United Na-

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6 Jacqui Goddard, Up, Up And Ka-Ching! In a Time of Tight Budgets and Earthly Priorities, the Space Business is Getting a Rejuvenating Jolt from Entrepreneurs Who Do the Right Stuff on the Cheap, NEWSWEEK (Feb. 11, 2008).

7 In December of 2008, Musk's company, SpaceX, along with another private company, Orbital Sciences, was awarded a $3.5 billion contract by NASA to deliver cargo to the International Space Station. This contract was a watershed moment in the private space industry because NASA selected two newer companies over NASA's traditional launch service providers, Lockheed Martin and Boeing. Dana Hedgpeth, Smaller Companies Win NASA's Space Race, WASH. POST, at D1 (Dec. 24, 2008).

8 Virgin Galactic and RocketPlane will use spaceplanes that take off and land horizontally, while Excalibur Almaz will send tourists into orbit in reusable space capsules.

9 The gaps and ambiguities in the law of rescue has been traditionally viewed as a result of the hasty drafting process that produced the Agreement on the Rescue of As-
tions Committee on the Peaceful Use of Outer Space (UNCOPUOS) has been urged by member states on more than one occasion to try to resolve the flaws in this area of space law — but the issue has not yet been added to the UNCOPUOS agenda.10

This article seeks to clarify the extent to which space tourism companies can rely on states to assist with the rescue of space tourists and the return of their spacecraft in the event of an emergency. Unlike previous treatments of this subject, this article adopts an approach to treaty interpretation that rigorously adheres to the canons of interpretation set forth in the Viennese Convention on the Law of Treaties (the “Vienna Convention”). Section II of this article lays the groundwork for this analysis by describing the basic contours of the duty to rescue astronauts and return errant spacecraft under international law. Section III will then take up the fundamental questions regarding whether the duty to rescue applies to commercial ventures and whether tourists are beneficiaries of the duty to rescue. Finally, Section IV explores how the law of rescue and return should be reformed and what the best approach to reforming the law would be. Among other things, this discussion will take into account the proposals for reform set forth in the Draft for a Convention on Manned Space Flight, an illuminating (but surprisingly overlooked) document jointly drafted by Professors Böckstiegel, Gorove, and Vereshchetin some twenty years ago.

tronauts, the Return of Astronauts and the Return of Objects Launched into Space. The urgency with which the treaty was drafted was due to the importance placed by the United States and the Soviet Union on the protection of its astronauts. References to the accelerated drafting process can be found throughout the comments of the delegates to the Meeting of the General Assembly when the treaty was opened for signature. See, e.g., Provisional Verbatim Record of the Sixteen Hundred and Fortyith Plenary Meeting, U.N. GAOR, 22d Sess., at 36, 41, & 47, U.N. Doc. A/PV.1640 (Dec. 19, 1967) [hereinafter Provisional Verbatim Record]. In response to this criticism, the U.S. delegate, Mr. Goldberg, asserted that “it would be a mistake to assume that the draft had not been carefully prepared . . . [and that it] will stand the test of time.” Id. at 56.

II. AN OVERVIEW OF THE DUTY TO RESCUE AND RETURN

This section describes the scope of the duty to rescue astronauts and return errant spacecraft as the duty has evolved through the drafting of three space treaties. This analysis will show how certain weaknesses in the original expression of the duty to rescue was cured by later treaties – and how other flaws emerged in the process. As will be seen, the duty to rescue and return is broad in its conception and is motivated by a concern for human welfare. Nevertheless, certain questions of interpretation remain regarding the precise scope of the duty to rescue – such as whether the treaties require the rescue of tourists. These outstanding issues will be presented at the close of this Section and then resolved in Section III through the application of the Vienna Convention.

A. The Duty to Rescue

Ideally, space law would impose a duty to rescue whenever anyone aboard a spacecraft experiences distress, whether on the ground, in space, or on a celestial body. However, as the following description of the duty to rescue under existing space law shows, the space treaties were drafted in a manner that creates uncertainty about whether the duty to rescue under the treaties reaches this ideal.

In 1968, the first space treaty, the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty), was opened for signature.¹¹ This “Magna Carta” of space law set forth the basic principles that would guide the future use of space. Article V of the Outer Space Treaty created the foundation of the duty to rescue with broad brushstrokes that were animated by a humanitarian concern for the safety of astronauts.¹² Article V requires states to “regard astronauts as envoys of mankind” and to give astronauts “all

¹² Id. art. V.
possible assistance in the event of accident, distress, or emergency landing on the territory of another State Party or on the high seas.” The treaty also requires astronauts to provide “all possible assistance” to each other. This duty for astronauts to assist each other has the advantage of being utterly unqualified – and therefore requires such assistance under any circumstances and in any location. Unfortunately, the duty of States to rescue astronauts is not quite as comprehensive. Although Article V appears to take a comprehensive approach to the duty to rescue, there are three limitations on the duty to rescue. First, rescue is only required when “possible” – which could refer to a state’s technological or financial capability to engage in a rescue operation. Second, a careful parsing of Article V reveals a gap in the duty to rescue when astronauts have made an emergency landing, namely, that rescue is not required in the event of an emergency landing on Antarctica or on a celestial body since the duty to rescue is triggered by emergency landings only when the landing takes place “on the territory of another State Party or on the high seas.” Finally, the treaty only requires states to rescue “astronauts” – which raises the question whether states would be required to rescue non-crew members, such as passengers.

Just one year after the Outer Space Treaty was opened for signature, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Space (Rescue Agreement) was concluded in order to elaborate upon the duty to rescue and return that had been established in Article V of the Outer Space Treaty. The Rescue Agreement

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14 Id.

15 Outer Space Treaty, supra note 11, at art. V. On the other hand, rescue of astronauts stranded in space would be covered under the language of Article V. See, e.g., R. Cargill Hall, Rescue and Return of Astronauts on Earth and in Outer Space, 63 AM. J. INT’L L. 197, 205 (1969).

addresses the rescue of spacecraft personnel in two provisions. Article 2 addresses "unintended landings" of spacecraft personnel in a state's territory and requires that the state "immediately take all possible steps to rescue them." Article 3 complements Article 2 by addressing accidents that occur outside of any state's jurisdiction and provides that if a state discovers that "the personnel of a spacecraft have alighted on the high seas or in any other place not under the jurisdiction of any State, those Contracting Parties which are in a position to do so shall, if necessary, extend assistance in search and rescue operations." These two provisions, working together, would appear to provide for rescue wherever a spacecraft experiences distress. The gap in Article V of the Outer Space Treaty that excludes crash landings on Antarctica or a celestial body is corrected by the Rescue Agreement since rescue is required under Article 3 if a spacecraft alights "any other place not under the jurisdiction of any State" (which would include parts of Antarctica as well as a celestial body). However, despite the fact that the Rescue Agreement fills a gap in the Outer Space Treaty, it opens a new gap at the same time by using the word "alighted" in Article 3. The effect of this word is to make the duty to rescue contingent on the landing of the spacecraft – which, as a result, appears to rule out any duty to rescue personnel stranded in orbit or in deep space. Finally, Article 4 of the Rescue Agreement requires states to "safely and promptly" re-

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17 Id. at art. 2.
18 Id. at art. 3.
19 Id. See also CARL Q. CHRISTOL, THE MODERN INTERNATIONAL LAW OF OUTER SPACE 171-72 (1982) (explaining that a U.S. delegate to the Rescue Agreement negotiations understood "any other place not under the jurisdiction of any State" to include the moon and celestial bodies.). Regarding jurisdictional claims over Antarctica see Joseph J. Ward, Black Gold in a White Wilderness—Antarctic Oil: The Past, Present, and Potential of a Region in Need of Sovereign Environmental Stewardship, 13 J. LAND USE & ENVTL. L. 363, 367 (1998) (explaining that fifteen percent of Antarctica is not claimed by any country).
20 CHRISTOL, supra note 19, at 171-72; see also Paul G. Dembling & Daniel M. Arons, The Treaty on Rescue and Return of Astronauts and Space Objects, 9 WM. & MARY L. REV. 630, 649 (1968). This unfortunate gap in the Rescue Agreement created by the use of the word "alighted" could not have been intended, as is indicated by the comment of the French delegate, Mr. Berard, that the Rescue Agreement "applies to research and rescue undertaken not only on the earth and in its environment, but also in outer space and on celestial bodies." Provisional Verbatim Record, supra note 9, at 41.
turn the rescued personnel to representatives of the launching authority following a successful rescue operation.\footnote{21} The duty to rescue was next addressed in the 1979 Agreement Governing the Activities of States on the Moon and Other Celestial Bodies (Moon Agreement).\footnote{22} The approach to the duty to rescue taken in the Moon Agreement was the most comprehensive of all the space treaties. First, the treaty requires states to take “all practicable measures to safeguard the life and health of persons on the moon.”\footnote{23} There are no gaps in this language. All people, whether crewmembers, scientists, or tourists, must be safeguarded. Second, the Moon Agreement requires states to “offer shelter in their stations, installations, vehicles and other facilities to persons in distress on the moon” as well as allowing states to use the facilities of other States in the event of an emergency.\footnote{24} Finally, the Moon Agreement extends the duties owed to “astronauts” and “personnel” under the Outer Space Treaty and Rescue Agreement to all people on the Moon.\footnote{25}

Despite the admirable breadth of the rescue provisions in the Moon Agreement, the value of the treaty is compromised in two ways. First, it is restricted to the Moon and therefore is not applicable to the early stages of private spaceflight, which will be suborbital and orbital for the near term. Second – and more importantly – the Moon Agreement has been ratified by only thirteen states (compared to the Outer Space Treaty and the Rescue Agreement which have been ratified by ninety-eight states and ninety states, respectively), which renders it the least successful of the space treaties.\footnote{26}

As indicated above, the question of whether the duty to rescue applies to space tourists hinges on whether tourists qualify as “astronauts” or “personnel” of a spacecraft under the treaties.

\begin{footnotes}
\footnote{21} Rescue Agreement, supra note 16, at art. 4.
\footnote{22} Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, Dec. 5, 1979, 1363 U.N.T.S. 3 [hereinafter Moon Agreement].
\footnote{23} Id. at art. 10(1).
\footnote{24} Id. at arts. 10(1) & 10(2).
\footnote{25} Id. at art. 13(2).
\end{footnotes}
Moreover, a preliminary question that is of equal importance to the application of the treaties to tourists is whether the duty to rescue extends to participants (whether crewmembers or passengers) of commercial spaceflights — or is instead strictly limited to state-sponsored missions. These issues will be analyzed further in Section III below after the duty to return errant spacecraft has been described.

B. The Duty to Return Errant Spacecraft

If a private spacecraft veers off course and lands in foreign territory, the owner of the spacecraft will want to be able to retrieve the spacecraft for reasons other than rescuing the passengers and crew. The risk of losing a spacecraft could be devastating to a space tourism company for two reasons. First, the cost of constructing a new vehicle may be prohibitive and, provided that the downed spacecraft is still functional or repairable, the cost of replacement could be avoided. Second, any proprietary technology that falls into the hands of an unfriendly government could result in the theft of the technology — which might eventually be shared with a company's competitors. For both of these reasons, a company will want to quickly recover its errant spacecraft. However, a foreign government that has possession of the spacecraft may not want to part with it. For example, the foreign government may want to impound the spacecraft on the grounds that it violated the country's aircraft regulations. A foreign government may also have more nefarious reasons for refusing to return a high-tech spacecraft since an unintended landing may provide a rare opportunity for certain countries to gain access to exotic technology through reverse engineering. The space treaties provide for a duty to return spacecraft to the launching state in order to prevent such misappropriation of technology. It would provide great comfort to private space companies if they were assured that the benefits of this aspect of space law extended to their vehicles as well as to government spacecraft.

27 Although insurance could potentially cover the cost of replacing a spacecraft, it is not clear whether such insurance will be available or affordable.
As is true for the duty to rescue, the duty to return space assets is contained in the Outer Space Treaty, the Rescue Agreement, and the Moon Agreement. Beginning with the Outer Space Treaty, Article VIII provides that "objects or component parts found beyond the limits of the State Party to the [Outer Space] Treaty on whose registry they are carried shall be returned to that State Party." This provision is broadly drafted to require the return of space objects regardless of whether the errant objects are found on Earth, on the high seas, in space, or on a celestial body. Article 5 of the Rescue Agreement elaborates upon and expands this duty in several ways. First, Article 5 has a notification requirement which requires a state "which receives information or discovers that a space object or its component parts has returned to Earth in territory under its jurisdiction or on the high seas or in any other place not under the jurisdiction of any State" to notify the launching state and the Secretary-General of the United Nations. Unlike the other provisions regarding the return of spacecraft, this notification language is drafted narrowly to require notification only when the space object has "returned to Earth," thus apparently releasing states from any duty to notify the launching authority if information is received, for example, that a spacecraft has gone adrift in space or has crashed on the Moon. Second, Article 5 requires a state on whose territory a spacecraft lands to "take such steps as it finds practicable to recover the object" upon the request of the launching state. Third, if a State finds a space object or its component parts outside of the territory of

28 Outer Space Treaty, supra note 11, at art. VIII.
29 Article 5(1) of the Rescue Agreement reads thus:

Each Contracting Party which receives information or discovers that a space object or its component parts has returned to Earth in territory under its jurisdiction or on the high seas or in any other place not under the jurisdiction of any State, shall notify the launching authority and the Secretary-General of the United Nations.

Rescue Agreement, supra note 16, at art. 5(1). Although there is a notification requirement in Outer Space Treaty, it only requires states to inform other states of "any phenomenon . . . which could constitute a danger to the life or health of astronauts." Outer Space Treaty, supra note 11, at art. V. It is debatable whether this provision requires notification upon the discovery of a crash landing.

30 Rescue Agreement, supra note 16, at art. 5(2).
the launching authority, the state must return the object upon the request of the launching authority.\textsuperscript{31} Fourth, Article 5 includes a provision allowing a state to do what is necessary to eliminate any possible danger that might result from a hazardous space object that is found in its territory.\textsuperscript{32} Finally, Article 5 places the cost of recovery and return upon the launching authority – a clear distinction from the duty to rescue which does not require reimbursement of expenses incurred by the rescuer.\textsuperscript{33}

Article 12(2) of the Moon Agreement simply incorporates Article 5 of the Rescue Agreement by reference and extends it expressly to assets located on the Moon:\textsuperscript{34}

Vehicles, installations and equipment or their component parts found in places other than their intended location shall be dealt with in accordance with article 5 of the [Rescue Agreement].

The practical effect of this provision is small. First, the failure to achieve broad ratification means that few countries are bound by the Moon Agreement. Second, the duty to return space objects under the Moon Agreement does not expand upon the duties imposed by the Outer Space Treaty and the Rescue Agreement – which, as argued above, already applied to lunar activities. The Moon Agreement also requires a State to notify the launching State upon learning of an unintended landing on the Moon.\textsuperscript{35}

The application of the duty to return errant spacecraft to private tourism ventures presents fewer problems than are found in the application of the duty to rescue. Namely, there is no controversy regarding the meaning of “astronaut” or “personnel” since the duty to return spacecraft is triggered by the crash of a spacecraft – regardless of who is on board. However, one important question remains regarding the scope of the duty

\textsuperscript{31} Id. at art. 5(3).
\textsuperscript{32} Id. at art. 5(4).
\textsuperscript{33} Id. at art. 5(5).
\textsuperscript{34} Moon Agreement, supra note 22, at art. 12(2).
\textsuperscript{35} Id. at art. 13.
to return, namely, whether the duty applies to private commercial spacecraft. This issue is explored in the following section.

III. DOES THE DUTY TO RESCUE AND RETURN APPLY TO SPACE TOURISM?

As shown above, two interpretational issues cloud the question whether the duty to rescue and return applies to tourists. The first issue is whether the duty applies when the spacecraft in distress is a private commercial vehicle. The second issue is whether tourists would be deemed to be "astronauts" or "personnel" under the treaties — and would therefore be able to rely on the assistance of state governments in the event of an accident. These issues will be examined in this Section in accordance with the interpretational canons of the Vienna Convention which, as seen below, ultimately results in a broad interpretation of the duty to rescue and return that encompasses the rescue of space tourists.

A. The Vienna Convention

The Vienna Convention sets forth the rules that govern the creation, operation, and interpretation of treaties. The rules regarding interpretation, contained in Articles 31 through 33 of the convention, provide a systematic process for determining the meaning of treaty provisions.\(^{36}\) This systematic approach to interpretation will guide the following analysis of the duty to rescue and return in order to arrive at an interpretation that is supported by the authority of the Vienna Convention. Article 30 of the Vienna Convention, which provides rules that are designed to help resolve inconsistencies between treaties, will also be helpful in the following analysis where it is necessary to resolve certain discrepancies between the Outer Space Treaty and the Rescue Agreement.\(^{37}\)

The primary rule of treaty interpretation under the Vienna Convention is to give the terms of a treaty their "ordinary mean-

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37 Id. at art. 30.
ing in their context and in the light of [the treaty's] object and purpose." This "ordinary meaning" should be the meaning that was attributed to a term at the time of the treaty's signing. As indicated in the Vienna Convention, a term should not be interpreted in isolation, but should always be viewed in its greater "context" as well as its "object and purpose." The "context" of a term consists of the text and preamble of the treaty - and must be distinguished from the circumstances of the treaty's conclusion (which are only taken into account for the limited purposes described below). Similarly, a treaty's "object and purpose" are to be determined only from the text of the treaty and not from external sources of information. As reflected in these rules, the Vienna Convention takes a text-centered approach to interpreting treaties that generally requires strict adherence to the text. That being said, the Vienna Convention also requires that any subsequent state practice that sheds light on the proper application of the treaty be taken into account when determining the ordinary meaning of a term.

In the event that the ordinary meaning of a term is ambiguous (or needs to be confirmed) "supplementary means of interpretation" may be applied to provide clarification. These supplementary considerations include the travaux préparatoires of the treaty as well as the circumstances of the treaty's conclusion. Recourse to these supplementary considerations is also permitted when the ordinary meaning of a term results in a meaning that is "manifestly absurd or unreasonable."

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38 Id. at art. 31(1).
40 Vienna Convention, supra note 36, at art. 31(2). See also International Law Commission, Draft Articles on the Law of Treaties with Commentaries 221 (1966); RICHARD K. GARDINER, TREATY INTERPRETATION 178-89, 343-45 (2008).
41 GARDINER, supra note 40, at 192.
43 Vienna Convention, supra note 36, at art. 31(3).
44 Id. at art. 32.
45 Id.
46 Id.
When determining the meaning of a treaty, the International Court of Justice (ICJ) can also turn to the official translations of the treaty to see whether the terms used in a translation can assist in clarifying the meaning of a term. Specifically, Article 33(4) of the Vienna Convention states that "when a comparison of the authentic texts discloses a difference of meaning . . . , the meaning which best reconciles the texts, having regard to the object and purpose of the treaty, shall be adopted." 47

The Vienna Convention rules governing the reconciliation of dissonant treaties also provide helpful guidance in the interpretation of the duty to rescue and return – given the fact that the duty to rescue and return is addressed in multiple treaties that are, in certain respects, inconsistent. Under Article 30, a conflict between two treaties should be resolved by the lex posteriori rule which gives precedence to the provisions of the most recent treaty – unless the later treaty specifies that it is subject to the earlier treaty. 48

Although Article 4 of the Vienna Convention states that the convention only applies to treaties concluded after it enters into force, this does not mean that the rules of interpretation contained in the Vienna Convention should not be applied to the Outer Space Treaty and the Rescue Agreement. 49 The interpretational rules of the Vienna Convention were not drawn from thin air, but are instead a codification of customary practice and are binding as an expression of customary international law. 50 In fact, the ICJ has accepted the Vienna Convention rules as applicable to the interpretation of all treaties, including those that were entered into prior to the conclusion of the Vienna Convention. 51 In light of this, any proposed interpretation of the duty to rescue and return under the space treaties must be carried out in accordance with the Vienna Convention rules. These

47 Id. at art. 33(4).
48 Id. at art. 30(2) & (3).
49 Id. at art. 4.
50 GARDINER, supra note 40, at 14-16, 69. See also Legal Consequences of the Construction of a Wall in the Occupied Palestinian Territory (Advisory Opinion) [2004] ICJ Reports 38, para 94 (stating that Article 31 of the Vienna Convention expresses the customary international law regarding treaty interpretation).
51 GARDINER, supra note 40, at 14.
rules are put to work in the following sections to resolve the interpretational problems that are relevant to whether the duty to rescue and return applies to space tourists.

B. The Relationship between the Outer Space Treaty and the Rescue Agreement

Before we address the question of whether the duty to rescue and return requires the rescue of space tourists and private spacecraft, the relationship between the Outer Space Treaty and the Rescue Agreement must be clarified. Under the *lex posteriori* rule in Article 30 of the Vienna Convention, the Outer Space treaty applies "only to the extent that its provisions are compatible" with the Rescue Agreement. That the Rescue Agreement was intended to supersede the Outer Space Agreement with respect to the duty to rescue and return is clear. The Rescue Agreement elaborates upon, adds to, and, at times, changes the rules regarding rescue and return set forth in Article V of the Outer Space Treaty. There is no doubt that these changes were intended to supersede the earlier rules, since the drafters would not bother creating a treaty that had no effect. Although the preamble takes note of the Outer Space Treaty and of the Rescue Agreement says that the purpose of the treaty is "to develop and give further concrete expression" to the duty to rescue and return contained in the Outer Space Treaty," this does not rise to the level of explicitly subjecting the Rescue Agreement to the Outer Space Treaty. Therefore, under the operation of the *lex posteriori* rule, the Rescue Agreement must trump the Outer Space Treaty where the terms are inconsistent.\(^{52}\)

This application of the *lex posteriori* rule gives precedence to the Rescue Treaty with respect to multiple issues that are addressed differently in the Outer Space Treaty. For example, the broader geographic coverage of the duty under the Rescue Agreement supersedes the coverage in the Outer Space Treaty – which left a gap with respect to landings on celestial bodies and Antarctica. Also, the Rescue Agreement's requirement to return

\(^{52}\) Rescue Agreement, *supra* note 16, fourth recital.
space objects to the “launching authority” replaces the Outer Space Treaty’s rule of returning the assets to the state of registry. However, the changes that are of greatest importance to the question of whether the duty to rescue and return applies to space tourism are (1) the use of the term “personnel” in the Rescue Agreement instead of “astronaut” and (2) the omission from the Rescue Agreement of the phrase “envoys of mankind.” As explained in greater detail below, the use of the term “astronaut” and the phrase “envoys of mankind” could support a narrower reading of the duty to rescue – one which would likely exclude space tourists and commercial flights. The omission of this language from the Rescue Agreement changes the substance of the law by broadening the scope of the duty to rescue so that it applies to tourists and commercial flights – and this broader scope supersedes the narrower rule of the Outer Space Treaty under the *lex posteriori* rule.

C. Does the Duty to Rescue and Return Apply to Commercial Ventures?

The preliminary question of whether the duty to rescue and return applies to commercial ventures must be resolved before we turn to the more specific issue of whether tourists can be beneficiaries of the duty to rescue.

When interpreting a treaty under the Vienna Convention, the starting point is always the plain language and ordinary meaning of the text. In light of this, the question of whether the duty to rescue and return applies to commercial ventures would appear to require an affirmative answer since nothing in the text of either the Outer Space Treaty or the Rescue Agreement explicitly excludes commercial venture or limits the scope of the duties to government-sponsored missions. However, in the interest of being thorough, attention should be paid to certain key terms that have a bearing on the scope of the duty to rescue and return to see whether their meaning might operate to restrict the scope of the treaty to government activity. These key terms are “astronaut” and “space vehicle” (in the Outer Space Treaty) and “personnel,” “space object,” and “spacecraft” (in the Rescue Agreement). None of the terms in the Rescue
Agreement exclude commercial enterprises in their ordinary meaning – in fact, “personnel” is typically used in a commercial context (e.g., cruise ship personnel) as well as in government contexts. This lack of any distinction between private and public spaceflight in the plain language of the Rescue Agreement supports a broad interpretation which would require states to rescue non-governmental personnel and return private spacecraft.

The analysis of the Outer Space Treaty may point at a different result because, as discussed in greater detail below, one could argue that the ordinary meaning of “astronaut” at the time of the signing of the Outer Space Treaty would have been understood to include only the members of the crew on government-sponsored missions. However, as is also explained below, the application of the *lex posteriori* rule results in the Rescue Agreement superseding Article V of the Outer Space Treaty – which deprives the term “astronaut” of any operative force in the context of rescue and return.

An analysis of state practice under Article 31 of the Vienna Convention also supports extending the application of the Rescue Agreement to commercial spacecraft. Although no state has yet been required to fulfill its duty to rescue astronauts, the record is a little richer with respect to the return of space objects. There have been seven instances of space objects being found on Earth resulting in the notification of the Secretary-General and the return of the assets to the launching authority.53 Five of these episodes involve the discovery of government assets – but two involve the discovery of private spacecraft. Specifically, the governments of Argentina and South Africa, in 2000 and 2004, respectively, notified the Secretary-General of the discovery and planned return to the United States of space objects that had been found in their respective territories.54 In both cases, the governments had determined prior to giving notification that the space objects were parts of Delta II launch vehicles which –

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although they delivered government payloads – were owned by a private company, namely, the Boeing Company. Thus, we have some evidence of States extending the duty to return to privately-owned commercial vehicles. And if States feel compelled under the law to fulfill the duty to return private vehicles, there is no reason why the other duties imposed by the treaty, including the duty to rescue, should be viewed any differently.

On the other side of the argument is an oft-cited comment made by the French delegate at the presentation of the Rescue Agreement to the General Assembly. In his comment, the delegate clearly announces that the duties of the Rescue Agreement were not intended to apply to commercial ventures. The relevant part of the comment is reproduced here:

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Before concluding, I should like to emphasize that the text of the convention, as the French Government understands it, applies in full only to flights that are experimental and scientific in nature. The rights of the signatory States must be fully reserved for the time when such flights may become utilitarian or commercial in character, at which time it will doubtless be necessary to negotiate a new convention.

Although this comment would seem to carry great weight due to the fact that it specifically addresses the issue at hand, it cannot be allowed to control the meaning of the treaty. First of all, it is only the opinion of one State that is expressed and there were likely to have been other views. But more importantly, this instance of travaux préparatoires does not enter the analysis according to the rules of the Vienna Convention. Under Article 32 of the Vienna Convention, recourse to the travaux préparatoires is only allowed for the purpose of confirming – not challenging – the ordinary meaning of the treaty language (unless the language is deemed ambiguous or absurd, which is not the case here since the treaty language clearly encompasses both government and commercial operations). Although disregarding the comment of the French delegate may seem imprudent to some, the Vienna Convention rules were written to give primacy

55 Provisional Verbatim Record, supra note 9, at 42.
to the written word for the purpose of limiting recourse to the easily manipulated morass of *travaux préparatoires*.

In addition to the foregoing arguments under the Vienna Convention, the extension of the duty to rescue and return to commercial ventures is also reasonable because it would be consistent with the approach of other duties under the space treaties. For example, Article VI of the Outer Space Treaty extends the application of the treaty to private space operations by requiring that States supervise the space activity of non-governmental entities and bear responsibility for any failure of non-governmental entities to comply with the treaty. It is also generally accepted that a launching state must register under the Convention on Registration of Objects Launched into Outer Space. Similarly, a State is liable for any damage caused by space objects launched from its territory (or whose launch the state procures) under the Convention on International Liability for Damage Caused by Space Objects – whether such objects are owned by the government or a private entity.

Finally, an overwhelming majority of commentators agree with extending the benefits of not only the duty to rescue and return, but of the entire body of space law, to commercial participants. Although the views of commentators do not enter

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56 Outer Space Treaty, supra note 11, at art. VI.
57 Convention on Registration of Objects Launched into Outer Space, art. 1, Jan. 14, 1975, 1023 U.N.T.S. 15; see also Practice of States and International Organizations in Registering Space Objects: Replies from Member States, U.N. Document A/AC.105/C.2/L.250/Add.1 p. 3 (reporting that France "registers national satellites, whether they belong to government organizations or private companies.").
into interpretational analysis under the Vienna Convention, such opinions can themselves have the force of law under Article 38 of the Statute of the International Court of Justice.  

D. Are Space Tourists Beneficiaries of the Duty to Rescue?

Even if the duty to rescue extends to commercial spaceflight, the question still remains whether the law only requires states to rescue crew members, or private passengers as well. As discussed above, the Moon Agreement requires that states take actions to safeguard the lives of “all persons on the moon.” The phrase “all persons” is sufficiently generic to embrace government astronauts, scientists, tourists, and any other people on the Moon. However, the Outer Space Treaty and the Rescue Agreement use narrower terms when they require the rescue of “astronauts” and “personnel,” respectively. Whether these terms can be interpreted as including space tourists is an open question – but the Vienna Convention proves to be helpful in arriving at a broad interpretation of the duty, i.e., one that allows tourists to benefit from the rescue duty.

The Outer Space Treaty’s use of the term “astronaut” has been understood by some commentators to limit the duty to rescue to (1) the pilot and crew or (2) the pilot, crew, and any professional performing a service on board. Under either approach, private passengers would be excluded. However, it is debatable whether “astronaut” carries such a limited meaning when analyzed under the Vienna Convention. According to

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61 See, e.g., Dembling & Arons, supra note 20, at 642.


63 For commentators who support a broad reading of “astronaut” to include everyone on board a spacecraft, see, e.g., Bin Cheng, “Space Objects”, “Astronauts” and Related Expressions, in PROCEEDINGS OF THE THIRTY-FOURTH COLLOQUIUM ON THE LAW OF
the 1972 *Oxford English Dictionary*, the meaning of "astronaut" is "one who travels in space, i.e. beyond the earth's atmosphere" or "a student or devotee of spaceflight." Putting "students and devotees of astronautics" aside, this dictionary definition is virtually identical to the definition of "astronaut" set forth in the 1965 edition of the *Dictionary of Technical Terms for Aerospace*, which includes in the definition of "astronaut" (1) those who engage in space flight and (2) those who train for spaceflight. There is nothing in the first definition that would exclude private passengers (nor in the second definition since, at least under the law of the United States, tourists will undergo training for their flight). Because there is no ambiguity regarding the inclusion of passengers in either definition (since neither definition exclude passengers), supplementary means of interpretation can only be applied to confirm the inclusion of passengers - but not challenge it.

On the other hand, an argument could be made that the ordinary meaning of "astronaut" at the time of the signing of the Outer Space Treaty would have included only the crewmembers and technicians on government-mounted missions. After all, the drafters of the Outer Space Treaty were creating the treaty at a time when only governments had the ability to put objects into space and private space use was an impossibility. This

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44 *Astronaut, A SUPPLEMENT TO THE OXFORD ENGLISH DICTIONARY* (1972). See also, WEBSTER'S THIRD NEW INTERNATIONAL DICTIONARY (1967) (defining "astronaut" as "a traveler in interplanetary space").

45 Kamenetskaya, supra note 62, 177 (citing DICTIONARY OF TECHNICAL TERMS FOR AEROSPACE USE 16 (1965)).

46 Human Space Flight Requirements for Crew and Flight Participation, 71 Fed. Reg. 75616, 75626 (Dec. 15, 2006) (to be codified at 14 C.F.R. §460.51) (requiring an operator to train each space flight participant before flight on how to respond to emergency situations, such as fire and loss of cabin pressure).

47 In a recent article, Professor Stephan Hobe explains that the term "astronaut" differs from "personnel" in that "astronaut' has a more explorative or scientific meaning, [while] personnel has a more functional meaning." Stephan Hobe, *Legal Aspects of Space Tourism*, 86 NEB. L. REV. 439, 455 (2007). Professor Hobe thus recognizes that "astronaut" may have held a specialized meaning that would have excluded passengers. *Id.*
would coincide with the current internal regulations of the United States Air Force which grant an astronaut rating only to Air Force officers (and not private parties) who perform duties fifty miles or more above the Earth's surface.68 Confirmation of this interpretation is also found in the Russian translation of the Outer Space Agreement, which uses the word “cosmonaut” rather than “astronaut.” As explained above, Article 33(4) of the Vienna Convention permits recourse to translated versions of a treaty to assist in interpretation. According to the 1970 edition of Kosmonavtika: Malenkaya entsiklopediya a “cosmonaut” is a person who is a pilot or crew member of a space vehicle who is specially trained in a medical, biological, scientific or technical field, and, therefore, the term “cosmonaut” would not include private passengers.69

Proponents of a narrow interpretation of “astronaut” also point to the use of the phrase “envoys of mankind” in reference to astronauts in the Outer Space Treaty.70 It can be argued that this phrase serves as relevant context that should be taken into account when determining the “ordinary meaning” of astronaut. However, the significance of the phrase “envoys of mankind” is questionable.71 Historically, envoys are representatives of government and, therefore, it is not surprising that commentators find in the word an indication that “astronaut” should be defined as participants in a government operation. However, no

69 Kamenetskaya, supra note 62, at 177 (citing Kosmonavtika: Malenkaya entsiklopediya 239 (1970)). Under the authority of an interim measure, the Federal Aviation Administration has awarded “Commercial Astronaut Wings” the two commercial pilots who piloted SpaceShipOne to victory in the X-Prize competition, Mike Melvill and Brian Binnie. See Commercial Space Data – Active Licenses, Federal Aviation Administration Website, at http://www.faa.gov/about/office_org/headquarters_offices/ast/launch_data/current_licenses. However, it is not clear that such astronaut wings will be awarded to mere passengers on future commercial tourist flights.
71 Cheng, supra note 63, at 25 (asserting that the phrase “envoys of mankind” is “no more than a figure of speech without any legal significance.”); see also V.S. Vereshchetin, Legal Status of International Space Crews, in PROCEEDINGS OF THE TWENTY-FIRST COLLOQUIUM ON THE LAW OF OUTER SPACE 164 (1979).
State has the authority to appoint an “envoy of mankind.” This concept is supranational and therefore any person, whether a government agent or private person, has equal claim to the title “envoy of mankind.” The insignificance of the phrase is also indicated by its omission from the Rescue Agreement. From this perspective, the phrase fails to impose any limitation on the meaning of astronaut and therefore opens the door to a broader definition that includes anyone on board a spacecraft, including passengers.

Although the foregoing debate is an interesting one, the issue regarding the meaning of astronaut is a moot point because, as discussed above, the Rescue Agreement supersedes the Outer Space Treaty with respect to the duty to rescue under the lex posteriori rule. The Rescue Agreement employs the phrase “personnel of a spacecraft” to describe the beneficiaries of the duty to rescue rather than “astronaut” — and this inconsistency is resolved in favor of the later treaty. As a result, space tourism companies only need to concern themselves with the question of whether “personnel” includes their passengers.

With respect to the meaning of “personnel,” we begin the analysis once again with its ordinary meaning. According to the 1968 edition of Webster’s New World Dictionary, “personnel” means “persons employed in any work, enterprise, service, etc.” On a positive note, this definition is broad in the sense in that it carries no connotation of government activity (as “astronaut” is more likely to carry), thus allowing for the duty to rescue to extend to personnel of commercial flights. However, the phrase “personnel of a spacecraft” is narrow in the sense that it would only cover the pilot, crew, and other service providers on board, while private passengers (who provide no service on board) would be excluded from the ordinary meaning of the term. There are a number of commentators who would like to define “personnel” broadly so that it would include space tour-

72 Personnel, WEBSTER’S NEW WORLD DICTIONARY (1968).
73 Both Stephen Gorove and Bin Cheng reluctantly agree that “personnel” would exclude passengers, although Prof. Cheng makes a point of noting that the drafters of the Rescue Agreement did not intend this result. Gorove, supra note 62, at 93; Cheng, supra note 63, at 165.
ists – but the challenge is achieving a broad definition in a manner that complies with the customary law of treaty interpretation as codified in the Vienna Convention.\textsuperscript{74} The remainder of this section explores potential methods for expanding the scope of “personnel” beyond its dictionary definition.

The simplest solution would be to find support for the contention that the ordinary meaning of personnel at the time of drafting was in fact sufficiently broad so as to include private passengers on a spaceplane. The unforgivingly narrow dictionary definition of the term would make this argument difficult. However, in making this argument one could point to the use of the term “personnel” in Article VIII of the Outer Space Treaty, which is reproduced here.\textsuperscript{75}

\begin{quote}
A State Party to the Treaty on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object, and over any personnel thereof, while in outer space or on a celestial body.
\end{quote}

Scholars have not hesitated to interpret “personnel” in this context broadly to include any and all people on board a spacecraft – which was certainly the intention of the drafters.\textsuperscript{76} And if “personnel” was used to refer to all persons in the Outer Space Treaty, it could be argued that this was an ordinary meaning of


\textsuperscript{75} \textit{Outer Space Treaty, supra} note 11, at art. VIII.

\textsuperscript{76} \textit{MANNED SPACE FLIGHT, supra} note 2, at 194; \textit{see also} Hobe, \textit{supra} note 67, at 455.
the term that should also be adopted when interpreting the Rescue Agreement.\textsuperscript{77}

Another approach to seeking a broad definition of “personnel” is to take into account the humanitarian purpose of the Rescue Agreement when interpreting the term as is required under Article 31 of the Vienna Convention. That the main principle and purpose behind the Rescue Agreement was the humanitarian desire to protect the life of those aboard a spacecraft is reflected in the treaty’s fourth recital which states that the treaty was “prompted by sentiments of humanity."\textsuperscript{78} However, the use of the object and purpose of a treaty for interpretational purposes has its limits. Although the object and purpose can be used to help the ICJ select among competing “ordinary meanings” of a term, the object and purpose cannot be used to overrule the accepted meaning of a term and, in effect, allow for the creation of a definition that has no basis in the term itself. Since the dictionary definition of “personnel” refers to a service provider, it is not possible to ignore this and simply create a new definition of “personnel” that would embrace private passengers on the basis of the humanitarian nature of the treaty.

Another way of achieving a broad reading of “personnel” would be to interpret the term in light of travaux préparatoires that would support an expansive definition. Such travaux exists in the form of the following comment by the Italian delegation, which had followed the lead of the United States by employing the term “personnel” in their proposed text of the Rescue Agreement:\textsuperscript{79}

[The text proposed by Italy] refers to personnel (or crew) and not specifically to astronauts, since everyone on board has a right to assistance for humanitarian reasons.”

This comment that “everyone on board” has a right to rescue indicates that the drafters understood the term broadly in a way

\textsuperscript{77} Gardiner, supra note 40, at 283 (explaining that the use of the same term in another treaty is relevant to determining the ordinary meaning of the term in the first treaty).

\textsuperscript{78} Rescue Agreement, supra note 16, at recitals.

\textsuperscript{79} Proposals, amendments and other documents relating to assistance to and return of astronauts and space vehicles, U.N. Doc. A/AC.105/37 Annex I at 10.
that should even include private passengers. However, under Article 31 of the Vienna Convention, *travaux préparatoires* can only be used to assist in interpretation when ambiguity exists in the text, i.e., when a term is not "clear." This prevents the use of *travaux* in this case, since there is no ambiguity in the term "personnel." The term is commonly understood to refer only to service providers and never to passengers, guests or the like. Therefore, we must seek another course to a broad interpretation of the term.

Another argument in support of a broad interpretation of "personnel" might be made under Article 33(4) of the Vienna Convention if it can be shown that the translation of "personnel" in the Spanish, French, or Chinese versions of the treaty referred to all persons on board a spacecraft. The Rescue Agreement supports this approach in Article 10 which states that the texts of the treaty in various languages are equally authentic and carry the same weight. In pursuit of this line of argument, the translations of the word "personnel" in the French, Spanish, Russian, and Chinese versions of the Rescue Agreement have been analyzed in order to see whether the words used in these versions of the treaty might expand the scope of the duty to rescue to include passengers. However, the results of this analysis are not helpful since all of the translations use terms that mean "crew" – which is even narrower in meaning than "personnel" (which encompasses not only the crew, but also other service providers and professionals on board). The French version uses the word "l'équipage" where "personnel" is used in Article 2 and 3, while the Spanish version uses the term "la tripulación." The Russian and Chinese versions of the Rescue Agreement follow in the same vein. The Russian version uses the word "экипаж," which is simply a transliterated version of the French word "équipage" and carries the same meaning. Similarly, the Chi-

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80 International Law Commission, *supra* note 40, at 223; see also *Prosecutor v. Dusko Tadic*, [1999] ICTY 2, 124 ILR 61 at 183-84 (1999), para. 303 (stating that the "*travaux préparatoires...* may only be resorted to when the text of a treaty... is ambiguous or obscure.").

nese version employs the word “yen ruan” which also translates as “crew.”

Even if all of the previous arguments fail, we are left with a final possibility – that the ordinary meaning of “personnel” results in absurdity under Article 31 of the Vienna Convention, thereby allowing recourse to travaux préparatoires (such as the comment from the Italian delegation reproduced above) that support an interpretation that would include tourists. However, it is first necessary to establish that the use of the term “personnel” results in absurdity – which is not difficult to do. Imagine, for example, that one of Virgin Galactic’s spaceplane crashes in stormy waters just off the coast of a foreign country. Under a narrow reading of “personnel,” the nearby state would be required to rescue the pilot and other crewmembers, but would be free to leave the passengers to face their destiny on the high seas. This scenario could not have been contemplated by the drafters of the Rescue Agreement since there is no reason why the duty to rescue would be limited in this way. Once the rescue expedition had reached the spacecraft, there is no sense in only rescuing some of the people in danger, but not others. This is a ridiculous scenario that would support a finding of absurdity. Facing such absurdity, the ICJ would be forced to remedy the flawed language of the Rescue Agreement by giving “personnel” a broader meaning that would encompass space tourists.

IV. THE WAY FORWARD: REFORMING THE LAW TO BENEFIT SPACE TOURISM

The purpose of this article is not merely to describe the current state of law regarding the rescue of astronauts and the return of spacecraft. Although there is value in informing existing tourism companies of the contours of existing law and how the law can benefit their operations, this study was also undertaken in order to identify those aspects of the current law that need to be reformed in order to meet the needs of the private space in-

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82 Other commentators have noticed the absurdity of this situation. See, e.g., Freeland, supra note 74, at 10; Beckman, supra note 59, at 88.
dustry. Those issues that demand further clarification, or are in need of more substantial reform, include the following:

1. Does the duty to rescue and return apply to commercial ventures?
2. Is there a duty to rescue passengers?
3. Is a suborbital spacecraft a “space object”?
4. Should the requirement under the Rescue Agreement that personnel “alight” prior to the rescue duty being triggered be abolished?
5. Does the duty to rescue and return apply during all stages of flight?
6. What is the definition of “launching authority”?
7. Should expenses for rescue be reimbursed?
8. Should the notification requirement under Art. 5 of the Rescue Agreement be expanded to include notification regardless of where the accident occurs?
9. Should the duty to return be triggered by the request of a private party?
10. Should spacecraft design standards be implemented to facilitate rescue?

Before recommending specific solutions to these issues, it is instructive to observe the work product of three leading figures of space law, Prof. Karl-Heinz Böckstiegel, Prof. Stephen Gorove, and Prof. Vladlen Vereshchetin, who joined efforts in 1988 to write the Draft for a Convention on Manned Space Flight (the “Draft Convention”), which was an attempt to create a new body of rules to address the perceived needs of future space industries.\(^3\) Given the usefulness of this draft convention as a source of ideas, the entire text of Article VI of the convention, addressing the rescue of astronauts, is reproduced here:\(^4\)

\(^3\) MANNED SPACE FLIGHT, supra note 2, at 7.
\(^4\) Id. at 11.
Article VI Mutual Assistance in Space

1. In accordance with Art. V of the Outer Space Treaty and the respective provisions of the Rescue Agreement, the crew participating in a manned space flight of a State Party to this Agreement shall render all possible assistance, including, if necessary, the provision of shelter on their manned space objects, to persons who are experiencing conditions of distress in outer space or on celestial bodies.

2. To facilitate such assistance, the States Parties to this Agreement shall study and exchange information on possible steps to ensure the compatibility of manned space objects and technical means for carrying out rescue operations in outer space.

3. Any information received by a State Party to this Agreement concerning an emergency on a manned space object of another State shall be immediately transmitted to the launching State and to the Secretary-General of the United Nations in accordance with Art. I of the Rescue Agreement so that any State may come to the rescue of the persons experiencing conditions of distress.

4. In the event of an emergency situation arising on a manned space object, the States Parties to this Agreement shall ensure by all possible means that communication to and from the manned space object in distress shall be available and that they shall not interfere with such communication.

5. Unless otherwise agreed by the States Parties concerned, the expenses incurred by a State Party or by another State in rendering assistance to a manned space object in distress shall be borne by the launching State of that object, if the launching State has been informed in advance of the assistance and has not objected.

6. States shall regard any person in outer space as an astronaut within the meaning of Art. V of the Outer Space Treaty and as part of the personnel of a spacecraft within the meaning of Art. VIII of the Outer Space Treaty and the Rescue Agreement.
The Draft Convention has been the most comprehensive attempt to reform existing space law in order to accommodate the needs of a private spaceflight. Nevertheless, however progressive this Draft Convention may be, it is not the final word on space law reform. In some cases, the provisions of the Draft Convention provide valuable guidance, while in other cases it falls short. However, even in its shortcomings the Draft Convention has proved to be helpful in the formation of the following recommendations.

1. The extension of the duty to rescue and return to commercial ventures should be made explicit. Although I have argued above that the existing duty to rescue and return applies to commercial ventures, private companies will want clarity on this point. Clarity can be provided by reforming the law to make explicit that the rights, duties, and obligations contained in the treaties apply to commercial ventures. Although no such explicit statement is contained in Article VI of the Draft Convention regarding mutual assistance, the Draft Convention does propose to extend liability to states for damage caused by any of its space flights “irrespective of whether they are carried out by governmental or non-governmental entities.”85 This language is a useful model for how obligations under the existing law of rescue and return can be extended to cover private ventures. However, care must be taken when drafting this language. If the language is overly broad and extends all duties and obligations contained in the Rescue Agreement to private entities this would have the effect of requiring private companies to engage in rescue operations themselves. The duty of private parties to engage in rescue missions would potentially place a great burden on companies that are already subject to great financial pressures. In Article VI, the Draft Convention extends the duty to rescue to the crew of a spacecraft – thus requiring not only states to mount rescue expeditions, but requiring the pilots and crew of any spacecraft to engage in rescue operations if possible. This debate regarding the extension of the duty to rescue to private parties was recently taken up in two papers delivered at

85 MANNED SPACE FLIGHT, supra note 2, at 12.
the 2008 International Astronautical Conference in Glasgow and is adequately handled there. However, in this early phase of the space tourism industry, the question of whether private parties can benefit from the duty to rescue is more important than whether the duty to rescue should be imposed on private parties.

2. "Astronaut" and "personnel" should be defined to include passengers. Although there are strong arguments that the terms "personnel" and "astronaut" should be interpreted under the Vienna Convention to include passengers, it would be preferable to make the scope of the duty clear by stating explicitly that states must rescue all persons on board a spacecraft. This could be achieved simply by clarifying that the duties set forth in the Outer Space Treaty and the Rescue Agreement apply to all persons on board a spacecraft — as is stated in Article V(6) of the Draft Convention.

3. The definition of "space object" should be clarified. A threshold question that must be resolved to ensure that suborbital tourism companies will be able to benefit from current space treaties is whether suborbital spacecraft will be deemed to be "space objects" under the Outer Space Treaty and "spacecraft" under the Rescue Agreement. Virgin Galactic and the other suborbital tourism companies will be sending their tourists 100 kilometers above Earth, which is widely acknowledged to be the lower limits of space — since it crosses the so-called Karman Line. However, the question of where space begins has been the subject of a long-running debate that has yet to be resolved. Some would argue that space begins significantly higher than the Karman Line. For example, the national laws of some countries recognize space as beginning at an altitude where orbit can

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be sustained. Settling this question is of great importance to the suborbital tourist industry in order to ensure that suborbital flights come within the protection of the duty to rescue and return. This can be achieved by making clear that space begins at 100 kilometers above sea level. Under such a definition of space, suborbital vessels would be treated as “space objects” and “spacecraft.”

4. The requirement under the Rescue Agreement that personnel “alight” prior to the rescue duty being triggered should be abolished. As explained above in Section II, the language of the Rescue Agreement requiring that the personnel “alight” prior to the rescue duty being triggered may be interpreted to rule out any duty to rescue personnel traveling in space. In order to remedy this gap in the treaty, the law should be reformed to provide for rescue when persons aboard a spacecraft are in distress (or, to state this duty even more broadly, whenever persons on board a spacecraft or elsewhere in space are in distress – for example, if tourists are stranded in a lunar hotel).

5. The duty to rescue and return should apply during all stages of flight. Since it is likely that a mishap involving a suborbital flight could occur before the vessel reaches space, resulting in an unplanned landing in a foreign territory, the duty to rescue and return must be revised in a manner that allows for the duty to be triggered even if the spacecraft never reaches space. The Draft Convention attempts to broaden the duty to rescue in this manner by defining “manned space flight” in the following way:

[A] flight of a space object with a person or persons on board from Earth to outer space or in outer space and extends to the embarkation, launch, in orbit, deorbit, reentry, landing and disembarkation.

While the intent of the drafters is clearly that the duties of the convention apply to all stages of a flight, there is still room to question this conclusion if the definition of “space object” or “spacecraft” does not explicitly state that such term includes an

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88 MANNED SPACE FLIGHT, supra note 2, at 8 (emphasis added).
object or spacecraft that does not achieve outer space. None of the existing conventions define spacecraft or space object – except for the Liability Convention which defines space object as including “component parts of a space object as well as its launch vehicle and parts thereof,” which definition fails to address the issue at hand. 89 Article 5 of the Rescue Agreement also fails to resolve the issue by stating that the duty to return applies to “objects launched into outer space,” which suggests that objects that are intended to reach outer space but fall short of this goal will not benefit from the duty to return. 90 Nor does the Draft Convention sufficiently handle the issue in its definition of “manned space object” which is defined as “a space object on which a person or persons effect a space flight.” 91 This definition suggests that only objects which have “effected” a space flight (i.e., have reached outer space) are subject to the treaty. One solution would be to adopt a definition of “space object” and “spacecraft” that would include those objects that were launched into space as well as those objects that were launched with the intention of reaching space, but failed to do so.

6. The definition of “launching authority” should be clarified. The “launching authority” plays a central role in the operation of the Rescue Agreement in a number of ways. For example, notification regarding an unintended landing is to be given to the launching authority, personnel and errant spacecraft are to be returned to the launching authority, and the expenses of salvage are to be borne by the launching authority. 92 However, there are significant problems with the definition of “launching authority” in light of the multi-national and supra-national nature of current space operations. Before highlighting these problems, the following definition of “launching authority” set forth in the Rescue Agreement should be considered: 93

[T]he term “launching authority” shall refer to the State responsible for launching, or, where an international intergov-

89 Liability Convention, supra note 58, at art. 1(d).
90 Rescue Agreement, supra note 16, at art. 5(3).
91 MANNED SPACE FLIGHT, supra note 2, at 8.
92 Rescue Agreement, supra note 16, at arts. 1, 4 & 5.
93 Id. at art. 6.
ernmental organization is responsible for launching, that org-

In short, the Rescue Agreement defines "launching authority" as the state that is "responsible for launching." The problem with this definition is that a state may not qualify as being "responsible for launching" a space object when the space venture is private in nature. The analysis is further complicated if a launch takes place in extra-jurisdictional territory, such as the high seas. In order to avoid these complications, the definition of launching authority should be clarified so that no doubt will arise regarding the state that is subject to the duties and benefits of the treaty. The simplest solution would be to define launching authority as the state that has registered the space object under the Registration Treaty. 94

7. Expenses for rescue should be reimbursed. Perhaps the clearest indication of the humanitarian nature of the Rescue Agreement is that there is no requirement for the launching authority to reimburse a rescuing State for the costs of a rescue operation. Although the sentiment is commendable, this lack of a compensation requirement could in the end hamper rescue efforts since the duty to rescue is only triggered if a State is "in a position to do so." 95 The danger is that a State may take finances into consideration when deciding whether it is in a position to undertake rescue operations – particularly if space rescue is demanded. As a result, it would be in the best interests of the space industry to require the reimbursement of funds spent on rescue, just as the costs of retrieving a spacecraft are to be borne by the launching authority. Whether a State will then demand that such costs be subsequently reimbursed by the private company that received the benefits of the rescue should be left to domestic law. 96

8. The notification requirement under Art. 5 of the Rescue Agreement should be expanded to include notification regardless

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94 For an example of an early debate on this issue see the joint comment by Australia, Canada, and the USSR see Proposals, amendments and other documents relating to assistance to and return of astronauts and space vehicles, supra note 79, at 12.
95 Rescue Agreement, supra note 16, at art. 3.
96 See Comer, supra note 86; O'Brien, supra note 86, at 8-9.
of where the accident occurs. The sharing of information about an emergency involving a spacecraft is imperative to ensure that rescue operations are quickly dispatched and that any developments in the situation are transmitted to all parties involved during the course of rescue and retrieval of a spacecraft. While Articles 1 and 2 the Rescue Agreement requires a State to notify the launching authority upon learning of personnel of a spacecraft being in distress — regardless of where the spacecraft is located — and to provide updates regarding any rescue operations, this notification requirement is curtailed with respect to retrieval operations.\(^97\) Under Article 5, notification about the discovery of an errant spacecraft is only required if the spacecraft or its component parts has returned to Earth.\(^98\) This duty to notify should be expanded in two ways. First, the duty to notify should be expanded to require the sharing of all information with the launching authority regarding the discovery of an errant spacecraft (similar to the language used in Article VI(4) of the Draft Convention). Second, the duty should be expanded to cover the sharing of information regarding errant spacecraft regardless of where the spacecraft is located — on the Earth, in space, or on a celestial body.

9. The duty to return should be triggered by the request of a private party. As currently drafted, Article 5 of the Rescue Agreement only requires a State to retrieve an errant spacecraft upon the request of the launching authority. This provision should be revised to allow this duty to be triggered either upon the request of the launching authority or the owner of the spacecraft. This would enable recovery operations to be launched more quickly without the private owner of a spacecraft having to go through governmental channels in order to request recovery.

10. Spacecraft design standards should be implemented to facilitate rescue. Although rescue operations involving suborbital flights are likely to involve nothing more than locating and recovering the spacecraft when it has returned to Earth, rescue will be more complicated in those situations where spacecraft

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\(^{97}\) Rescue Agreement, supra note 16, at arts. 1 & 2.

\(^{98}\) Id. at art. 5(1).
face emergencies in orbit, in deep space, or on a celestial body. In those cases, it may be necessary for a rescue vehicle to dock with the vehicle in distress so that the people on board can be transferred to the rescue vehicle and returned to Earth. In order to facilitate such space rescue operations, it would be helpful if hatch design were standardized to allow for docking between all spacecraft. This could be achieved through an international instrument that requires the domestic laws of signatories to impose a standard design such as the Common Berthing Mechanism that is used by vehicles that dock with the International Space Station. While Article VI(2) of the Draft Convention calls for such compatibility of spacecraft, it does so with soft language that merely requires parties to “study and exchange information on possible steps to ensure the compatibility of manned space objects.” It would be preferable to draft stronger language that would require parties to comply with a specific design standards, such as the Common Berthing Mechanism, or a variable standard that is determined by an international working group formed by a treaty for the express purpose of developing such standards.

Apart from the challenge of determining what substantive changes should be made to the current law regarding rescue and return, there is also the question of how best to go about making these changes. One possibility is to amend the Rescue Agreement pursuant to the amendment procedures set forth in Article 8 which states that (1) any State may propose an amendment and (2) any proposed amendment shall enter into force upon the acceptance of the amendment by a majority of States that are party to the Rescue Agreement (but shall only bind those States that accept the amendment). However, this procedure sets a high bar for modifying the law since it would require the assent of forty-five countries – a task that would likely take many years to achieve even a single country.

99 MANNED SPACE FLIGHT, supra note 2, at 11.
100 Rescue Agreement, supra note 16, at art. 8.
would be bound by the amendments. In light of this, the preferable approach would be to draft a separate agreement or protocol containing provisions that would set forth new obligations. This protocol could be drafted in a manner that referenced the Rescue Agreement and stated that the obligations under the Rescue Agreement would be modified as set forth in the protocol. More importantly, the protocol could be drafted in a manner that would allow it to enter into force upon the ratification by two or three countries, thus permitting the changes to go into effect within a short period of time. Of course, the protocol would only be binding on those states that ratified it and it might still take many years before broad ratification were achieved – but at least there would be rather immediate implementation of the changes with respect to those countries that ratified the protocol early on.

V. CONCLUSION

Virgin Galactic and the other space tourism companies will be pioneers in the next era of human spaceflight. In the early phase of their operations, these companies will face many technological, financial, and regulatory challenges – but the greatest challenge overall will be ensuring the safety of their customers. Passenger safety is a multi-faceted problem that will require safe technology, the proper training of the flight crew, as well as passenger screening and training. In the event that an emergency arises during flight, the ability of a company to rescue its passengers will also be of great importance for the survival of not only the passengers, but of the company as well. In order to assist companies in providing for the safe rescue of their passengers, this article has shown that a strong argument can be made that the Rescue Agreement requires parties to the treaty to rescue space tourists. In addition, this article has shown that the Rescue Agreement requires states to recover and return private spacecraft, including spaceplanes used to ferry tourists into space.

The duty of States to rescue space tourists and return private spacecraft should be taken into account by companies as they create their contingency plans for the rescue of their cus-
tomers and the retrieval of their spacecraft. While some operations, such as Virgin Galactic's suborbital flights out of New Mexico, are not likely to result in an unintended landing in foreign territory, other companies may be operating in an international environment. For example, Rocketplane's plans to launch suborbital flights from Dubai could result in unintended landings in Iranian waters. Companies, such as Rocketplane, that face the possibility of losing a spacecraft in foreign territory should consider notifying the country prior to launch regarding their duties to rescue the passengers and return the spacecraft in the event of an accident. Alternatively, a company should be prepared to demand that states adhere to their duty to rescue and return in the event that an accident takes place. This article provides the legal framework for such a demand. In the meantime, the law regarding rescue and return should be reformed as recommended herein so that in the future space tourism companies will be able to operate in a legal environment that ensures the safety of their customers and prevents the misappropriation of their spacecraft.