What is the current and what could be the prospective legal regime for non-orbital flights?

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INTRODUCTION

A non-orbital or suborbital flight is a flight in which a vehicle reaches a very high altitude, usually considered as the limit of outer space, without completing a full orbital revolution.¹ Non-orbital flights can be used for different purposes ranging from space tourism to astronaut training, the performance of scientific experiments and even point-to-point travel between distant places on earth. In 2004 SpaceShipOne completed the first manned private spaceflight, thereby proving that private companies are capable of bringing a person to the edge of space and back again. Today, more than 10 years later, several companies are developing their own non-orbital flight vehicles but none of them have introduced their services to the market.² Nevertheless, the real question on everyone’s lips remains how this market will be regulated. Non-orbital flight is a hybrid activity at the edge of air law and space law for which only one country has issued specific regulation so far.³ Consequently, the industry suffers from a climate of legal uncertainty that negatively impacts investment and which in turn delays development.

This essay will start by identifying the policy objectives that should be implemented through a legal regime of non-orbital flights. The second chapter discusses the basic rules of the only existing lex specialis on this topic, the US regime for private manned spaceflight. The essay continues with an overview of the major legal obstacles that arise when trying to apply the existing international rules of air or space law to non-orbital flights. Chapter four presents the basis for a future legal regime for the industry, which is then further developed in the fifth and sixth chapter.

1. POLICY OBJECTIVES UNDERLYING REGULATION

Market regulation finds justification in its underlying objectives, which are generally concerned with correcting market failures.⁴ This chapter identifies the specific policy objectives that exist for a legal regime for non-orbital flights.

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¹ International Civil Aviation Organization, Concept of Suborbital Flights: Information from the International Civil Aviation Organization 2 (2010).
² In a 2012 report, the Tauri Group analysed demand for Suborbital Reuseable Vehicles (SRV’s) in 8 markets. Source: Tauri Group, Suborbital Reuseable Vehicles: A 10 Year Forecast of Market Demand, 2 (2012)
Although companies developing vehicles for non-orbital flight have made significant progress since 2004, they haven’t reached the finish line just yet. Regulation should therefore encourage continued development of the industry.\(^5\) To this end, it must remain limited and flexible. Extensive regulation burdens companies with compliance costs and stifles innovation, thereby preventing the progress needed for any viable industry. A second objective is that of legal certainty, which is an objective *an sich* but also helps to achieve the first goal of fostering development. Legal certainty attracts investors, customers and market participants. Any legal regime should therefore be clear and include concrete rules.\(^6\) From the perspective of limiting externalities, introducing safety standards is vital. Non-orbital flights necessarily involve a certain amount of risk and entail the possibility of large-scale accidents and damage to man, property and environment. Regulation must ensure that public safety is guaranteed to a sufficient extent.\(^7\) Finally, the international aspect of this industry must be kept in mind. Although the use of non-orbital flights for point-to-point transportation is still only a futuristic idea, legislators must aim for the interoperability of legal regimes since this will benefit the industry from the start.\(^8\)

### 2. Current Legal Regime: The United States

In 2004, after SpaceShipOne performed the first commercial suborbital flight, the U.S. Congress decided to amend the Commercial Space Launch Act (hereafter named “CSLA 2004”) in order to promote development of “the emerging commercial human space flight industry”.\(^9\) To this day, the CSLA 2004 remains the only piece of legislation in the world specifically addressing the matter of commercial suborbital flight.\(^10\) The fact that the U.S. chose to incorporate the activity of non-orbital flights in its legislation for spaceflight is noteworthy in view of the discussion regarding the applicability of air or space law to the subject. It means they decided not to consider such flights as a form of aviation requiring


\(^7\) Michael Chatzipanagiotis, *Regulating suborbital flights in Europe: selected issues*, November 2012, 6-7. (Also, see the example of Virgin in Sweden, later or explain here?)

\(^8\) An example of this is the case of the U.S. based company Virgin Galactic that is interested in operating from the Swedish spaceport in Kiruna. This is explained more in detail in point 5.3.


regulation under air law.\textsuperscript{11} This debate is treated in the following chapter. The present chapter looks at the US regulation to provide an overview of the current legal regime for non-orbital flights.

The CSLA 2004 is the second amendment of the original 1984 Commercial Space Launch Act, which created a licensing regime for private space launches. This regime requires private companies with U.S. nationality or launching from U.S. territory to secure a licence for each intended individual launch. A comparable obligation was enacted for private companies wishing to operate a launch site within the United States. The licences were made dependent upon fulfilment of a number of conditions and licensing power was vested in the newly established Office of Commercial Space Transportation (AST), which since 1995 is an Office within the Federal Aviation Administration (FAA/AST).\textsuperscript{12}

The regulatory framework created by the CSLA 2004 is shaped by two main policy objectives. The first objective can be found in the mission of the FAA/AST, which is to “ensure protection of the public, property, and the national security and foreign policy interests of the United States during commercial launch or reentry activities, and to encourage, facilitate, and promote U.S. commercial space transportation.”\textsuperscript{13} The second objective is to foster growth and innovation through limited regulation.\textsuperscript{14} Congress managed to balance these interests by building on the existing licensing regime.

It should be mentioned that safety oversight - the primary responsibility of the FAA/AST - could be realized through either a certification regime or a licensing regime. Certification is the process of confirming specific characteristics regarding all aspects of non-orbital flights. However, when a certain facet of non-orbital flights is required to meet specific prescriptions, innovation with regard to that facet is no longer possible. Still, on-going innovation is essential for this to become a viable commercial industry. So while certification works in case of mass-production of vehicles, it is not fit for the emerging industry of commercial suborbital flight.\textsuperscript{15} A licensing regime on the other hand sets safety objectives

\textsuperscript{11}Frans G. von der Dunk, \textit{Legal aspects of private manned spaceflight} in \textit{HANDBOOK OF SPACE LAW}, 683-684 (Frans G. von der Dunk with Fabio Tronchetti eds., 2015).


\textsuperscript{14}Michael C. Mineiro, \textit{An intersection of air and space law: licencing and regulating suborbital commercial human space flight operations}, 22 AIR & SPACE LAW, 2 (2010).

without specifying how these should be reached. This allows for more flexibility but still ensures public safety by combining it with an extensive compliance monitoring system.\textsuperscript{16}

For these reasons, the FAA/AST favours a licensing regime over certification in the budding sector of commercial suborbital flights. It has established a range of performance-based requirements that are enforced through a strict compliance monitoring system.\textsuperscript{17} To obtain a license, applicants must among others go through a pre-application consultation, satisfy a public safety review, show compliance with human space flight regulations, satisfy environmental impact requirements, give information concerning maximum probable loss and receive approval from an interagency policy review.\textsuperscript{18}

The AST has not been granted the competence to regulate the safety of the people on board of non-orbital vehicles. Instead, a regime of “informed consent” was put in place. Both crew and spaceflight participants must be informed of the risks involved in the activity. Spaceflight participants are furthermore required to provide written informed consent to take part in the launch and re-entry. In 2006, the AST has issued regulations incorporating these requirements.\textsuperscript{19}

The U.S. Congress also expressed the view that regulatory standards concerning human space flight must evolve with the development of the industry. So far, no changes have been made or announced.\textsuperscript{20} This is unsurprising, given the fact that no commercial sub-orbital flights have been undertaken since the CSLA was adopted in 2004.

3. APPLICATION OF INTERNATIONAL AIR LAW AND INTERNATIONAL SPACE LAW: LEGAL OBSTACLES

Since no other country has enacted specific legislation on the subject, we must take recourse to general rules of international law to know the legal regime governing non-orbital


\textsuperscript{17} On the FAA website the following is stated: “The FAA issues a commercial space transportation license or experimental permit when we determine that your launch or reentry proposal, your proposal to operate a launch or reentry site, or your proposal to test equipment, design or operating techniques will not jeopardize public health and safety, property, U.S. national security or foreign policy interests, or international obligations of the United States.” (Source: Office of Commercial Space Transportation, http://www.faa.gov/about/office_org/headquarters_offices/ast/licenses_permits/, accessed 12/10/2015.)

\textsuperscript{18} Michael C. Mineiro, \textit{An intersection of air and space law: licencing and regulating suborbital commercial human space flight operations}, 22 \textit{Air \& Space Law}, 2 (2010).

\textsuperscript{19} George Nield, Nathan Johnson, Jim Duffy & John Sloan, \textit{Informed consent in commercial space transportation safety}, 64\textsuperscript{th} International Astronautical Congress, IAC-13-D5.1.4, 2 (2013).

\textsuperscript{20} George Nield, Nathan Johnson, Jim Duffy & John Sloan, \textit{Informed consent in commercial space transportation safety}, 64\textsuperscript{th} International Astronautical Congress, IAC-13-D5.1.4, 1 (2013).
flights outside the United States. As mentioned in the introduction, non-orbital flights are a hybrid activity that combines elements of both aviation and space activities, two domains covered by an extensive body of international law. The question thus arises which of these regimes is applicable to the activity of commercial non-orbital flights.

This issue of applicability of international air or space law is relevant for multiple issues. First, it determines the jurisdictional aspects of the regime. Second, the question is also important with regard to issues of liability, insurance and registration, etc.\(^{21}\) Unfortunately no straightforward answer can be given on the matter of applicability of air or space law. This leads to a major lack of legal certainty that is harmful for the industry. This chapter provides an overview of the specific legal obstacles causing the ambiguity.

3.1 DELIMITATION OF THE BORDER BETWEEN AIR SPACE AND OUTER SPACE

The current uncertainty largely stems from the lack of a clear delimitation of a boundary between air space and outer space. This issue has been on the agenda of the Legal Subcommittee of the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS) for decades, with the Committee even setting up a Working Group on Matters Relating to the Definition and Delimitation of Outer Space, alas unsuccessfully.\(^{22}\) Significant to the debate was that Australia implied a vertical limit to its national sovereignty by establishing that its national space activities occur or may occur above 100 km of altitude. However, the implication of this decision was reduced when other countries came up with different solutions, depending on their national interests. If the border between air space and outer space would differ so greatly between countries, the international cooperation that is essential in space activities would become a huge challenge and progress in the area would abate.\(^{23}\)

There are two main theories addressing this issue: the spatial theory and the functional theory. Spatialists propose to fixate the boundary by international convention, and generally agree on a border at around 100 km above sea level. Although this option provides clarity and legal certainty, it also leads to the application of two legal regimes to the same flight. The spatialist theory is therefore not optimal with regard to the activity of non-orbital flight.\(^{24}\)

\(^{21}\) For an extensive analysis, see: Michael Chatzipanagiotis, *Regulating suborbital flights in Europe: selected issues*, November 2012.


According to the functional theory, the function and objective of the flight activity should form the decisive element for applying air law or space law. If a flight is intended to reach outer space, the law of outer space is applicable, while for example point-to-point transportation by way of non-orbital flights would fall under air law. This way, functionalism applies only one single regime throughout the flight. Still, it is not a viable solution because the theory is unclear and inconsistent.\textsuperscript{25} We can then wonder whether such a border has not yet been established through international customary law. Analysis of this hypothesis shows that there is indeed a rule of customary international law stating that the lowest altitude of orbiting satellites - around 100 km above sea level - forms part of outer space. But this does not equal answering the question as to where outer space ends and airspace begins. On the latter issue, no customary rule can be observed.\textsuperscript{26}

3.2 DEFINITION OF AIRCRAFT AND SPACE OBJECT

In some cases, applicability of air law or space law depends on the vehicle in question being classified as a space object or an aircraft.\textsuperscript{27} Here too, a spatialist and a functionalist approach can be discerned. Spatialists argue that a vehicle is subject to air law in air space and to space law in outer space. For functionalists, the determining factor is not the location of the vehicle but the purpose or function of the activity.\textsuperscript{28} Vehicles for non-orbital flight are at the heart of this debate for two reasons. First, they showcase the need for a clear definition of the concepts of aircraft and space object in international law because they usually combine elements of both. Today, neither of these terms has been sufficiently defined in international law and their interpretation according to the 1969 Vienna Convention on the Law of Treaties gives rise to a lot of uncertainty. This is shown by the fact that the UNCOPUOS Legal Subcommittee has not been able to agree on a definition of the term “space object”.\textsuperscript{29} Second, there is a broad variety in types of suborbital vehicles, from rocket-powered ones to one or two-stage hybrid vehicles. This makes them difficult to categorize and renders the need for

\textsuperscript{25} Michael Chatzipanagiotis, \textit{Regulating suborbital flights in Europe: selected issues}, November 2012, 15.
\textsuperscript{26} Michael Chatzipanagiotis, \textit{Regulating suborbital flights in Europe: selected issues}, November 2012, 16-18.
\textsuperscript{27} Article 1 (d) of the Convention on International Liability for Damage caused by Space Objects defines a space object as follows: “The term “space object” includes component parts of a space object as well as its launch vehicle and parts thereof.” This is not a clear definition. The term aircraft is mostly used in the sense of the Annexes to the Chicago Convention that define it as “any machine that can derive support in the atmosphere from the reactions of the air”.
\textsuperscript{28} Jinyuan Su, \textit{The delimitation between airspace and outer space and the emergence of aerospace objects}, 78 J. AIR L. & COM. 319, 367-368 (2013).
clear definitions even more pressing. So far, analysis of the subject does not produce a uniform answer.\textsuperscript{30}

3.3 (NOT) ADDRESSING THESE LEGAL OBSTACLES

During the past decade, legal researchers have consistently identified the issue of applicability of air or space law as the key obstacle in drafting a regulatory framework for non-orbital flights. Many suggestions were made on how to resolve the matter but none of them succeeded. The history of debate on the issue within the UNCOPUOS demonstrates how difficult it is to come up with an internationally accepted solution.\textsuperscript{31} Therefore, the legal framework presented in the following chapters does not address this issue. The budding industry of non-orbital flights needs a clear-cut framework that will allow it to innovate and develop. In the present situation, this can only be done by putting the matters of the limit of outer space and the definitions of aircraft and space object aside.\textsuperscript{32}

4. REGULATING NON-ORBITAL FLIGHTS: \textit{DE LEGE FERENDA}

4.1 TWO KEY CONCEPTS: SPACE VISITS AND SPACE TRANSPORTATION

Starting point for the regulatory framework are the different purposes for participating in non-orbital flights. Market studies have identified several markets, the largest one being that of private human spaceflight for recreational purposes. This seems to justify use of the term “space tourism”. Still, non-orbital flights could also be used for conducting scientific experiments in microgravity and astronaut training. In the long run they may even be used as a new means of transportation.\textsuperscript{33} Legal scholars have therefore argued that the term “private spaceflight” is more fitting to describe the activity. Private spaceflight has been defined as “Flights of humans intended to enter outer space (a) at their own expense or that of another

\textsuperscript{30} Michael Chatzipanagiotis, \textit{Regulating suborbital flights in Europe: selected issues}, November 2012, 18-27.
\textsuperscript{32} One should not infer from this decision that those issues are trivial. Given the increase of private activities in space, the international community would certainly benefit from a definitive decision on the delimitation of outer space and a definition of a space object. The decision merely signifies that the current climate of legal uncertainty surrounding non-orbital flights is harmful for the industry and that addressing this uncertainty can no longer be left dependent on decisions in these decade-long debates. Source: Manfred Lachs, \textit{The Law of Outer Space: An experience in contemporary law-making}, 5 (2010); Olavo de O. Bittencourt Neto, \textit{The Elusive Frontier: Revisiting The Delimitation Of Outer Space}, 63rd International Astronautical Congress, IAC-12. E7.1.9, 11-12 (2012).
\textsuperscript{33} This is currently referred to as point-to-point transportation.
private person or entity, (b) conducted by private entities, or (c) both”.\(^{34}\) This definition will serve as the basis for the legal regime for non-orbital flights.

Starting from this definition, there should be not one, but two legal regimes for non-orbital flights. To this end, two categories of private spaceflight must be distinguished. Applicability of the distinct legal regimes will then be based upon each of these categories. The first category is that of “space visits”. Space visits are defined as “private spaceflight for all purposes, with the exception of that for the purpose of transportation from point A to point B”. The second category is that of “space transportation”, defined as “private spaceflight for the purpose of transportation from point A to point B”. Consequently, space transportation will always involve two spaceports: one for launch and one for re-entry.

4.2 DIFFERENCES BETWEEN SPACE VISITS AND SPACE TRANSPORTATION

The division into two separate legal regimes makes sense because the two categories represent inherently different types of activities that would not necessarily benefit from being regulated in the same way. Companies currently developing vehicles for non-orbital flights intend to use these creations for carrying out space visits, not for space transportation (yet). Space visits are negatively defined. They include any type of private spaceflight as long as it’s not for the purpose of transportation. In other words, that involves all flights where reaching the boundary of outer space is essential in order to fulfil the purpose of the flight. This holds true for a space tourist wanting to go to outer space for recreational purposes, as well as for an astronaut doing microgravity training or for a scientist wishing to conduct an experiment in microgravity. This also means that space visits can launch from and land on one and the same spaceport. Such visits would moreover be carried out on an on-demand basis, as opposed to offering them on a mass-scale.

Space transportation differs from space visits in three distinct ways. First of all, passengers using space transportation do not necessarily have the wish or the need to reach outer space. Their goal is to get from point A to point B and they only use space as a medium to reach their destination. Secondly, space transportation always involves arrival in a different spaceport than the one from which the flight took off. These spaceports will usually be situated in different countries, since space transportation will not be undertaken for travelling short distances where it would be more favourable to take the airplane. This leads to the third difference, which is the fact that space transportation will most likely not be a service that is

offered on an on-demand basis. As a means of transportation, it will have to compete with the well-established aviation industry in terms of price, convenience and flight time. To succeed in this effort, the industry for non-orbital flights will need to be far more developed. Competition will probably only be achievable if space transportation is offered as a form of mass-transportation, allowing costs to be reduced. This is in contrast with space visits, which will be carried out on an on-demand basis.

The next chapters will show why these differences warrant the drafting of separate legal regimes.

5. THE LEGAL REGIME FOR SPACE VISITS

5.1 NATIONAL LAW

Space visits can be conducted using only one spaceport for both launch and re-entry. The only border that would have to be crossed during such a flight is the one between national airspace and international outer space, meaning that international cooperation is not a *conditio sine qua non* for a legal regime concerning space visits. It is therefore suggested to develop the legal framework for space visits at the national level. This has several advantages compared to a regime of international law. First of all, an international regime requires the political will from several countries to install such a regime. Second, the countries involved must reach a political consensus on the content of the regime. Third, an international regime also requires the agreement of all contracting states on which international body should be competent to deal with such a regime. The choice would be between the ICAO, EASA, UNCOPUOS or even creating an entirely new body. This would then inevitably lead back to the discussion about the applicability of air law or space law, making an effective international agreement impossible in the short term. Making this a matter of national regulation is therefore a pragmatic decision. It also makes sense from a EU perspective, since article 189 TFEU expressly prohibits harmonisation of the space law regimes of the Member States.

5.2 SPACE LAW AS A BASIS

The regime for space visits should start by defining the key concepts of private spaceflight, space visits and space transportation and delimiting the scope of application.

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35 As the on-going discussions in the UNCOPUOS prove, this is often easier said than done.
36 Michael Chatzipanagiots, *Regulating the safety of suborbital flights in Europe: navigating through the labyrinth of competences of the EU, its member states and EASA*, 64th International Astronautical Congress, IAC-13-D6.1,1x17300, 1 (2013).
After this, the legislation should expressly declare the four main treaties of space law applicable to the activity of space visits, for the following reasons. To begin with, private space visits are non-orbital flights undertaken for the purpose of reaching outer space. Applying the law of outer space to such an activity seems logical. Furthermore, the rules on space law provide a relatively clear basic framework, if you disregard the issues of applicability. This makes them well suited for the activity of space visits. Since the industry is still in its infancy, it will benefit from the legal certainty that basic regulation would provide, but not from extensive and stringent regulatory obligations. Finally, private space visits will be performed on an on-demand basis, much like traditional space activities have always been carried out on the basis of individual projects.

In a nutshell, the basic international rules on space law when applied to space visits can be summarized as follows. Countries are internationally responsible for all national activities carried out in outer space, private as well as state activities. This entails the need for each country to authorize; monitor and control private space visits because they could give rise to international state responsibility and/or liability under the Outer Space Treaty and the Liability Convention. It also entails the obligation of registration of the vehicle for non-orbital flights, which in turn allows that state to maintain jurisdiction and control over the space object in question.

5.3 Following the American Example

The final element of the national legal regime for private space visits would be to elaborate on the existing space law framework where necessary, by following the example of the existing United States regime where possible. This means that with regard to safety oversight, a licensing regime should be put in place for both spaceport operators and launch and re-entry operations. The advantages of such a licensing regime over a certification regime, considering the current state of the industry, have already been mentioned in the

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37 For a more extensive analysis of the rules on space law that can apply to non-orbital flights see: Michael Chatzipanagiotis, Regulating suborbital flights in Europe: selected issues, November 2012
second chapter. Additionally, it also entails introducing a regime of informed consent for crew and spaceflight participants.

The suggestion to enact similar rules to those in the United States is based on two reasons. First of all, these rules have been carefully formulated to take into account the needs of a nascent industry while still providing a maximum level of public safety. Secondly, interoperability is very important and a lack of it could raise strong barriers for the further development of the industry. An example is the case of U.S.-based company Virgin Galactic, which is developing a non-orbital vehicle that would operate by default from the Mojave Air & Space Port in California. The company has however also expressed an interest in launching from Kiruna in Sweden. If Sweden were to implement an entirely different regime for non-orbital flights, that regime would at best pose a major compliance cost to Virgin Galactic, but at worst it would dissuade the company from conducting operations in Sweden altogether.41

In 2014, the United Kingdom government issued a report in which it considered following the legal regime of the United States when drafting legislation for this subject.42

5.4 UNCOPUOS RESOLUTION

Finally, it is advised to draft a resolution in the Legal Subcommittee of the UNCOPUOS that validates the aforementioned rules as the legal regime that should be applicable to space visits. If the UN General Assembly would adopt such a resolution, it would provide countries with an authoritative set of guidelines to follow when drafting national legislation.43 And although a resolution does not have any binding legal force, it also doesn’t require the same level of political will and consensus as are necessary to conclude a treaty. Such a resolution would above all contribute to the interoperability of the different national legal regimes.

6. THE LEGAL REGIME FOR SPACE TRANSPORTATION

Given the specific characteristics of the activity, it is expected that a regime for space transportation will require regulation on the international level, that it will lean more towards

41 Tanja Masson-Zwaan & Steven Freeland, Between heaven and earth: The legal challenges of human space travel, 66 ACTA ASTRONAUTICA 1597, 1601 (2010).
42 The final advice however was not to adopt the U.S. framework because this might not be in line with future EU developments. Source: Civil Aviation Authority, UK Government review of commercial spaceplane certification and operations, summary and conclusions, July 2014, 39.
43 Tanja Masson-Zwaan & Rafael Moro-Aguilar, Regulating private human suborbital flight at the international and European level: Tendencies and suggestions, 92 ACTA ASTRONAUTICA 243, 248 (2013).
air law - probably providing the ICAO and EASA with important roles to play - and that safety oversight will be based on a certification regime rather than a licensing regime.\textsuperscript{44}

However, by making the fundamental distinction between space visits and space transportation, the legislator acknowledges both the urgent need to create a legal framework for the first category and the present absence of such a need for the second category. Space transportation today is still little more than a futuristic idea. There are still so many variables surrounding the commercial exploitation and even surrounding the possibility of such a service that creating a regulatory framework is not yet desirable nor possible. Countries should keep an eye on future developments and establish legislation in due course.

CONCLUSION

Over the past decade, legal researchers have stumbled time and again over the question of whether to apply international air law or international space law to the activity of non-orbital flights. Instead of leading to a solution, this resulted in a growing climate of legal uncertainty affecting the sector. This essay presented a different way of drafting regulation for non-orbital flights by introducing a \textit{summa divisio} between space visits and space transportation. Taking this division as a starting point for regulation acknowledges the fact that these types of non-orbital activities are inherently different. This then allows the creation of different legal regimes tailored to the specific characteristics of each activity. Since space visits will become a service offered on the market in the near future, this issue demands immediate attention. Space transportation on the other hand is still mostly a long-term vision for the future, so there is no need for establishing a legal regime just yet. It is contended that a legal framework governing space visits should be created on the national level, should expressly declare the treaties of international space law applicable to the activity and should elaborate on the basic rules of those treaties by enacting legislation similar to the existing U.S. regime on commercial human space flight. This pragmatic approach offers a feasible solution that can succeed in providing the sector of private non-orbital flights with legal certainty, while ensuring public safety and supporting international interoperability – the key objectives for any legal regime for non-orbital flights.

\textsuperscript{44} Paulina E. Sikorska, \textit{The mission (im)possible: towards a comprehensive legal framework regulating safety issues of point to point suborbital flights}, 21 JURISPRUDENCE 1055, 1055-1078 (2014).
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