

# Legal Brief on Commercial Space Flight Regulation

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## Abstract

*The submitted piece is a legal brief on the regulation of collisions of commercial space flight vessels with other space objects. It illuminates the inadequacy of current international treaties that regulate outer space exploration and explores the complexity of jurisdiction in outer space. The brief proposes a comprehensive liability scheme, the development of domestic regulation of commercial spaceships and the removal and the management of space debris to regulate collisions in outer space.*

## I. Introduction

Recent advancements in commercial space flight technologies demand international law instruments provide more comprehensive regulations on issues such as jurisdiction in space, liability for collision with other space objects and space debris. Up until the beginning of the twenty first century, space exploration was conducted predominantly by governmental entities, regulated largely under five main multilateral treaties finalised through the United Nations Committee on the Peaceful Uses of Outer Space (UNCOPUOS).<sup>1</sup> However, with the growth in non-governmental and commercial interest in the use of space such as Virgin Galactic and EADS Astrium,<sup>2</sup> questions arise of how the existing international law applies to these activities and what areas of international and domestic law require further development to meet these new interests. In this brief, there will be particular focus on how Article VIII of the *Treaty on the Principles Governing the Activities of the States in Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (Outer Space Treaty)*,<sup>3</sup> regulates commercial space flight, particularly in the case of collisions with other space objects.

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<sup>1</sup> Steven Freeland, 'Fly Me to the Moon? How Will International Law Cope with Commercial Space Tourism?' (2010) 11 *Melbourne Journal of International Law* 5.

<sup>2</sup> *Ibid* 3.

<sup>3</sup> *Treaty on the Principles Governing the Activities of the States in Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, open for signature 27 January, 1967, UNTS 205 (entered into force 10 October, 1967) ('*Outer Space Treaty*').

## II. Definitions and Background

### A. *Commercial Space Flight*

There is no clear international consensus of the border between air space and outer space.<sup>4</sup> Customary international law suggests that the Von Kármán line (one hundred kilometers above the Earth's sea level) is the boundary,<sup>5</sup> confirmed by the definition of outer space included in the draft document entitled *Treaty on the Prevention of the Placement of Weapons in Outer Space, the Threat or Use of Force Against Other State Objects*.<sup>6</sup>

Most commercial space flights offered will be suborbital, attaining an altitude of around one hundred kilometers and experiencing a few minutes of microgravity before returning to Earth, for the purpose of shortening travelling time<sup>7</sup>. Examples of commercial companies offering suborbital flights include Virgin Galactic with SpaceShip Two, Orbispace and Up Aerospace.

### B. *Article VIII of the Outer Space Treaty*

Article VIII of the *Outer Space Treaty* provides that

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

Contrary to airspace, customary international law precludes outer space from being subject to the territorial sovereignty of any States.<sup>8</sup> However, under Article VIII, States have ownership and jurisdiction over objects launched into space that have been registered in their country.

The rest of Article VIII establishes that space objects are not defined by their presence in outer space or on a celestial body or return to Earth. An ordinary meaning interpretation of 'object', in light of the object and purpose under Article 31 of the *Vienna Convention of the Law of Treaties*,<sup>9</sup> would determine a commercial space flight to be an 'object' under the *Outer Space Treaty*. The purpose of the treaty is to ensure the peaceful exploration of outer space for the benefit of mankind, applying to governmental and non-governmental activities.<sup>10</sup> Articles VI and VII of the treaty give States responsibility and liability for all space activities registered in their State. Thus, read in context with these provisions, it can be concluded

<sup>7</sup> Ferreira-Snyman, Above n 4, 12.

<sup>8</sup> Neger and Walter, above n 5, 239.

<sup>9</sup> *Vienna Convention of the Law of Treaties* 1969, 1155 UNTS 331.

<sup>10</sup> Above n 3.

that Article VIII is intended to give States jurisdiction over commercial objects launched into space, including space flight crafts. Whilst the treaty was drafted and negotiated well before the development of commercial space flight technologies,<sup>11</sup> there would be no reason not to expand its scope to apply to commercial space flights.

### III. Regulation of Commercial Space Flight

#### A. Article VIII and domestic legislation

Articles VIII and VI of the *Outer Space Treaty* pass the primary responsibility to States to regulate, authorise and supervise the activities of commercial space flight companies, under domestic legislation. States will want to heavily control commercial space flight activity conducted in their territory, as under Article VII of the Treaty they have international liability for damage to another State's object, persons or territory in the air or in outer space. As such, the United States and the European Union, the States of registry of the largest stakeholders in commercial space flight have proposed and adopted comprehensive domestic codes like the *US Commercial Space Launch Act*<sup>12</sup> to oversee, authorise and regulate the commercial spacecraft. Launch licenses, permits, safety approvals and licenses to operate space crafts are among the areas regulated by domestic legislation. The main aim of these domestic codes is to minimise risk of collision by ensuring safety protocols are met.<sup>13</sup>

Leaving the safety and environmental regulations entirely to the States may be problematic, as some countries with underdeveloped space tourism industries may use their low safety standards and regulations to attract commercial space flight companies.<sup>14</sup> The problem of 'flags of convenience' in the High Seas, may translate to outer space, which could create safety hazards for passengers and other space objects.<sup>15</sup> Whilst State sovereignty should be respected and each State should be able to regulate enterprises registered in their State, it is important to develop minimum safety guidelines of commercial space crafts under international law, especially whilst technology and space travel are in their early stages and still highly dangerous.

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<sup>11</sup> Freeland, above n 1, 95.

<sup>12</sup> *Commercial Space Launch Act of 1984*, 51 USC § 50901 (1984).

<sup>13</sup> Freeland, above n 1, 105.

<sup>14</sup> Adrian Taghdiri, 'Flags of Convenience and the Commercial Space Flight Industry: The Inadequacy of Current International Law to Address the Opportune Registrations of Space Vehicles in Flag States' (2013) 19 *Boston University Journal of Science & Technology Law*.

<sup>15</sup> Matthew J Kleiman, 'Space Law: An Introduction to Space Law' (2015, American Bar Association) <[http://www.americanbar.org/groups/young\\_lawyers/publications/the\\_101\\_201\\_practice\\_series/space\\_law\\_101\\_an\\_introduction\\_to\\_space\\_law.html](http://www.americanbar.org/groups/young_lawyers/publications/the_101_201_practice_series/space_law_101_an_introduction_to_space_law.html)>.

Article VIII of the *Outer Space Treaty* articulates a series of governing principles about ensuring the use and exploration of outer space is for the benefit of mankind.<sup>16</sup> However, it does not directly regulate commercial space flight activities, leaving this largely to the States. To find more comprehensive regulations of commercial space flight in international law, including liability schemes for collisions and space debris, the Department will need to look further than Art VIII of the *Outer Space Treaty*. The following part of the brief will outline other sources of international law that can be referred to for additional protocols, especially preceding a collision. Furthermore, working models of commercial space flight regulations in the US and the European Union can provide assistance to the Department.

## B. *In the Event of a Collision*

### 1. *Concurrent jurisdictions*

When there is a collision between two space objects of different nationalities, there are two jurisdictions involved, as provided by Art VIII of the *Outer Space Treaty*. However, the Treaty does not deal with the problem of which country should adjudicate the case, which State's legislation applies or whether it should be left to the International Court of Justice.<sup>17</sup> Articles VI and VII give States liability for objects launched into space by governmental and non-governmental activities. This suggests that most international space law disputes would be State against State and be resolved in the typical international law dispute settlement forums. However, with the rise in commercial and non-governmental entities interested in launch activities, States require avenues to bring claims against private entities whether they be within or outside their jurisdiction.<sup>18</sup>

This issue of concurrent jurisdictions in outer space can be possibly resolved by looking at the well-established body of law of the High Seas, which dates back to the 1926 *Lotus case*.<sup>19</sup> Like outer space, the High Seas are under no States' jurisdiction but ships are under their flag State's jurisdiction. Churchill RR and Lowe AV stated that:

<sup>16</sup> Timothy G. Nelson, 'Regulating the void: In-orbit collisions and space debris' (2014, Space Review) <<http://www.thespacereview.com/archive/2520.pdf>>.

<sup>17</sup> Randolph Cheeks, 'Liability for debris in outer space' (22 November 2013, *Jamaica Observer*) <[http://www.jamaicaobserver.com/business/Liability-for-debris-in-outer-space\\_15490079](http://www.jamaicaobserver.com/business/Liability-for-debris-in-outer-space_15490079)> .

<sup>18</sup> Frans von der Dunk, 'Space for Dispute Settlement Mechanisms- Dispute Resolution Mechanisms for Space?' (2001) *Space and Telecommunications Law Program Faculty Publications* 447.

<sup>19</sup> *S.S Lotus (France v Turkey)* (1927) 248 ICGJ ('*Lotus*').

Collisions may involve two States, each of which considers the collision and those responsible for it to be within its jurisdiction.<sup>20</sup> Existence of concurrent jurisdiction was upheld by the Permanent Court of International Justice in the case of the French ship *Lotus*, which had collided with a Turkish vessel.<sup>21</sup>

The *Lotus* rule has been heavily criticised and was reversed in the *International Convention for the Unification of Certain Rules relating to Penal Jurisdiction in Matters of Collision and Other Incidents in Navigation*,<sup>22</sup> and adopted in High Seas Convention,<sup>23</sup> which reserved proceedings to the State in whose ship the defendant is a national. The rationale behind this being that a State retains enforcement jurisdiction over its nationals, wherever they may be, with some exceptions. The principle that a defendant may only be sued in the courts of the country in which he resides, is a national of or has his place of business in, is a very old and well established one in maritime torts.<sup>24</sup> This rule could potentially be applied in commercial space flight collisions in the following types of disputes:<sup>25</sup>

*State versus private entity under their jurisdiction*

Whilst States are internationally liable, private entities are not precluded from liability under domestic law. If the State chooses to bring the private entity to their domestic court, the private entity would rely on their national law, under the *Brussels' Rule*.<sup>26</sup>

*State versus private entity not under their jurisdiction*

States may want to bring a claim against the private entity not within their jurisdiction. This may occur if a commercial space craft collides with a State's satellite or object or if a State's national suffers damage from a collision and the State chooses to exercise diplomatic protection. As per the *Brussels' Rule*, the State suffering damages would bring the claim to the private entity's national court and the defendant's national laws would apply.

## 2. Liability

<sup>20</sup> *Convention of the High Seas 1958*, 450 UNTS 11 art 6 ('*High Seas Convention*').

<sup>21</sup> Robin R Churchill and Alan V Lowe, *The Law of the Sea* (Manchester University Press, 2nd ed, 1988) 169.

<sup>22</sup> *International Convention for the Unification of Certain Rules relating to Penal Jurisdiction in Matters of Collision and Other Incidents in Navigation 1952* 439 UNTS 2333 ('*Brussels' Rule*).

<sup>23</sup> Above n 20.

<sup>24</sup> Sarah F Gahlen, *Civil Liability for Accidents at Sea* (Springer Heidelberg New York Dordrescht London, 2014) 279.

<sup>25</sup> Von der Dunk, above n 18.

<sup>26</sup> Above n 22.

Articles VIII and VII of the *Outer Space Treaty* alongside the *Liability Convention* create a complex liability structure, blending domestic and international law.<sup>27</sup> States are given legislative power to regulate their private, commercial space flight companies but when it comes to international liability for damages caused by collisions, States are responsible, not private entities. As noted above, States can bring cases against other States and possibly private entities but recourse for individuals may be limited. This is particularly problematic in the case of commercial space flight collisions, as private individuals will be the victims and lack judicial remedy in the international realm unless their State exercises diplomatic protection. Even in domestic courts, individuals would be significantly legally disadvantaged against large private entities or the State.<sup>28</sup>

An example from the United States Supreme Court illustrates the lack of domestic legal recourse and redress for citizens injured outside the United States territorial air space. In *Smith v United States*,<sup>29</sup> Mr Smith, who died in Antarctica, claimed his death resulted from the government's negligence, but his case was dismissed. This was on the basis that the United States had no subject matter jurisdiction over the issue that occurred in a foreign state, including the sovereignless state of Antarctica.<sup>30</sup> Whilst the *Outer Space Treaty* clearly articulates that States have international liability for their objects launched into space, there is no indication of domestic liability. Should an individual bring a case against their own State, domestic legislature may preclude liability from States. Courts may find, as the Court did in *Smith*, that outer space is also considered a 'foreign territory' and their enforcement jurisdiction does not apply. This calls for international guidelines on liability in domestic law for space collisions, to ensure individuals have remedies. Whilst international law was previously confined to States, there has been a recent drive for international law to protect individuals and smaller players, especially in these instances where States have significant advantage.

The current international liability scheme for damages caused by collisions in space is the *Convention on International Liability for the Damage Caused by Space Objects*.<sup>31</sup> Articles II and IV(a) of the *Liability Convention* requires absolute liability on the launching state for damage caused by a space object on the surface of the earth or to an aircraft in flight. Articles III and IV(b) establishes fault liability for damages caused by a space object in space. The Convention provides procedures for States to file claims against other States but not for an individual. The only forum available

<sup>27</sup> Joel F Stroud, 'Space law provides insights on how the existing liability framework responds to damages caused by artificial outer space objects' (2002) 37 *Real Property, Probate and Trust Journal* 363.

<sup>28</sup> Von der Dunk, above n 18.

<sup>29</sup> *Smith v United States* 507 US 197 (1993) ('*Smith*').

<sup>30</sup> *Federal Torts Claims Act*, 28 USC § 2680.

<sup>31</sup> *Convention on International Liability for the Damage Caused by Space Objects* 1972 961 UNTS 187 ('*Liability Convention*').

to private citizens is the 'Convention Claims Commission',<sup>32</sup> but private citizens still must petition their government to take their claims to this Commission.<sup>33</sup> Furthermore, this Commission is only to be used as a last resort, when all diplomatic means and alternative dispute settlements have been exhausted. Whilst the *Liability Convention* provides some framework for determining liability in the event of a collision, these avenues are predominantly for the States to use. With the growth of commercial space flight and space tourism industries, a larger body of international law providing remedies for individuals will need to be developed.

### 3. *Space debris caused by collision*

When there is a collision between a commercial space craft and a space object, there will be debris left behind, concentrated in the orbits where most human activity take place.<sup>34</sup> This area is becoming increasingly crowded with space craft and satellites and is also where the highest probability of collision lies, posing a real navigational hazard to space flight.<sup>35</sup> The *Outer Space Treaty* and the other international conventions pay little attention to environmental issues like space debris,<sup>36</sup> leaving most of this regulation up to domestic legislatures. One of the few sources of international law, which regulates space debris, is the Inter-Agency Space Debris Committee's Space Debris Mitigation Guidelines, but only requires voluntary compliance of States and is not legally binding under international law.<sup>37</sup>

There are several ambiguous areas in relation to space debris created by the *Outer Space Treaty* and the *Liability Convention*. Firstly, whether space debris is still considered an 'object launched by a State' and thus, if the State is liable for the damage caused by the debris and responsible for the removal.<sup>38</sup> Spacefaring states like the United States and Russia do not support the view that States are responsible, arguing that under the common heritage approach of space, space debris removal is a common responsibility<sup>39</sup>. In addition, the implications of granting legal liability to these States for space debris is large and comes with an enormous economic burden of developing technology to remove debris.

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<sup>32</sup> Ibid.

<sup>33</sup> Nelson, above n 16.

<sup>34</sup> Frans von der Dunk, *Handbook of Space Law* (Edward Elgar Publishing Limited, 2015) 720.

<sup>35</sup> Maureen Williams, 'Space Debris as a 'Single Item for Discussion' (2012) *Proceedings of International Institute of Space Law* 333.

<sup>36</sup> Taghdiri, above n 14.

<sup>37</sup> Ferreira-Snyman, above n 4, 10.

<sup>38</sup> Robert P Merges and Glenn H Reynolds 'Rules of the Road for Space?: Satellite Collisions and the Inadequacy of Current Space Law' (2010) 40 *Environmental Law Institute, Washington DC*, 10011.

<sup>39</sup> Michael Listner, 'Addressing the challenges of space debris, part 2: liability' (2012, Space Review) <<http://www.thespacereview.com/article/2204/1>>.

To impose obligations on States to remove space debris produced in the past could be too costly, however, States should take positive steps to reduce the chances of collisions and explosions through stringent safety guidelines and regulations through domestic legislation and ratifying international regulations for commercial flight.

#### IV. Conclusion

The *Outer Space Treaty* is still regarded as the most important international convention regulating the activities in space, including commercial space flight. Article VIII of the Treaty vests most of the regulatory power of commercial space flight ventures to the party States. Whilst spacefaring nations have risen and developed useful regional and national regulatory models, there are still many grey areas of space law for international law to colour. These include developing a means to address the removal and management of space debris, as well as a comprehensive liability scheme to assist individuals who are currently at the mercy of complex jurisdictional boundaries.

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