International Point-to-Point Suborbital Transportation: The Need for Global Governance

by

Ermanno F. Napolitano

Faculty of Law

Institute of Air and Space Law

McGill University, Montreal

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Abstract

The last decade has been characterized by the development of a nascent aerospace industry which seems ready to take off, the major point of interest being Point-to-Point (PTP) international suborbital operations. The current regimes of air law and of space law were established at a time when the possibility of hybrid aerospace activities was not envisaged, and the development of such aerospace operations poses many serious legal and practical questions that remain unanswered to this day. Suborbital vehicles seem to operate in both airspace and outer space, but it is unclear where, legally, airspace ends and outer space begins, and if, between the two, there is a "buffer zone" within which different laws apply. It is also unclear whether such vehicles are aircraft, space objects or aerospace objects. In brief, it is unclear which legal regime should apply to them and, from a legal point of view, this is not acceptable. As suborbital vehicles will use the same airspace as that traversed by aircraft, their proliferation would pose serious challenges, especially in terms of safety and liability. The thesis investigates the legal reasons and basis for ICAO to take a lead in developing new rules for aerospace activities through a proactive approach, which would serve to address the issue in the near term. Such approach serves as a basis for an evolutionary one for the long term. The key contribution of this thesis is to add a small chapter to the scientific literature supporting the passage from *lex lata* to *lex de ferenda* for the collectivity's benefit.

Résumé

La dernière décennie a été caractérisée par le développement d'une industrie aérospatiale naissante semblant être prête à décoller et dont le point d'intérêt majeur sont les opérations suborbitales « Point-à-Point » (PàP). Les régimes de loi aérienne et de loi spatiale furent établis à un moment où la possibilité d'activités aérospatiales hybrides n'était pas envisageable, et le développement de ces opérations pose plusieurs questions légales et pratiques d'une grande importance qui demeurent non résolues à ce jour. Les véhicules suborbitaux semblent opérer dans l'espace aérien et dans l'espace extra-atmosphérique, mais il n'est pas clair, légalement parlant, où l'espace aérien termine et où l'espace extra-atmosphérique débute, ou s'il y a une zone tampon dans laquelle différentes lois seraient appliquées. Il est aussi peu clair si ces véhicules suborbitaux sont définis comme aéronefs, objets spatiaux ou objets aérospatiaux. Bref, le choix du système légal qui leur est applicable est peu clair, et ceci est inacceptable d'un point de vue légal. Puisque les véhicules suborbitaux partageront l'espace aérien traversé par les aéronefs, leur prolifération posera de sérieux défis, tout particulièrement en termes de sécurité et de responsabilité légale. Ce mémoire examine, par le biais d'une approche proactive utile à court terme, les raisons et bases légales pour que l'OACI prenne les devants dans le développement de nouveaux règlements pour les activités aérospatiales. L'approche proactive proposée sert de base pour une approche évolutionnaire applicable au long terme. L'utilité principale de ce mémoire est de faire une petite contribution à la littérature scientifique supportant le passage de *lex lata* à *lex de ferenda* pour le bénéfice de la collectivité.

Introduction

The current regimes of air law and of space law were established at a time when the possibility of Earth-to-Earth (or Point-to-Point on Earth) international commercial sub-orbital operation for human transport was not yet envisaged. During the early development of international space law, very few operations such as that of the X-20 Dyna-Soar Program[1] and later of the X-15 Hypersonic Research Program[2] were capable of seemingly operating in airspace and at high altitudes, with the X-15, for example, reaching up to 107 km above mean sea level.[3] Nevertheless, such activities remained confined to their exceptional ambit and did not justify or envisage the need for a unified or integrated regime of air and space law.

On 21 June 2004, the first private manned spaceflight, attributable to Mr. Mike Melvill, who flew SpaceShipOne through a suborbital trajectory to reach an altitude of 100 km above Earth's atmosphere, however, opened new horizons.[4] On 27 September 2004, Mr. Richard Branson (Virgin Galactic) and Mr. Burt Rutan (Scaled Composites) announced plans to build the first commercial aerospace vehicle.[5] On October 4 of the same year, SpaceShipOne became the first private manned craft to exceed an altitude of 100 km twice within 14 days[6], which allowed Scaled Composites to claim (and win) the Ansari X-Prize.[7] This set the stage for Virgin Galactic to declare the development of the first commercial "spaceline company", aiming at "democratizing access to space for the benefit of life on earth".[8]

Indeed, the reasons behind this new industry development are the commercial interest in a variety of its applications. In the near term, other than for tourism purposes, it will be used for, among other

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[1] Clarence J Geiger, "History of the X-20A Dyna-Soar" (October 1963), *Historical Division Information Office Aeronautical Systems Division Air Force Systems Command, Defense Technical Information Center*, online: <www.dtic.mil/dtic/tr/fulltext/u2/a951933.pdf>.

[2] "Armstrong Fact Sheet: X-15 Hypersonic Research Program" (Feb. 28, 2014), *NASA,* online: <www.nasa.gov/centers/armstrong/news/FactSheets/FS-052-DFRC.html>.

[3] *Ibid*.

[4] Tim Sharp, "SpaceShipOne: The First Private Spacecraft: The Most Amazing Flying Machines Ever", *Space.com*, online: <www.space.com/16769-spaceshipone-first-private-spacecraft.html> [hereinafter Tim Sharp, "SpaceShipOne*"*].

[5] Craig Freudenrich, "History of Virgin Galactic", *How Stuff Works*, online: <science.howstuffworks.com/virgin-galactic1.htm>.

[6] On Sept. 29, 2004, Mike Melvill flew to an altitude of 64 miles (102 km) and, on Oct. 4, 2004, pilot Brian Binnie flew to an altitude of 70 miles (112 km). See Tim Sharp, "SpaceShipOne*", supra* note 4.

[7] "SpaceShipOne Flies Again Within 14 Days - Wins $10m X Prize"*, Scaled Composites*, online: <www.scaled.com/projects/tierone/spaceshipone_flies_again_within_14_days_-_wins_10m_x_prize>.

[8] "Human Space Flight", *Virgin Galactic*, online: <www.virgingalactic.com>; Virgin Galactic notes that up to date up to date, fewer than 600 people traveled to space, and poses itself as a new opportunity to broaden such access for various scientific and commercial purposes. See *ibid* at "Spaceline for Earth".

applications, small satellite launches, microgravity experiments, astronaut training, etc.[9] But the major point of interest of such flights is that they potentially constitute the inception of a new era where Point-to-Point (PTP) international suborbital operations could be a daily reality. Virgin Galactic has explicitly envisaged the opportunity of "providing a world-shrinking, transcontinental service".[10] Similarly, at the 2017 International Astronautical Congress in Adelaide, Australia, SpaceX's CEO Elon Musk announced the intention of creating international suborbital PTP operations with the aim of transporting paying passengers from one side of the Earth to the other in less than 30 minutes for most destinations and "anywhere on Earth in under an hour" for a fare not much different from that of a current long-haul airline ticket.[11]

As this thesis further analyses below, the foundations of international PTP transportation are being established by some countries. The development of aerospace operations poses many serious legal and practical questions that still remain unanswered. Operating in both airspace and outer space poses questions as to whether the vehicle employed shall be considered an aircraft, space object, or aerospace object, and which legal regime should apply. From a legal point of view, the lack of clarity on whether or which law applies is not acceptable, particularly considering the demands of industry and businesses for legal certainty.[12] Further, as these vehicles are users of the same air space that is shared with existing air traffic, the absence of a clear and uniform set of applicable rules poses great risks to the commercial civil aviation industry.

This thesis focuses on whether a new legal framework should be developed for suborbital operations and why. The thesis, further, explores which international forum or entity should be in charge of such a task and why it would be the most appropriate, especially considering the necessary flexibility any regime should have to adapt to future technological progress in this field. Specific consideration is given to the International Civil Aviation Organization (ICAO), which arguably is the ideal international organization responsible for managing such a regime. The thesis further highlights

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[9] National Research Council, Division on Engineering and Physical Sciences, Space Studies Board, Committee on NASA's Suborbital Research Capabilities, *Revitalizing NASA's Suborbital Program – Advancing Science, Driving Innovation, and Developing Workforc*e (Washington: National Academies of Sciences, 2010) Chapter 7 "Potential Opportunities for Commercial Suborbital Capabilities" at 60 and ss.

[10] "Spaceline for Earth", *Virgin Galactic*, *supra* note 8.

[11] Tory Shepherd and Jamie Seidel, "Elon Musk Unveils Lofty Vision at International Astronautical Congress in Adelaide to Pay His Way to Mars", *news.com.au* (29 September 2017), online: <https://www.news.com.au/national/south-australia/elon-musk-to-detail-his-mission-to-mars-at-international-astronautical-congress-in-adelaide-on-friday/news-story/53708c3d16e4070a66aab3d0b8b7477a> [*hereinafter* Shepherd & Seidel, "Elon Musk"].

[12] Ram S Jakhu, Tommaso Sgobba and Paul Stephen Dempsey, eds, *The Need for an Integrated Regulatory Regime for Aviation and Space*: *ICAO for Space?* (New York: Springer, 2011) at 59 [*hereinafter* Jakhu, Sgobba & Dempsey, *ICAO for Space?*].

whether amending the Chicago Convention is a necessary step to expanding ICAO's mandate in this area and why.

Chapter I
Contextualizing the Issue

1 Air law

The term "air law" is controversial and probably not the most appropriate to describe what it regulates. Some have asserted that this term could encompass other interactions with the air such as airwaves from broadcast communication.[13] This author, however, sides with Professor Milde, who maintained that, although the term *aeronautical law* would be more accurate, air law, as is commonly understood, is the "regulations of social relations in airspace that are related to or generated by the aeronautical use of that space".[14] Academia also disagrees on whether air law ought to be categorized as a separate branch of law. On the one hand, in fact, as Professors Havel and Sanchez underline, the high number of treaties, statutes, regulations, and jurisprudence uniquely applicable to aviation and the creation of the International Civil Aviation Organization (ICAO), a separate United Nations (UN) organ to develop common global aviation rules, tend to frame air law as a separate body of law.[15] On the other hand, it should be kept in mind that air law also encompasses rules from many different branches of law,[16] which constitute the fundamental basis of the aviation regulatory regime.[17] Air law is tied to aviation technology and, therefore, it has a relatively short history. Aviation, since its origins, has been regarded as inherently international[18] and, due to its rapid development, "custom has largely been bypassed as a source of law, the result being that air law today consists mainly of written [conventional international] law".[19]

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[13] Ronald IC Bartsch, *Aviation Law in Australia*, 4th ed (Rozelle: Thompson Reuters, 2013) at 22-25.
[14] Michael Milde, *International air law and ICAO* (The Hague: Eleven International Publisher, 2012) at 1.
[15] Brian F Havel and Gabriel S Sanchez, *The Principles and Practice of International Aviation Law* (Cambridge: Cambridge University Press, 2014) at 5.
[16] Michael Milde, *International air law and ICAO*, *supra* note 14 at 2.
[17] *Ibid*.
[18] Paul S Dempsey, *Public International Air Law*, 2nd ed (Montreal: Institute of Air and Space Law, McGill University, 2017) at 1.
[19] IHPh Diederiks-Verschoor, *An Introduction to Air Law*, 6th ed, (The Hague: Kluwer Law international, 1997) at 9-10 [*hereinafter* Diederiks-Verschoor, *An Introduction to Air Law*].

1.1 Historical development of aviation: contextualizing the birth of the principle of sovereignty over the airspace above each state's territory

The first free flight carrying human beings onboard was by Pilatre de Rozier and the Marquis d'Arlandes using a hot air balloon designed by the brothers Joseph and Etienne Montgolfier on 21 November 1783, in Paris.[20] Such vehicles' limited maneuverability generated concerns, especially when overflying a city such as Paris in 1783 where fire prevention was very limited.[21] Indeed, on 23 April 1784, Paris police issued a directive prohibiting the balloon's flight over the city if not pre-authorized by the authorities: the very first norm of air law.[22]

Modern aviation began with the Wright Brothers' 20-second 120-foot flight which took place in Kitty Hawk, North Carolina on 17 December 1903.[23] In 1909, the French citizen Luis Bleriot crossed the English Channel in a 37-minute flight;[24] this first international flight was an inspiring demonstration of aviation's commercial potentialities, but it also raised concerns among States for its potential military application. Security concerns, indeed, motivated what is defined as the first attempt of international codification of air law: the Paris Conference of 1910.[25] Three States' positions at the conference were emblematic of the States' different opinions on the extent of the restriction of freedom of flight each State could impose on the airspace above its territory. According to Professor Cooper:

> France and Germany were of the view that national restrictions in freedom of flight imposed by each State must have been applied equally to both national and foreign aircraft,[26] while the British ultimately suggested a compromise[27] offering to accept such position of equal treatment "except as to measures which a State takes to assure its security".[28]

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[20] Dempsey and Gesell, *Air Transportation: Foundations for the 21st Century*, 3rd ed (Chandler: Coast Aire Publications, 2010) at 43.
[21] Milde, *International air law and ICAO, supra* note 14 at 6.
[22] PH Sand, G Pratt and J T Lyon, *A Historical Survey of the Law of Flight*, (Montreal: Institute of Air and Space Law, McGill University, 1961) at 5.
[23] Dempsey*, Public International Air Law, supra* note 18 at 10.
[24] Milde, *International air law and ICAO, supra* note 14 at 6.
[25] Diederiks-Verschoor, *An Introduction to Air Law*, *supra* note 19 at 3. In 1908, due to continued incursion of German spy balloons into the French territory, the French Government called the other European governments to a diplomatic conference with the scope of regulating air navigation. See Gaston Bonnefoy, *Le Code de l'air*, (Paris : M. Rivière, 1909) at 186-190. The conference was held in Paris in 1910, and 18 States attended. See also E Pépin, "La conference de paris de 1910 ou le premier essai de réglementer l'aviation international" (1978) III Ann. Air & Sp L 185 at 190.
[26] John C Cooper, *Explorations in Aerospace Law* (Montreal: McGill University Press, 1968) at 119-120 [hereinafter Cooper, *Explorations in Aerospace Law*].
[27] The British, in fact, perceived an unsurmountable danger in such freedom and initially imposed a view that full sovereignty must have been assured without restriction of any kind. See Cooper, *ibid* at 119.
[28] *Ibid*.

The lack of agreement on this point led to the breakdown of the Paris Conference,[29] which, however, was an important forum to clarify that:

1) each State had full sovereignty over flight-space above their territory; and
2) no general right of innocent transit for aircraft of other States existed.[30]

This general understanding was subsequently put into practice in the few years following the conference, which was identified by Cooper as a key period in the development of fundamental principles of international air law.[31] In fact, Great Britain's 1911 Aerial Navigation Act,[32] France's presidential decrees of 21 November 1911 and of October 1913,[33] various German decrees and orders since 1910,[34] and the agreement between France and Germany in 1913,[35] were all based on the States' conception of their sovereignty over the airspace above their respective territories. Between 1912 and 1913, Austria-Hungary, Russia, the Netherlands and Serbia,[36] and by 1914, all European countries which regulated aerial navigation, based their laws and regulations on this sovereignty principle.[37] It is, therefore, safe to say that already between 1910 and 1914 the principle of sovereignty was *de facto* recognized among most aviation-faring States, and that extended as high as practicable for flights in that period.[38]

1.1.1 The Paris Convention of 1919

Both Professors Dempsey and Manley Hudson identify as commercial and military the reasons behind the creation of the Paris Convention of 1919. One the one hand, aviation had proven its capacity during

[29] *Ibid* at 126.
[30] *Ibid*.
[31] *Ibid* at 125-126.
[32] *Ibid* at 127.
[33] *Ibid* at 128-129.
[34] *Ibid* at 129-130.
[35] Małgorzata Polkovaska, "The Development of Air Law: From the Paris Conference of 1910 to the Chicago Convention of 1944" (2008) XXXIII Ann Air & Sp L 59 at 62 [hereinafter, Polkovaska, "The Development of Air Law"].
[36] Cooper, Explorations in Aerospace Law, supra note 26 at 132.
[37] *Ibid* at 133; see also George G. Bogert, "Problems in Aviation Law" (1921) 6 Cornell Law Quarterly 271 at 309. Those countries included also Switzerland, Sweden, Norway, Greece. See Polkovaska, "The Development of Air Law", *supra* note 35 at 63.
[38] Dempsey, *Public International Air Law, supra* note 18 at 17.

World War I; on the other, scheduled international services started to appear and many military pilots and aircraft were ready to be commercially applied.[39]

On 13 October 1919, 26 States[40] signed the Convention Relating to the Regulations of Aerial Navigation,[41] which was the first multilateral instrument of international law governing aerial navigation. The Convention codified some fundamental principles which still apply today. Among those, Article 1 provides:

> The High Contracting Parties recognize that every Power has the complete and exclusive sovereignty over the air space above its territory.[42]

The wording of the provision unequivocally recognizes (but does not create) the principle of sovereignty of every State, including those not party to the Convention. This further indicates States codified a principle already existing under customary international law.[43] The principle emphasizes the role of national governments and their political considerations[44] in the development of international aviation law.[45] The Convention, nevertheless, granted a "freedom of innocent passage"[46] on a non-discriminatory basis only to the Member States who were party to the Convention, purposely discriminating against the non-parties. The most innovative element of the Convention was the

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[39] *Ibid* at 21; See also Manley Hudson, "Aviation and International Law" (1930) 1 Air L Rev 183 at 186. See also Betsy Gidwitz, *The Politics of International Air Transport* (Lexington: Lexington Books, 1980) at 37.

[40] Belgium, Bolivia, Brazil, British Empire, China, Cuba, Czechoslovakia, Ecuador, France Greece, Guatemala, Haiti, Hedjaz (Saudi Arabia), Honduras, Italy, Japan, Liberia, Nicaragua, Panama, Peru, Poland, Portugal, Romania, Serbo-Croat-Slovene State, Siam and Uruguay. See Albert Roper, *La Convention Internationale du 13 Octobre 1919 portant Reglementation de Navigation Aérienne: Son Origine, son Application, son Avenir*, (Paris: Librairie du Recueil Sirey, 1930) at 87 and ss.

[41] *Convention Relating to the Regulation of Aerial Navigation*, 13 October 1919, 11 LNTS 173 [hereinafter "Paris Convention"].

[42] *Ibid,* art I.

[43] See *Statute of the International Court of Justice*, 26 June 1945, 892 UNTS 119 art 38 d [hereinafter ICJ Statute]: "evidence of a general practice accepted as a law". Both elements of *opinion juris ac necessitatis* and of *usus longevus* were observable by the states' practices of the last years prior the Convention. It must be noticed that there is no agreement on what constitutes *usus longevus*, however, in this case it is possible to refer to John Cobb Cooper's study to verify how, the period between 1910 and 1914 was a pure expression of both elements. See Cooper, *Explorations in Aerospace Law, supra* note 26. It must be kept in mind that, although the Paris Convention of 1919 and subsequently the Chicago Convention of 1944 recognize States' exclusive sovereignty in the airspace above their territory, such sovereignty is mitigated by the States' obligation to comply with the treaty. Further, at least since the Nuremburg Trials, limitations have been placed on sovereign suggesting how law has evolved "in a direction in which international limitations are increasingly, and with broader scope, imposed upon State sovereignty, while global governance becomes more ubiquitous". See Dempsey, *Public International Air Law*, *supra* note 18 at 19-21.

[44] Oliver Lissitzyn, *International Air Transport and Policy* (New York: Council on Foreign Relations, 1942) at vi.

[45] JW Salacuse, "The Little Prince and the Businessman: Conflicts and Tensions in Public International Law" (1980) 45 J Air L & Com 807 at 814.

[46] Paris Convention, *supra* note 41, art 2.

creation of the International Commission for Air Navigation (ICAN), a permanent commission under the direction of the League of Nations which had the duty to amend the Annexes of the Convention.[47] The Annexes had the same force as the Convention without necessitating a diplomatic conference.[48] This would have allowed an international and uniform development of air law concurrently, if not ahead of, technological progresses. However, due to the fact that the US was not part of the League of Nations, and that it would not have allowed any entity to introduce rules directly applicable to its territory without the Senate's previous approval, the US did not become party to the Convention.[49] Further, the framework of the Paris Convention also created dissatisfaction among many European States.[50]

1.2 The Warsaw Convention on air carrier liability

While the legal regime governing sovereignty over airspace was being solidified, commercial aviation rapidly developed, and soon issues of private international law relating to the liability of air carriers arose.[51] The Warsaw Convention of 1929[52] originated from the efforts of international aviation organizations that passed resolutions[53] to sensitize governments to build a uniform legal regime to shield carriers from aviation disaster awards that could have bankrupted the industry.[54] The French Government was the first to welcome the initiative and after submitting a bill to parliament in 1929 regulating air carrier liability, decided to raise the question internationally and convened the First International Conference of Air Law on 27 October 1925, which resulted in the adoption, at the Second

[47] *Ibid,* art 34.
[48] *Ibid,* art 39.
[49] Dempsey, *Public International Air Law, supra* note 18 at 23.
[50] Spain was on top of the dissatisfied States and concluded the Ibero-American Aviation Convention in 1926 (also known as Madrid Convention), which essentially mirrored the Paris Convention of 1919 with some modifications. Although it never came into force, the Convention's importance ought to be seen in the incorporation of its modification into the Paris Convention Protocol to which followed the joining of Spain and Argentina into the Paris Convention. See Małgorzata Polkovaska, "The Development of Air Law", *supra* note 35 at 71. According to Milde, the Madrid Convention was just a political stance of Spain following its dissatisfaction on its role within the League of Nations, in order to demonstrate its leadership on Latin America. See Milde, *International air law and ICAO*, *supra* note 14 at 12.
[51] Paul S Dempsey, *Aviation Liability Law* (Markham: LexisNexis, 2013) at 300.
[52] *Convention for the Unification of Certain Rules Relating to International Carriage by Air*, 152, 12 October 1929 Warsaw (13 February 1933). ICAO Doc 7838 [*hereinafter* Warsaw Convention].
[53] These following organizations, the League of Nations' Advisory and Technical Committee on Communications and Transit, the International Chamber of Commerce and the International Aeronautic Federation, respectively passed in 1922, 1923 and 1924, resolutions to call upon governments to set up a system of private international air law based on the same uniformity foundation of the 1919 Paris Agreement. See: John Jay Ide, "The History and Accomplishment of the International Technical Committee of Aerial Legal Experts (C.I.T.E.J.A.)" (1932) 3 J. Air L. 27 at 27.
[54] Dempsey, *Aviation Liability Law*, *supra* note 51 at 304.

Conference held in Warsaw in 1929, of the Convention for the Unification of Certain Rules Relating to International Transport by Air,[55] the most widely adopted international private law instrument in history.[56] The Convention's scope is the unification, among different national jurisdictions, of air carrier liability arising out of international carriage by air in the case of passenger injury, death, and baggage loss. Seven decades later, at Montreal, States came together to update the air carrier liability regime under the Montreal Convention of 1999.[57]

Like, the Warsaw Convention, the 1933 Rome Convention,[58] and its supplementary 1938 Brussels Protocol,[59] aimed at unifying the States parties' domestic liability regimes applicable to damage to third parties on the ground caused by international flights. The desire to ensure adequate compensation while reasonably limiting the extent of the carriers' liabilities motivated States to join the Rome convention of 1952.[60]

1.3 World War II

World War II proved to be an accelerator for the advancement of aviation technology. By the end of the War there were vast number of planes, capable of carrying heavy loads and crossing the oceans, ready to be transformed for civilian use. The Allies foresaw the need to invest in aviation, which was "the most effective and first available means of transportation in the word of disrupted railways and […] roads".[61]

US President Roosevelt called for an international conference to be held in Chicago on 7 November 1944 to "discuss the principles and methods to be followed in the adoption of a new aviation convention".[62] Of the 54 States invited, 52 attended: Saudi Arabia and the Union of Socialist Soviet

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[55] *Ibid* at 305-306.

[56] Michael Milde, "Warsaw System and Limits of Liability – Yet Another Crossroad?" (1993) XVIII: 1 Annals of Air & Space L. 201 at 202. See also: Stuart M Speiser & Charles L Krause, *Aviation Tort Law*, (Rochester, N.Y.: Lawyers Cooperative Pub. Co., 1979) at 634.

[57] *Convention for the Unification of Certain Rules for International Carriage by Air*, 136, 28 May 1999, Montreal (4 November 2003) ICAO Doc 9740 [*hereinafter* Montreal Convention of 1999].

[58] *International Convention for the Unification of Certain Rules Relating to Damage Caused by Aircraft to Third Parties on the Surface*, 29 May 1933, Rome, ICAO Doc 106-CD.

[59] *Protocol Supplementary to the International Convention for the Unification of Certain Rules Relating to Damage Caused by Aircraft to Third Parties on the Surface*, 29 September 1938, Brussels.

[60] *Convention on Damage Caused by Foreign Aircraft to Third Parties on The Surface*, 7 October 1952, Rome (entered into force 4 February 1958) [*hereinafter* Rome Convention 1952].

[61] Milde, *International air law and ICAO, supra* note 14 at 13-14.

[62] *Proceedings of the International Civil Aviation Conference*, *Chicago*, *1944* (Washington: US Department of State Printing Office, 1948) Vol. I at 11-13 [hereinafter *Proceedings*]. President Roosevelt, in his invitation to the Conference, identified the historical step the world was about to take: "write a new chapter in the fundamental law of the air", see

Republics (USSR) declined.[63] Professor Milde asserted that the Soviet refusal was an early sign of the "Cold War", which proved that the USSR was not receptive to opening its airspace to international cooperation.[64] The key role played by aviation drove States to adopt and sign the Convention on International Civil Aviation on 7 December 1944,[65] remarkably prior to the Conference of San Francisco in the Spring of 1945, which adopted the UN Charter.[66]

During the convention-drafting process, the positions of two States were emblematic of the geopolitical situation of the time. On one side, the US pushed for freedom of air transport and for the creation of an "International Aviation Assembly" limited to technical issues,[67] which would have led US carriers to dominate the world without facing any competition.[68] On the other side, the UK proposal aimed to establish an "International Air Authority" with the power to allocate routes, rates and frequencies.[69] This reflected the UK's wishes to protect its vast colonial airspace.[70] Ultimately, neither proposal prevailed. Indeed, the Convention failed to become an instrument of universal exchange of traffic rights or a comprehensive economic charter for international civil aviation.[71] Fares, rates, and tariff regulation were left to industry conferences and self-regulation subject to governmental approval.[72] Nevertheless, the Convention laid down the fundamental principles governing international air law with particular emphasis on the achievement of uniformity on technical aspects such as safety

Assad Kotaite, *My Memoirs: 50 Years of International Diplomacy and Conciliation in Aviation* (Montreal: ICAO, 2013) at 42.

[63] Indeed, although the Axis nations – Germany, Italy, and Japan – were not invited, the presence of Spain and Portugal which at the time were led by fascist government, constituted the official URSS refusal to attend the Conference. See Welch Pogue, "Airline Deregulation, Before and After: What Next?" (Lindbergh Memorial Lecture, Washington, D.C., May 23, 1991) at 14-15.

[64] Milde, *International air law and ICAO, supra* note 14 at 14.

[65] *Convention on International Civil Aviation*, 7 December 1944, 15 UNTS 295 (entered into force 4 April 1947), ICAO Doc 7300 [*hereinafter* Chicago Convention].

[66] Charter of the United Nations 26 June 1945, 892 UNTS 119 [hereinafter UN Charter].

[67] *Proceedings*, *supra* note 62, Vol. II at 554.

[68] Milde, *International air law and ICAO, supra* note 14 at 15.

[69] *Proceedings*, *supra* note 62 at 566.

[70] Milde, *International air law and ICAO, supra* note 14 at 15.

[71] On such point one should however note that though economic aspects were left to the bilateral relation among states, during the convention the Air Transport Agreement was drafted. It provided States the opportunity to multilaterally exchange traffic rights. See *International Air Transport Agreement*, 7 December 1944, (entered in force: 8 February 1945).

[72] Ludwig Weber, *International Civil Aviation Organization (ICAO),* 2nd ed (Alphen aan den Rijn, The Netherlands: Kluwer Law International, 2015) 15 at para 4 [hereinafter Weber, *ICAO*].

and navigation, in addition to establishing the International Civil Aviation Organization (ICAO) – now a UN specialized agency[73] – and containing its charter.[74]

ICAO has technical standard-setting responsibilities and general supervisory functions on the achievement of the Convention's objective.[75] Under Article 1, the Chicago Convention reaffirmed the principle of exclusive sovereignty of the Paris Convention, establishing that: "The Contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory".[76] "Exclusive sovereignty" denotes the exclusive jurisdiction of a concerned State to adopt and implement laws and regulations all to the exclusion of another State's jurisdiction.[77] The State's territory is defined in Article 2 as "the land areas and territorial waters adjacent thereto under the sovereignty, suzerainty, protection or mandate of such State".[78] Article 12 of the Chicago Convention establishes that "Over the high seas, the rules in force shall be those established under this Convention"[79], thereby excluding sovereignty of States over the airspace above the high seas. In contrast to Article 2 of the Paris Convention, under the Chicago Convention no freedom of innocent passage to aircraft of other contracting States is granted except "for aircraft not engaged in scheduled international air services".[80] Just like under the Paris Convention, the Chicago Convention addresses the nationality, registration, and certification of the aircraft.[81] Of relevance is Article 37 of the Chicago Convention, which provides that ICAO "shall adopt and amend […], as may be necessary, international standards and recommended practices [SARPs] and procedures".[82] Similarly to the ICAN's provisions annexed to the Paris Convention, ICAO's SARPs are annexed to the Chicago Convention.[83] Articles 37 and 38 lay down the quasi-binding juridical value of ICAO Annexes, a matter to which further attention will be dedicated below.

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[73] ICAO has the status of a specialized agency of the United Nations in the sense of Article 7 of the United Nations Charter, by virtue of 1) the *Agreement between the United Nations and the International Civil Aviation Organization*, 13 May 1947, UNTS Vol. 8, ICAO Doc. 7970 at 324 et seq.; and 2) the *Convention on the Privileges and Immunities of the Specialized Agencies,* 21 November 1947, UNTS at 242-261.
[74] Dempsey, *Public International Air Law, supra* note 18 at 37.
[75] See Ludwig Weber, "Chicago Convention," in *Encyclopedia of Public International Law,* (Amsterdam, North-Holland, 1992), vol. I at 571 et seq.
[76] Chicago Convention, *supra* note 65, art 1.
[77] Cooper, *Explorations in Aerospace Law, supra* note 26 at 125ss.
[78] Chicago Convention, *supra* note 65, art 2.
[79] *Ibid*, art 12.
[80] *Ibid*, art 5.
[81] *Ibid*, arts 17ss, arts 29ss.
[82] *Ibid*, art 37.
[83] *Ibid*, art 54 (l).

2 Space law treaties and the Cold War influence

In 1957, Sputnik I was the first satellite to enter outer space and orbit the Earth and, according to Professor Cheng, the event gave rise to an 'instant' customary norm of international law providing for the freedom of use of outer space, for two reasons:

> 1) The States' abstention from objecting to the use of outer space over their territory;
> 2) The States' expressions of *opinio juris* through their votes in the UN General Assembly resolutions successive to the event.[84]

Although the first reason is hardly possible due to the probable lack of knowledge of when and at which altitude the satellite crossed the atmosphere above the respective States' territories, the principles contained in the General Assembly's resolutions preceding the Outer Space Treaty clearly demonstrate the States' recognition of the freedom of use of outer space.

On 13 December 1958, the General Assembly approved the establishment of the UN Committee on the Peaceful Uses of Outer Space (COPUOS) as an Ad Hoc Committee,[85] successively established as a permanent body with resolution 1472 (XIV) of 12 December 1959[86] "to study and report on the legal problems which may arise from the exploration and use of outer space".[87] UNCOPUOS, due to the Soviet bloc's dissatisfaction with its composition and majority rule of proceeding,[88] was the first entity within the UN to adopt the use of consensus rule for its decisions.[89]

In 1961, the UN adopted Resolution 1721 (XVI),[90] behind the drafting of which stood an agreement between the US and the Soviet Union that, according to Cheng, "broke the deadlock between them regarding outer space co-operation in the United Nations".[91] The importance of this resolution can be

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[84] Bin Cheng, "United Nations Resolutions on Outer Space: "Instant" International Customary Law?" (1965) 5 Indian J Int'l L 23 at 36.
[85] Following proposals made by the United States in January and July 1957 and a Soviet counter-proposal put forward in March 1958; see Bin Cheng, *Studies in International Space Law,* (Oxford: Oxford University Press, 1997) at 125 [*hereinafter* Cheng, *Studies in International Space Law*].
[86] *International co-operation in the peaceful uses of outer space*, GA Res 1472 (XIV), UNGAOR, 14th Sess, (1959) at 1.
[87] *Ibid* at (b).
[88] Cheng, *Studies in International Space Law, supra* note 85 at 126.
[89] Eilene Galloway, "Consensus as a Basis for International Space Cooperation", (1978) 20 Proc. Colloq. Outer Space 105 at 105.
[90] *International co-operation in the peaceful uses of outer space*, GA Res 1721 (XVI), UNGAOR, 16th Sess, UN Doc A/4987 (1961) [*hereinafter* Res. 1721 (XVI)].
[91] Cheng, *Studies in International Space Law, supra* note 85 at 126.

seen in these two principles it incorporates:[92]

(a) International law, including the Charter of the United Nations, applies to outer space and celestial bodies;
(b) Outer space and celestial bodies are free for exploration and use by all States in conformity with international law and are not subject to national appropriation;[93]

Cheng observes that both the US and the Soviet Union treated this resolution as binding because of its unanimous adoption and also because the Soviet Union considered the resolution *declaratory of international customary law*.[94] Indeed, although UNGA resolutions are of a non-binding nature – even when unanimously adopted – [95] they may well explicate customary international law. Professor Cheng believes this could have been the case. Cheng further sustains that the States' attitude on these issues during the "longer period of gestation" of resolution 1962 (XVIII),[96] which incorporates the two principles contained in Resolution 1721 A (XVI), further provided grounds that these principles were, indeed, declaratory of customary international law.[97] The form in which those principles were to be set out was an object of disagreement between the US and the Soviet Union, the former tending for a General Assembly resolution and the latter for a treaty. The space race of the 1960s was characterized by high tension between the two superpowers who, only after the Moscow Test Ban Treaty,[98] agreed on "the form which the legal principles should take. They are first to be formulated as a declaration in a General Assembly resolution, and then in the future, as appropriate, to be translated into international agreements".[99]

[92] Principles part of the suggestions made by President Kennedy in his address before the General Assembly on 25 September 1961. See ILA, *Report of the 49th Conference, Hamburg* (1960) at 245.
[93] Res. 1721 (XVI), *supra* note 90.
[94] Cheng, Studies in International Space Law, *supra* note 85 at 127.
[95] UN Charter, *supra* note 43, art 18. According to Prof. Cheng, in fact, "legally and constitutionally, no special virtue attaches to a unanimous vote, even though politically it may be of significance". See Cheng, *Studies in International Space Law, supra* note 85 at 135-136.
[96] *Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space*, GA Res 1962 (XVIII), UNGAOR, 18th Sess, UN Doc A/5656 (1963).
[97] Cheng, *Studies in International Space Law, supra* note 85 at 127-128. See also Res. 1721 (XVI), *supra* note 90.
[98] *Treaty Banning Nuclear Weapon Tests in the Atmosphere, in Outer Space and Under Water,* 5 August 1963, 480 UNTS 43 (entered into force 10 October 1963) [*hereinafter* Moscow Test Ban Treaty].
[99] Indian Delegate to COPUOS, A/AC. 105/PV.24 (22.11.63) at 21; repeated in substance in Committee in, A/AC. 1/SR. 1343 (3.12.63) at 168. See also Cheng, *Studies in International Space Law*, *supra* note 85 at 132.

2.1 The Outer Space Treaty

The UNCOPUOS facilitated and contributed to the creation of the five space law treaties. The Outer Space Treaty (OST) codified existing principles of the previous UN General Assembly resolutions on the peaceful uses of outer space[100] and introduced new international space law principles.[101]

Article I of OST provides that "outer space […] shall be free for exploration and use by all States without discrimination of any kind"[102] and that the exploration and use "shall be carried out for the benefit […] of all countries [...] and shall be the province of all mankind".[103] Article II provides that outer space cannot to be subjected to national appropriation or to the sovereignty of any State.[104] Therefore, outer space is free for use by all States. Indeed, when a group of equatorial States attempted to claim sovereignty up to the geostationary orbit above their territories,[105] the claims were not recognized by the international community on grounds of contradiction with Articles I and II of OST.[106] Article III provides that State Parties shall carry on activities in the exploration and use of outer space in accordance with international law, including the Charter of the United Nations.[107] Concerning this article, Lyall and Larsen asserted that, "[p]ublic international space law is part of ordinary public international law and shares its sources".[108] Article VI imposes on State Parties international responsibility for national activities in outer space, including those of non-governmental entities.[109] The OST has also set fundamental principles upon which the other space law treaties are built. Indeed, Article V is further elaborated in the Rescue Agreement (RA)[110] while obligations under Article VII are elaborated in the Liability Convention (LC),[111] which provides for fault-based and

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[100] *Question of the peaceful use of outer space*, GA Res 1348 (XIII), UNGAOR, 13th Sess, (1958); Res 1472 (XIV), *supra* note 86; Res 1721 (XVI), *supra* note 90; *International co-operation in the peaceful uses of outer space*, GA Res 1802 (XVII), UNGAOR, 17th Sess, (1962); UNGA Res 1962 (XVIII), *supra* note 96.
[101] *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, 27 January 1967, 610 UNTS 205 (entered into force 10 October 1967) [*hereinafter* Outer Space Treaty].
[102] *Ibid*, art I.
[103] *Ibid.*
[104] *Ibid*, art II.
[105] "The Bogota Declaration" (1978) 6 J. Space L. 193 at para 1 [*hereinafter* Bogotá Declaration].
[106] Ram Jakhu, "The Legal Status of the Geostationary Orbit" (1982) VII Annals of Air and Space Law at 333.
[107] Outer Space Treaty, *supra* note 101, art III.
[108] Francis Lyall and Paul B Larsen, *Space Law: A Treatise* (Furnham, England: Ashgate Publishing Ltd., 2009) at 39 [*hereinafter* Lyall & Larsen, *Space Law: A Treatise*].
[109] Outer Space Treaty, *supra* note 101, art VI.
[110] *Ibid*, art V*; Agreement on the Rescue of Astronauts and the Return of Objects Launched in Outer Space*, 22 April 1968, 672 UNTS 119 (entered into force 3 December 1958) [*hereinafter* Rescue Agreement].
[111] Outer Space Treaty, *supra* note 101, art VII; *Convention on International Liability for Damage Caused by Space Objects*, 29 March 1972, 961 UNTS 187 (entered into force 1 September 1972) [*hereinafter* Liability Convention].

absolute liability of launching States. Article VIII has been further elaborated in the Registration Convention (RC).[112]

3 Aircraft and airspace, spacecraft and outer space, aerospace vehicle and… aerospace?

The legal implications of suborbital operations require a clear picture of how aircraft and spacecraft operate in their respective environments: airspace and outer space. The below paragraphs will, therefore, provide a quick overview of the basic characteristics of these vehicles and of the media they operate in that are legally relevant for the aim of such thesis.

3.1 Aircraft and airspace

The Chicago Convention's Annexes define aircraft as "any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface".[113] Aircraft, therefore, derive their motion capabilities from the surrounding air's properties.[114] In fact, the shape of aircraft wings takes advantage of differences in the pressure of the air flowing under and over the wing to create lift.[115] The thrust that moves the plane through the air may be generated by two types of propulsion systems: propeller[116] or jet.[117] Therefore, aircraft operate in that part of atmosphere where air is available at a quantity and density sufficient to allow thrust and lift: with an increase in altitude there is a corresponding decrease of air density and, consequently, of lift.[118]

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[112] Outer Space Treaty, *supra* note 101, art. VIII; *Convention on Registration of Objects Launched into Outer Space*, 14 January 1975, 1023 UNTS 15 (entered into force 15 September 1976) [*hereinafter* Registration Convention].
[113] *ICAO, Annex 2 to the Convention on International Civil Aviation, Rules of the Air*, 10th ed (July 2005) at definitions [*hereinafter* Annex 2]; *ICAO, Annex 7 to the Convention on International Civil Aviation,* Aircraft Nationality and Registration Marks, 6th ed (July 2012) at definitions [*hereinafter* Annex 7]; *ICAO, Annex 11 to the Convention on International Civil Aviation, Air Traffic Services*, 15th ed (July 2018) at definitions [*hereinafter* Annex 11].
[114] Marietta Benkö and Engelbert Plescher, *Reconsidering the Definition/Delimitation Question and the Passage of Spacecraft Through Foreign Airspace,* Essentials in Air and Space Law vol 12 *(The Hague: Eleven International Publishing, 2013)* at 7 [*hereinafter* Benkö & Plescher, *Reconsidering the Definition*].
[115] "How Wings Lift the Plane", *NASA* (12 June 2014) online: < https://www.grc.nasa.gov/www/k-12/UEET/StudentSite/dynamicsofflight.html >.
[116] Propeller is a spinning wing which produces lift in a forward direction. See "How Things Fly: Propellers" , *Smithsonian National Air and Space Museum,* online: < howthingsfly.si.edu/propulsion/propellers >.
[117] Jet-type engine contains blades which spin at high speed and compress the air in a mixture of fuel and an electric spark resulting in burning gases that expand and blast out through the engine's nozzle providing thrust forward. See "How Does a Jet Engine Work?" *NASA* (12 June 2014) online: < https://www.grc.nasa.gov/www/k-12/UEET/StudentSite/engines.html >.
[118] Benkö & Plescher, *Reconsidering the Definition, supra* note 114 at 7.

The atmosphere can be divided into five layers. The troposphere, the lowest and air-densest layer, extends to an altitude up to 15 km. The following layer is the stratosphere, which extends from the top of the troposphere to approximately 50 km. Subsequently, up to 85 km is the mesosphere, followed by the thermosphere at up to 600 km, and finally the exosphere, reaching an altitude up to 10,000 km.[119] Most commercial aircraft operate at an altitude of around 11 km[120], making the troposphere their operational environment.

3.2 Spacecraft and outer space

Contrary to aircraft, a spacecraft "does not rely on the air, neither for propulsion nor for its flight properties" [121], air density being an obstacle to overcome.[122] Rockets work better in a vacuum, which is characteristic of outer space, so the lower stratifications of the atmosphere present areas to be traversed as rapidly as possible. The escape of hot gasses through the rocket engine's nozzles provides the necessary lift to escape from the Earth's gravity and propulsion to travel into space.[123]
An orbit is a "regular, repeating [elliptic] path that one object in space takes around another one. An object in an orbit is called a satellite".[124] The time it takes a satellite to make one full orbit is called *period,* and the angle the orbital plane makes when compared with the Earth's equator is called *inclination*. The speed an object must travel to escape the planet's gravity and enter orbit is called escape velocity, which from the Earth is about 11.3 kilometers (7 miles) per second. The speed needed to stay in orbit is called *orbital velocity,* which, for example, at an altitude of 242 km above the Earth (150 miles), is about 17,000 miles per hour.[125] Therefore, *speed* and *altitude* are essential factors to keep an object in orbit. Earth's orbits can be divided into layers based on altitude and trajectory, and each orbit has a *perigee* and an *apogee* which are respectively referred as the closest and farthest point of the satellite to the body around which it is orbiting.[126]

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[119] "Earth's Atmospheric Layers", *NASA*, online: <https://www.nasa.gov/mission_pages/sunearth/science/atmosphere-layers2.html>.
[120] "Why Can't an Airplane Just Fly into Space? Why do we Need Rockets?" *NASA,* online: < https://spaceplace.nasa.gov/review/dr-marc-technology/rockets.html >.
[121] Benkö & Plescher, *Reconsidering the Definition*, *supra* note 114 at 8.
[122] *Idib*.
[123] Matthew A Bentley, *Spaceplanes: From Airport to Spaceport*, (Rock River, Wyoming: Springer, 2009) at 43-45. See also Benkö & Plescher, *Reconsidering the Definition, supra* note 114 at 124.
[124] "What is an Orbit?" *NASA,* (9 April 2009) online: < https://www.nasa.gov/audience/forstudents/5-8/features/orbit_feature_5-8.html >.
[125] *Ibid.*
[126] Lyall & Larsen, *Space Law: A Treatise, supra* note 108 at 245.

There are different classifications of Earth orbits; however, for this paper's purposes, the distinction provided by Professors Diederiks-Verschoor and Kopal is taken as reference. They identify four orbits around the Earth: Low Earth Orbit (LEO), between about 100-150 km above Earth; Highly Elliptical Earth Orbit (HEO) with a low-altitude perigee (under 1,000 km) and a high-altitude apogee (over 35,786 km); Medium Earth Orbit (MEO), between 2,000 and 35,000 km above Earth; and Geostationary Orbit (GSO) at 35,786 km above the equator.[127] The average velocity at LEO is approximately 10 km/second; at GSO it is around 2 km/second.[128]

The previous paragraphs show how there are opposing aspects between aircraft and spacecraft. Aircraft need the atmosphere for lift and to propel their motors, while spacecraft are impeded by the atmosphere and carry with them an oxidizer.

There is no legal definition of "space object"; rather, space law treaties provide that a space object include its component parts as well as its launch vehicle and parts thereof.[129] While, as seen below, such inclusion has the clear scope of ensuring that liability for damages caused by a launching vehicle, a space object, and their respective component parts falls onto the launching State(s), it does not help to identify what a space object is. Indeed, although orbital craft are space objects, not all space objects, as seen below, necessarily orbit.

3.3 Hybrid – aerospace – vehicles and suborbital trajectories

The emerging modes of commercial aerospace transportation, their characteristics, and the various scopes for which they are projected set the stage for questions about what the applicable law is and whether new laws should govern such activities.

A sub-orbital flight can be intended as "flight conducted at very high altitudes that can reach outer space but do not achieve the velocity necessary to reach and stay in an orbit around the Earth".[130] The flight therefore follows a sub-orbital trajectory which could be intended as the "intentional flight path of a launch vehicle, reentry vehicle, or any portion thereof, whose vacuum instantaneous impact point does not leave the surface of the Earth".[131] In the suborbital operations that are the subject of this thesis,

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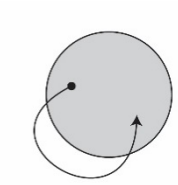
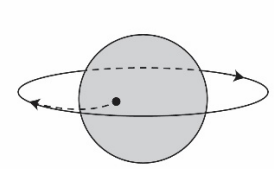
[127] I H Ph Diederiks-Verschoor and V Kopal, *An Introduction to Space Law,* (Alphen aan den Rijn: Kluwer Law International, 2008) at 20-21 [*hereinafter* Diederiks-Verschoor & Kopal, *An Introduction to Space* Law].
[128] Jakhu, Sgobba & Dempsey, *ICAO for Space?*, supra note 12 at 84.
[129] Liability Convention, *supra* note 111, art I (d).
[130] UNCOPUOS, Legal Subcommittee, *Matters Relating to the Definition and Delimitation of Outer Space: Replies of the International Institute of Space Law (IISL)*, 56th Sess, UN Doc. A/AC.105/C.2/2017/CRP.29, April 2017 at 2/4 [*hereinafter* IISL, Definition and Delimitation].
[131] 51 USC § 50902 (25).

the flight path of the vehicle launched from Earth passes 100 km above sea level but does not exceed 120 km[132], and then falls back to Earth forming a curve as in the image below:



On the contrary, to pursue an orbital flight path, a spacecraft enters a trajectory where, by maintaining a certain orbital speed, it could remain in space for at least one orbit.



Therefore, the difference between suborbital and orbital flight is given by the *trajectory* and not altitude.[133] Aerospace vehicles, even though they may reach orbital altitudes, do not keep the necessary speed which allows them to maintain an orbital trajectory.[134] However, as seen below, this does not mean that they are - or are not - space objects in the legal sense.

The term "suborbital flight" is not, perhaps, the most appropriate way to describe this type of activity because it evokes an activity that is lower than Low Earth Orbit, which is not always the case.[135] It would be more appropriate to identify it as "non-orbital space flight" or "non-orbital aerospace flight"; nevertheless, the debate remains open in the literature.[136] Considering that a concrete position on the matter has still not emerged, this thesis will use the terms sub-orbital or non-orbital interchangeably.

The last decade has been characterized by a growing interest in suborbital technology and operations, and many private companies are about to open new markets that may potentially revolutionize the way

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[132] Joseph N Pelton, "Regulatory Issues for New Global Aerospace Systems" (Presentation delivered at the 1st International Manfred Lachs Conference on Manfred Lachs Conference on the Regulation of Emerging Modes of Aerospace Transportation, McGill University, Institute of Air and Space Law, Montreal, May 2013) at slide 2 online: < https://www.mcgill.ca/iasl/events/mlc/mlc2013 > [*hereinafter* Pelton, Regulatory Issues].

[133] US Government Accountability Office, "Commercial Space Transportation: Development of the Commercial Space Launch Industry Presents Safety Oversight Challenges for FAA and Raises Issues Affecting Federal Roles" GAO-10-286T (2 December 2009) (Statement of Gerald L Dillingham, Director of Physical Infrastructure, before the Subcommittee on Aviation, Committee on Transportation, US House of Representatives) at 10, n 8 online: < http://www.gao.gov/assets/130/123783.pdf >.

[134] Derek Webber, "Point-to-point sub-orbital tourism: Some initial considerations" (2010) 66 Acta Astronautica 1645 at 1646 [*hereinafter* Webber, "Point-to-Point"].

[135] For example, sounding rockets may reach an altitude of 800miles above the mean sea level and returns following a "sub-orbital" or, better, "non-orbital" path. See What is a Sounding Rocket? *NASA*, online: <https://www.nasa.gov/missions/research/f_sounding.html>.

[136] IISL, "Definition and Delimitation" supra note 130 at 2/4.

we live and move.[137] Nevertheless, one of the fundamental questions that must be addressed is which law is applicable to such operations. From an international perspective, the uniform creation and applicability of rules governing such operations could be accomplished without conflicting with "traditional" aviation and space regimes. This thesis will explore the potential legal issues arising from the choice of applicable law and will focus on the need to proactively move towards an international approach of the issue from a legal perspective. Particular attention is given to the role ICAO could play in this regard and to the legal basis that justifies advocating for this intergovernmental body to assume leadership over suborbital operations.[138]

4 A proactive approach to the regulation of aerospace operations

The importance of the suborbital industry is clearly not related to tourism. Bringing six people at a time to 100 km of altitude for a price of $250,000 per passenger is probably not sustainable in the long term,[139] nor is it important for most human beings. Rather, the real contribution this industry could offer to the development of humanity is the subsequent creation of commercial suborbital-lines that would allow for the transportation of people and goods and thereby connect and shrink the world. Imagine traveling from Sydney to London within an hour.[140] This would revolutionize the way we perceive time and distance. This thesis particularly focuses on *international* suborbital point-to-point (PTP) operations, envisaged as possible future transportation means for people and goods.

The point of this study is to demonstrate the need for a legal regime which integrates aspects of air law and of space law (at least for suborbital PTP operations) under a single umbrella of global aerospace governance. Such a system should not only be governed by international public aerospace law but should integrate a private international aerospace regulatory regime that could be updated regularly by the depositary institution. The study is intended to sensitize the discussion at the governmental level about the immediate necessity to internationally and nationally review the current asset of space regulations, to forewarn the private space sector of the consequences if the current regime is

[137] To cite but some, Virgin Galactic, Blue Origin, Space X.

[138] On 27 November 2018, ICAO Secretary General, during a session of the Colloquium Series in Air and Space Law held at the Institute of Air and Space Law, advocated that "in light of ICAO's long-standing history and capability to set global standards and practices, … it is only logical that ICAO continues to assume a leadership role in regulating matters that may influence or have a bearing on the safety and security of global aviation". See "ICAO Secretary General Dr. Fang Liu visits the Institute of Air and Space Law", *McGill University Institute of Air and Space Law*, online: <www.mcgill.ca/iasl/#ICAO%20Secretary%20General>.

[139] For a list of foreseeable commercial uses of these vehicles see Federal Aviation Administration/Commercial Space Transportation, "The U.S. Commercial Suborbital Industry: A Space Renaissance in the Making*"* at 36 online: <https://www.faa.gov/about/office_org/headquarters_offices/ast/media/111460.pdf >.

[140] See, for example, Elon Musk, "Earth to Earth Transportation" (Presentation delivered at the International Astronautical Congress, Adelaide, 2017) online: <https://www.spacex.com/mars>.

maintained, and to contribute to the development of a global governance system that puts safety as a priority without hindering commercial investments and growth in the industry.
One of the most important roles of academia is to sensitize legislator(s) on which steps the current regulatory regime shall take, and what the dangers are of keeping a static position towards determinate subject-matters which seek to be regulated. The bulk of such a role is to develop critical thinking, which, especially in the realm of law, is a very powerful instrument – and, perhaps, among the most innovative – that may affect politics and public opinion on important issues. As Peter Hohendahl wrote about the Enlightenment:

> the concept of criticism cannot be separated from the institution of the public sphere. […] Critical reflection […] opens itself to debate, it attempts to convince, it invites contradiction.[141]

Functions ascribed to this critical study are to be perceived as an expression of society's needs and interests in the development of a strong commercial aerospace transportation sector, collected under the view of the possible benefits that could be derived from it.
As Eagleton notes,

> a critic may write with assurance as long as the critical institution itself is thought to be unproblematic. Once that institution is thrown into radical questions, then one would expect an individual act of criticism to become troubled and self-doubting.[142]

Though some may be critical of the value of scholarship in providing effective contributions to society,[143] I believe that the key role of this thesis, and that of academic studies in general, is to maintain the function of supporting the passage from *lex lata* to *lex de ferenda* for the collectivity's benefit. Humility, and the lack of time and space, nevertheless, impedes this study to present itself as a unique and comprehensive prospect of how commercial suborbital PTP human spaceflights must be regulated. Rather, the aim is to add a small chapter to the scientific literature, leaving itself open to questioning and criticism in the hope that it could stimulate further critical thinking on how to provide this industry with a solid chance of commercial development.

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[141] Terry Eagleton, citing Peter Hohendahl, in *The Function of Criticism: From Spectator to Post-Structuralism*, (London: Verso, 1984) at 10.
[142] *Ibid* at Preface.
[143] *Ibid.*

The portion of airspace used by commercial aircraft is the same that is used by suborbital vehicles during their launch and re-entry trajectory. If there is no common regulatory regime or an interaction of the regimes that applies to all users of the same portion of airspace, the risks to human life in the air, onboard, and on Earth are already evident. Historically, States have taken a reactive approach on matters to be regulated. Proper regulatory oversight often comes into existence after a catastrophe in after-the-fact attempts to avoid or reduce another tragedy or mishap from occurring again. This can be found in practically all branches of law. However, the question that often drives academia to critically analyze the need for regulation is whether it is necessary to wait for a catastrophe to happen before regulating a specific subject matter. This is one of the current challenges of the suborbital flight industry, and the primary rationale for undertaking this study.

The thesis will further utilize the proactive approach to seek the application of an evolutionary one. Although the Chicago Convention is among the most successful international legal instruments in history, this should not prevent initiatives geared to thinking forward and perhaps even proposals to modify the Convention, in the hopes of ensuring the continued safety and sustainability of all operations that traverse air space. Treaties, indeed, are not made to remain firm in time,[144] and all of them contain provisions to allow self-renovation in order to keep up with new and emerging needs that could not have been envisaged at the time of their drafting. Forward-looking conventions, such as the Chicago Convention, may need to be changed to maintain and expand their successful role in preserving and fostering the safe and orderly development of aerial and future aerospace navigation for the benefit of all.

[144] In the *Namibia* Advisory Opinion, the International Court of Justice held that "an international legal instrument has to be interpreted and applied within the framework of the entire legal system prevailing at the time of the interpretation." See *Legal Consequences for States of the Continued Presence of South Africa in Namibia (South West Africa) notwithstanding Security Council Resolution 276 (1970),* Advisory Opinion, [1971] ICJ Rep 16 at para 53 [hereinafter Namibia Adv Op]. See also Vienna Convention on the Law of Treaties, 23 May 1969, 1155 UNTS 331, Art. 31.1 [hereinafter VCLT].

Chapter II
The Delimitation Issue

The issue of definition and delimitation of outer space has been the subject of discussions and analysis within UNCOPUOS over the past decades. Nevertheless, no commonly agreed conclusion has been reached due to the different and often opposing positions of Member States.[145] Indeed, lack of political will has prevented the negotiation and agreement on a definition of outer space and on the establishment of boundaries at the international level.[146] The conflicting positions and interests of States are varied, but the most pressing seem to be strategic rather than economic.

If suborbital PTP operations are carried out partly in airspace and partly in outer space, it is not easy to legally establish whether they are space, aviation, or both activities. This produces uncertainty about which rules are applicable.[147] As seen below, various proposals have been advanced to address the issue of delimitation so as to establish which rules apply to any such operation and when.

Any rationale to determine a solution to the issue shall be founded on achieving the safety of aerospace activities. Indeed, the situation of uncertainty as to which legal regime applies creates a potential regulatory void in safety and navigation, which, in turn, increases the risk of disrupting civil aviation operations. Further, regulatory uncertainty undermines private sector investment in the development and commercialization of aerospace activities.[148]

1 Between airspace and outer space: "mesospace"?

Article 1 of the Chicago Convention provides that "every State has complete and exclusive sovereignty over the airspace above its territory".[149] Article I of OST provides that "outer space […] shall be free for exploration and use by all states"[150] and Article II of OST establishes that "outer space […] is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means".[151] However, neither the Chicago Convention nor any of the space law treaties define "air space" or "outer space", and "[n]o rule of conventional or customary international law defines

[145] The issue of delimitation is the oldest item on the COPUOS agenda, COPUOS' Legal Subcommittee is, indeed, dealing with it since 1967. See Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 53-54.
[146] IISL, "Definition and Delimitation", *supra* note 130 at 1/4.
[147] *Ibid* at 2/4.
[148] Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 62.
[149] Chicago Convention, *supra* note 65, art 1.
[150] Outer Space Treaty, *supra* note 101, art I.
[151] *Ibid*, art II.

where airspace ends and outer space begins".[152] Indeed, an international boundary has never been legally set, and there is no scientifically and widely accepted demarcation line between air space and outer space.[153] From a scientific-physical perspective, there is no a point at which airspace abruptly ends and outer space begins. Rather, as seen above, the atmosphere consists of five layers with decreasing densities of air the further a location is from the Earth's surface.[154] As mentioned before, commercial aviation takes place in the troposphere, the densest part of the atmosphere. However, the atmosphere extends up to 10,000 km above the Earth's surface. One should note, nevertheless, that the scope of legal airspace does not correspond to the geographical and physical boundaries of the atmosphere; indeed, what is legally considered outer space is already in the atmosphere, for example, certain satellites can orbit in the exosphere,[155] and the International Space Station orbits in the thermosphere.[156] As Dr. Jinyuan Su states:

> it could be inferred from the constant practice of states that the space where artificial satellites orbit belongs to outer space. In other words, outer space begins at least at the lowest perigee of artificial satellites.[157]

According to Professor Cheng:

> [There is a] general agreement which appears to exist among States that all existing satellites orbit in outer space, *i.e.,* space which, in their view, is not subject to national appropriation. From this consensus is drawn the essentially negative conclusion that States consider that airspace

[152] Jakhu, Sgobba & Dempsey, *ICAO for Space?*, *supra* note 12 at 57.
[153] Andrea J DiPaolo, " The Definition and Delimitation of Outer Space: The Present Need to Determine Where "Space Activities" Begin" (2014) 39 Annals Air & Space L. 623 at 624 [*hereinafter* Andrea J DiPaolo, " The Definition and Delimitation"].
[154] Troposphere, stratosphere, mesosphere, thermosphere, and exosphere. See NASA, "Earth's Atmospheric Layers", *supra* note 119.
[155] For example, see "What Is the Hubble Space Telescope?" *NASA,* online: <https://www.nasa.gov/audience/forstudents/5-8/features/nasa-knows/what-is-the-hubble-space-telecope-58.html>.
[156] Elizabeth Howell, "International Space Station: Facts, History & Tracking" (8 February 2018) *Space.com*, online: <https://www.space.com/16748-international-space-station.html>.
[157] Jinyuan Su, "The Delimitation Between Airspace and Outer Space and the Emergence of Aerospace Objects" (2013) 78 J. Air L & Com 355 at 360 [*hereinafter* Su, "The Delineation Between Airspace and Outer Space"]. See also Katherine M Gorove, "Delimitation of Outer Space and the Aerospace Object - Where Is the Law?" (2000) 28 J. SPACE L. 11 at 11-12 [*hereinafter* Katherine Gorove, "Delimitation of Outer Space"].

> sovereignty in no event extends as far as the lowest perigee of any satellite *so far placed in orbit.* This statement does not say that this consensus will *necessarily* extend to all future satellites.[158]

Indeed, in 1966, at the 52nd Conference of the International Law Association (ILA), Professor Goedhuis proposed the ILA accept the following resolution based on the lowest perigee of artificial satellites, which back then was about 80 miles (circa 128km) above mean sea level:[159]

> The International Law Association considers that the practice of States is consistent with the view that air sovereignty does not extend as far as the lowest perigee of any satellite so far placed in orbit.[160]

One should note that this statement "does not purport to fix definitively a precise boundary between outer space and national space […] [nor does it] define the existing upper limit of airspace sovereignty".[161] It rather confirms factual States' attitudes which recognize that the upper airspace limit "definitely does not lie outside the point indicated in the draft Resolution. […] [It] maybe lower, but not higher".[162] Although such resolution has not been adopted, the ILA, at its 53rd Conference, concluded "that the term "outer space" as used in the Treaty […] should be interpreted so as to include all space at and above the lowest perigee achieved by the 27th January 1967, when the Treaty was opened for signature, by any satellite put into orbit, without prejudice to the question whether it may or may not later be determined to include any part of space *below* such perigee."[163]

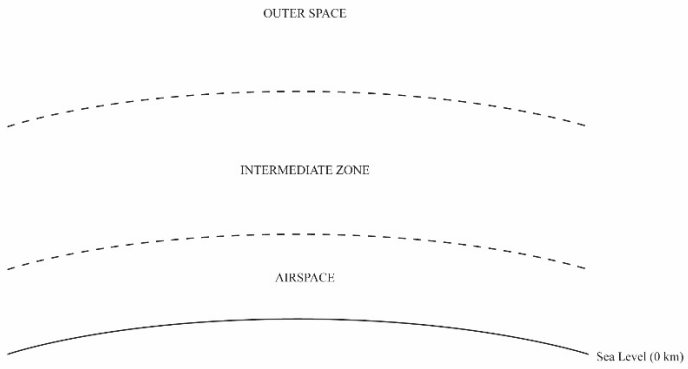
Professor Bin Cheng, nevertheless, already at the ILA's 52nd Conference went further, stating that:

> First, there is that layer of a State's super incumbent space closest to the surface of the earth which is incontrovertibly subject to national sovereignty. There is, secondly, beyond the point stated in the draft Resolution, the vast space which is equally incontrovertibly not subject to

[158] International Law Association, Report of the 52nd Conference, Air and Space Law (Joint Session), held at Helsinki (1966) 160 at 166 [*hereinafter* ILA, Rep 52nd Conf].
[159] *Ibid* at 167.
[160] *Ibid* at 161. According to Professor Goedhuis, "[b]y accepting this draft our Association would make a valuable contribution to the solving of the problem of the delimitation of air sovereignty." See *Ibid* at 160.
[161] *Ibid* at 167.
[162] *Ibid*.
[163] International Law Association, Resolutions of the 53rd Conference, held at Buenos Aires (1968) xi at xxii [emphasis added].

national sovereignty or appropriation. But [...] there is, *thirdly*, an intermediate zone of uncertainty lying below the point stated in the draft Resolution and above the undisputed zone of national airspace, in which, at a height that is not yet clearly defined, lies the actual boundary line between national space and outer space.[164]

(For an illustration of such concept, see figure below)



Today, it is this "intermediate zone" which provides uncertainty as to whether it legally constitutes airspace, outer space, or something different such as "near space", which ranges from 21 to at least 96 km. Indeed, it is certain that the portion of atmosphere up to an altitude of at least 21 km is customarily recognized by every State as being airspace. Based on limited, *de facto* behavior of States, what is less certain but very probable, is that at an altitude of around 100-110 km or even as low as 96 km, is where outer space begins.[165] According to Katherine Gorove:

> What appears to have emerged as international customary law is that the lowest perigee orbit of artificial earth satellites (currently, that would be approximately 100-110 km above sea level) lies at a point in outer space.[166]

[164] ILA, Rep 52nd Conf, *supra* note 158 at 167.
[165] Katherine Gorove, *"*Delimitation of Outer Space", *supra* note 157 at 11-12. See also Su, "The Delimitation Between Airspace and Outer Space", *supra* note 157 at 359–360. One should further consider the *Bogotà declaration,* which was broadly ignored, see Bogotá Declaration, *supra* note 105. See also John C Cooper, "High Altitude Flight and National Sovereignty" (1951) 4 International Law Quarterly 411 at 414.
[166] Katherine Gorove, *"*Delimitation of Outer Space", *supra* note 157 at 11-12.

Nevertheless, more and clearer expressions of *opinio juris* on this matter are needed to firmly crystallize whether an altitude of around 100 km is outer space.

Aerospace suborbital PTP transportation will operate primarily in airspace and in this "intermediate zone" during its ascendant and descendent phases, and will reach, during the upper ballistic portion of its operation, an altitude of around 120 km.[167] The question which therefore arises regarding such operations is whether they shall be subject to air law, space law, or both, and what the potential consequences are, especially if both regimes overlap. Further, especially when they operate in such an "intermediate zone", which law should apply?

The Chicago Convention, at the moment, applies to those machines that answer to an aerodynamic functionality *i.e.* "any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the earth's surface".[168] Like the international regime governing aviation, international space law does not provide a definition of its area of application, and the definition of "space object" is so wide that it is insignificant to identify a specific vehicle due to its characteristics.[169] There is no definition of an aerospace object although an attempted definition is that of "an object which is capable both of travelling through outer space and of using its aerodynamic properties to remain in airspace for a certain period of time".[170]

1.1 Delimitation is needed now

In 1972, Judge Manfred Lachs asked the following questions:

> (1) Where are the frontiers of outer space?[171]

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[167] Pelton, "Regulatory Issues", *supra* note 132 at slide 2.
[168] ICAO, Annex 7, *supra* note 113 at 1.
[169] "The term "space object" includes component parts of a space object as well as its launch vehicle and parts thereof", see Liability Convention, *supra* note 111, art I(d). Regarding the (inadequate) definition of space object, Cheng concludes that "[o]ne wonders… whether there are objects launched into outer space that are not 'space objects', and whether the two expressions 'space objects' and 'objects launched into outer space' are in fact conterminous." See Cheng, *Studies in International Space Law, supra* note 85 at 493.
[170] UNCOPUOS, Legal Subcommittee, *Questionnaire on Possible Legal Issues with Regard to Aerospace Objects: Replies from Member States*, UN Doc A/AC.105/635 February 1996 at 3 [*hereinafter* UNCOPUOS, *Questionnaire on Issues Referring to Aerospace Objects* 1996].
[171] Manfred Lachs, *The Law of Outer Space: An Experience in Contemporary Lawmaking* (Leiden: Martinus Nijhoff, 2010) at 53 [*hereinafter* Lachs, *The Law of Outer Space*].

> (2) Given that said frontiers are not yet established, is there any real dilemma in their absence?[172]

Indeed, before even investigating how to address the delimitation issue, one should look at whether "delimitation [is] necessary, or even desirable, at this time".[173]

The issue of delimitation between airspace and outer space has been on the agenda of the UNCOPUOS' Legal Subcommittee since 1967. Since then, no significant progress has been made in this regard. Indeed, UNCOPUOS' decision-making mechanism is based on the consensus rule which, however, has never been reached by States on this topic.[174]

In the optic of a *reactive* approach to law, the issue of delimitation has never hindered the development of "traditional" air or space activities since they were conducted in areas universally recognized and accepted as airspace and outer space respectively. Indeed, a reactive approach – at least of certain countries such as the US[175] – seem to have contributed to the deadlocking of the discussion at UNCOPUOS about the delimitation issue. As Hosenball and Hofgard noted back in 1986:

> The development of an aerospace plane may enhance the argument for a boundary line, but until the need for such a boundary is clearly illustrated by the operation of the vehicle, it is premature to impose one.[176]

Today, new commercial aerospace developments, which have produced machines capable of seamless operations in airspace and outer space and which possess both characteristics of airplanes and of rockets, have clearly brought an *urgent* need for clarification of which regime is applicable to them. A substantive part of suborbital PTP operations would be conducted in the "intermediate area" mentioned above.[177] This has brought confusion not only on whether air law, space law, or both should apply, but also on the eventual existence of overflight rights.[178]

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[172] *Ibid* at 53-54.
[173] S Neil Hosenball and Jefferson S Hofgard, "Delimitation of Air Space and Outer Space: Is a Boundary Needed Now" (1986) 57 U Colo L Rev 885 at 885 [*hereinafter* Hosenball & Hofgard, "Delimitation"].
[174] Jakhu Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 53-54; For a broader view see Working Group on the Definition and Delimitation of Outer Space of the Legal Subcommittee, *UNOOSA*, online: <http://www.unoosa.org/oosa/en/ourwork/copuos/lsc/ddos/index.html>.
[175] "Our position continues to be that defining or delimiting outer space is not necessary." See Agenda Item 6 Definition And Delimitation Of Outer Space And The Character And Utilization Of The Geostationary Orbit Statement By The Delegation Of The United States Of America, *US Department of State*, online <https://www.state.gov/s/l/22718.htm>.
[176] Hosenball & Hofgard, "Delimitation", *supra* note 173 at 892-893.
[177] Michael J Strauss, "Boundaries in the Sky and a Theory of Three-Dimensional States" (2013) 28:3 J Borderlands Stud 369 at 371.
[178] For further reading about near space see Wen-Qin Wang, *Near-Space Remote Sensing: Potential and Challenges (*Heidelberg: Springer, 2011).

2 A right of innocent passage?

Before introducing the various approaches to a potential legal solution of the delimitation issue, one should look at whether a right of innocent passage through sovereign airspaces in order to reach outer space and to return to Earth exists. Indeed, the eventual existence of any such right would clearly influence the determination of which law would apply. Such exploration should take into consideration two opposite yet equally recognized interests: on one side the absolute and exclusive sovereignty of each state on the airspace above its territories,[179] and, on the other, the freedom of exploration and use of outer space which may imply the necessity to pass through foreign airspaces in order to reach outer space.[180] Further, one should look at whether a right of passage exists in the "intermediate area" above other States' territories. Indeed, as Dr. Su notes, an aerospace object that is re-entering and moving toward its runway may be as far as 7000 km away when it is at an altitude of 96 km, and 12 km distant when it is at an altitude of about 21 km.[181] An absence of the right of passage and the uncertain status of this area may lead States to prohibit others from operating not only within their – widely accepted – airspace but, potentially, also in this 21-96 km "grey area" by, for example, claiming intrusion of their airspace – indirectly claiming sovereignty[182] – and therefore extending air law rules.

2.1 Through national airspace

Judge Manfred Lachs, who believed that some unwritten rule of law concerning transit through airspace to reach outer space has come into being,[183] contended that the "right of innocent passage should in principle be attributed to all States without discrimination"[184] . On the issue Dr. Su states that:

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[179] Chicago Convention, *supra* note 65, art 1.
[180] Under art I of the OST, all States have an equal right to freely access, use and explore outer space. Under article II, confining areas of space by means of sovereignty is not possible. See Outer Space Treaty, supra note 98, arts I, II.
[181] Su, "The Delimitation Between Airspace and Outer Space", *supra* note 157 at 374. See also UNCOPUOS, *Questionnaire on Issues Referring to Aerospace Objects* 1996, *supra* note 170 at 5.
[182] Su, "The Delimitation Between Airspace and Outer Space", *supra* note 157 at 375. Indeed, one should note that the area above any upper airspace boundary could be utilized by States for various civil and military purposes that could threaten the national security of a State. Therefore, States would be reluctant to accept that their sovereignty ends at a relatively low altitude, such as 21km.
[183] Lachs, *The Law of Outer Space, supra* note 171 at 60.
[184] *Ibid* at 57.

> Reconciliation of the right of passage with the principle of sovereignty is not impossible, as demonstrated by the right of innocent passage through territorial waters.[185]

Similarly, Professor Stephen Gorove said that:

> the freedom of exploration and use of outer space ... implies the freedom to go into outer space and also the freedom to return to earth from outer space.[186]

One should, however, note that in the *Benin/Niger* case the ICJ noted that:

> a boundary represents the line of separation between areas of State sovereignty, not only on the earth's surface but also in the subsoil and in the suprajacent column of air.[187]

With regards to aircraft, in *Nicaragua v. United States*, the ICJ asserted that:

> [t]he principle of respect for territorial sovereignty is also directly infringed by the unauthorized overflight of a State's territory by aircraft belonging to or under the control of the government of another State.[188]

Further, in ICAO's view, should suborbital vehicles be identified as a space objects, no innocent passage is allowed to them on the basis of the Chicago Convention. With this regard, ICAO, in a Draft Brief of 1986 for the ICAO Observer to the Legal Subcommittee of UNCOPUOS clarified that:

> The right of innocent passage of spacecraft through the sovereign airspace is a proposal de lege ferenda (i.e. a legislative proposal not reflecting the existing law); such right does not exist under the present international law of the air; an unconditional right of passage through the sovereign

[185] Su, "The Delimitation Between Airspace and Outer Space", *supra* note 157 at 375.
[186] Stephen Gorove, "Legal and Policy Issues of the Aerospace Plane", 16 J. SPACE L. (1988) 147 at 150.
[187] *Frontier Dispute (Benin v Niger)*, [1995] ICJ Rep 90 at para 124.
[188] *Military and Paramilitary Activities in and against Nicaragua (Nicaragua v United States of America)*, [1986] ICJ Rep 14 at para 251.

airspace does not exist even with respect to civil aircraft and is specifically subject to a special authorization with respect to State aircraft and pilotless aircraft.[189]

The above perspective is still held by ICAO. Therefore, under this interpretation, passage of a suborbital vehicle through sovereign airspace requires authorization of the State concerned.[190]
In support of such statements one should note that the majority of space object launches have happened either through the airspace of the launching state or over the airspace above the high seas over which states cannot exercise their sovereignty.[191] Those rare cases where a space object has crossed the airspace of another country has happened either with permission of the subjacent State or without its knowledge[192] of such passage to which an eventual opposition could have followed.[193] Indeed, the predominant attitude of states is to not recognize such freedom.[194]

Considering the above, one shall conclude that a right of innocent passage through sovereign airspace does not exist, even to reach outer space.

2.2 Through the intermediate zone between national airspace and outer space

There is still not much State practice with regard to the existence of any right of innocent passage in the "gray area" between 21-96 or 110 km above national airspaces. In this sense it is worth noticing that in 1960, a United States U-2 spy aircraft flying around 21km over the Soviet Union was shot down by the latter. The fight was operating so high compared to a normal aircraft that all the Soviet attempts to intercept it with fighter aircraft failed. Ultimately it was shot down with a ground-to-air missile.[195]

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[189] ICAO, *Draft Brief for the ICAO Observer to the Legal Subcommittee of the UN Committee on the Peaceful Uses of Outer Space*, ICAO Doc. C-WP/8158, 15 January 1986.
[190] *Ibid*.
[191] Chicago Convention, *supra* note 65, art 12.
[192] As the Republic of Korea pointed out in its reply to the COPUOS questionnaire on the issue, "[t]he fact that most of the countries did not raise any objection to the passage of space objects over their airspace does not signify their approval of the passage as international practice or precedents; they just did not have any information about the passage and there was no special perceptible disadvantage with the passage at that time." See UNCOPUOS, Legal Subcommittee, *Questionnaire on Possible Legal Issues with Regard to Aerospace Objects: Replies from Member States*, UN Doc A/AC.105/635/Add.1 March 1996 at 6.
[193] Katherine Gorove, "Delimitation of Outer Space", *supra* note 157 at 13-14. See also Jakhu, Sgobba & Dempsey, *ICAO for Space? supra* note 12 at 56.
[194] For a broad overview see Compilation of Replies Received from Member States to the Questionnaire on Possible Legal Issues with regard to Aerospace Objects; *UNOOSA*, online <http://www.unoosa.org/oosa/en/ourwork/copuos/lsc/2018/index.html>.
[195] Raymond L Garthoff, *A Journey Through the Cold War: A Memoir of Containment and Coexistence* (Washington, D.C.: Brookings Institution Press, 2001) at 86 n 6.

The US, nevertheless, neither justified nor protested the shooting at the subsequent trial of the pilot who was caught alive by the Soviets.[196]

It is therefore important to note that any future development of air, space, or aerospace law with regard to aerospace operations should take into consideration the regulation of any right of innocent passage. Potential sovereignty claims may seriously affect the development of the law in this "intermediate area". Perhaps the idea of granting such right in this area must be positively considered. One should note that the UN Convention on the Law of the Sea (UNCLOS)[197] is an example of a single regime that disciplines subsequent areas subject to different legal rules. Under the UNCLOS, like the air space above a state's territory, the *territorial waters* are subject to the territorial state's sovereignty[198] (although a right of innocent passage is provided for[199]). Over the *contiguous zones*[200] and *exclusive economic zones*[201], which could be compared to, and serve as a model for, the "gray area" discussed above, States enjoy limited sovereignty. Like outer space, the *high seas* are free for use by all[202]. The UNCLOS could, therefore, inspire the extension of the Chicago Convention's scope.

3 Proposed approaches to the issue of delimitation between airspace and outer space

The two regimes of air and space law are profoundly different and, as this thesis will further demonstrate, in case both apply, inconsistency and conflicting rules would provide confusion and uncertainty.

To answer the question to which extent each legal regime applies, many theories have been advanced,[203] all of which fall under two broad categories:

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[196] On the so called 'Powers Incident', see Quincy Wright, *Legal Aspects of the U-2 Incident*, 54 A.J.I.L. (1960) at 836.
[197] *United Nations Convention on the Law of the Sea*, 10 December 1982, 21 ILM 1261 (entered into force on 16 November 1994) [*hereinafter* UNCLOS].
[198] *Ibid* art 2, art 3.
[199] *Ibid* art 17.
[200] *Ibid* 33.
[201] *Ibid* art 56, art 58.
[202] *Ibid* art 87, art 89. See UNCOPUOS, Legal Subcommittee, 57th Sess, Item 7(a) of the provisional agenda, Paul S Dempsey and Maria Manoli, *A Submission by the Space Safety Law & Regulation Committee of the International Association for the Advancement of Space Safety*, UN Doc A/AC.105/C.2/2018/CRP.9 at 42-43.
[203] Among those, it is worth to note the following theories and their respective critiques:
The aerodynamic lift theory: An aircraft is that machine which depends on the reaction on the air as its mean of flying. Therefore, according to this theory, airspace ends at that altitude where aircraft are not able to find sufficient aerodynamic lift to sustain a flight. Among legal scholars supporting such theory are Cooper, Hogan and Potter. The main problem of this theory is that it essentially relies on technology, any evolvement of which would put in crisis the delimitation issue. See Gbenga Oduntan, *Sovereignty and Jurisdiction in the Airspace and Outer Space: Legal Criteria for Spatial Delimitation*, (London and New York: Routledge, 2012) at 297-300 [hereinafter Oduntan, *Sovereignty*].

1) The *functionalist* approach which looks at the *type* of vehicle;
2) The *spatialist* approach which looks at *where* the object is located.[204]

3.1 Functionalist approach

Under this approach, the determination of the object is fundamental to establishing the legal regime applicable. Many hypotheses have been advanced to answer this question, all of which essentially look either at the *characteristics* of the vehicle or at its *purpose*.[205] In the first case, an aerospace object would have the characteristics of both an aircraft and of a space object as traditionally intended. Following this, both regimes ought to apply. Nevertheless, if the vehicle's primary purpose determines its nature, one may conclude if the objective of the suborbital PTP operations is to transport humans and freight from one point to another on the Earth, and in doing so they will "pass through the air space over the territory of more than one State"[206] , they may therefore be identified as an "international air service" under article 96(b) of the Chicago Convention. In this latter case, if the *purpose* of the vehicle prevails, air law would apply even when the suborbital vehicle travels through outer space. ICAO has indeed endorsed such approach:

The Bogotà Declaration: In 1976, eight equatorial States (Brazil, Colombia, Congo, Equator, Indonesia, Kenia, Uganda and Zaire) claimed through a declaration that their sovereignty would extend up to the geostationary orbit (GEO), i.e. up to 36.000km above the earth's surface. The main argument in support of the declaration was the fact that an object orbiting at that altitude above the equatorial states travels at the same speed as the Earth, appearing, therefore, stationary. Indeed, paragraph 3 d) of the Declaration required that for permanently placed devices on that portion of the geostationary orbit above an equatorial state, the previous and expressed authorization of this latter was required. Further, according to the article, the device should conform to the law of such state. The declaration was rejected by the international community as clearly stands against Article I and II of the Outer Space Treaty. See *ibid* at 304. See also Bogotá Declaration, supra note 105 at paras 1, 3 d).
The national security and effective control theory: This theory is based on the extension of a state sovereignty over the space above its territory as far out as it is capable to exercise control effectively. This view is very dangerous because it creates inequality among states. Further, it does not create certainty as the technological advancement will allow to control increasingly high altitudes. Lastly, should a state determine to control up to what it is considered Outer Space, it would dangerously challenge Article I and II OST. See Oduntan, *Sovereignty, supra* note 203 at 306.
The Lowest Point of Orbital Flight Theory: This theory relies on the "lowest perigee of an artificial satellite orbiting the Earth" as a demarcation line between air and space. Nevertheless, as of today, at such an altitude, which is recognized at around 96km, the exact perigee cannot be determine "because of the atmosphere vagaries". See *Ibid* at 308.
[204] Peter van Fenema, "Suborbital Flights and ICAO" (2005) XXX/6 Air & Space Law 396 at 397. One should further note that although the Chicago Convention and the Outer Space Treaty have elements of both approaches, as seen above, none of them provides the respective definitions of *airspace* and *aircraft*, and of *outer space* and *space object*.
[205] See for exemple the aerodynamic lift theory, *infra* note 203.
[206] Chicago Convention, *supra* note 65, art 96(b).

> it might be argued from a functionalist viewpoint that air law would prevail since airspace would be the main centre of activities for suborbital vehicles in the course of an earth-to-earth transportation, any crossing of outer space being brief and only incidental to the flight.[207]

This approach, however, presents some shortcomings. Indeed, the lack of clear delimitation of airspace and outer space and the lack of a comprehensive definition of space object and of aerospace vehicle leave the purpose of the craft blurred for certain types of missions. For example, the Blue Origin New Shepard may be used for PTP international transportation but also for high altitude scientific or "space-tourism" purposes. Indeed, unless an international definition of aerospace transportation for international PTP operation is established, this approach would require an *ad hoc* analysis to exactly determine the nature or purpose of each vehicle, and this may seriously slow down if not hinder the determination of which law is applicable. Further, any parameter utilized to conduct the above determinations, if is not uniformly and internationally established, could lead to different interpretations for the same type of operation which may result in the application of different regimes (air or space law) to suborbital operations. Indeed, while the distinction between aviation and space activities was easy to make in the early days of space operations, today, with the current stage of the law, it would be hard to objectively reach a conclusion for every case without incurring doubts and lengthy legal analysis.[208]

3.2 Spatialist approach

One of the main problems of the *spatialist* approach has already been identified by Professor Cheng, who observed that:

> there are probably as many criteria as there are speakers and writers on the subject: gravitational effect, effective control, actual lowest perigee of orbiting satellites, theoretical lowest perigee of orbiting satellites, the von Karman line, limit of air drag, limit of air flight, the atmosphere and its various layers, an absolutely arbitrary height […] (100 kilometers) or one-hundredth of the earth's radius (64 kilometers […]), and so forth.[209]

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[207] ICAO, *Concept of Sub-orbital Flights*, (2005) Council 175th Sess, ICAO Doc C-WP/12436 at 5 para 6.2 [hereinafter ICAO, *Concept of Sub-orbital Flights*].
[208] Hosenball & Hofgard, "Delimitation", *supra* note 173 at 887-888.
[209] Bin Cheng, "The Legal Regime of Airspace and Outer Space: The Boundary Problem", V Annals of Air and Space Law (1980) 323 at 324-325.

Indeed, establishing where to draw a line between airspace and outer space will imply the agreement of States on a demarcation that would – essentially – be arbitrary. This is not easy as States have different interests and capabilities of using the medium above their territories, which would potentially produce different conclusions on how to establish such a line. Therefore, an arbitrary demarcation line should be determined based on a common necessity of *all* States.

At the national level, various States have adopted the spatialist approach and consider outer space as the area above an altitude of 100 km. Among those are Australia[210], Kazakhstan[211], and Denmark.[212] The majority of states, however, do not delimit outer space. Other states such as Belgium recognize a space object as only that which is launched (or attempted to be) "on an orbital trajectory around the Earth or to a destination beyond the earth orbit".[213] Under the former legislations space law would be applicable to an aerospace vehicle, while under the latter it would not.

Another issue with the spatialist approach is that, should something which requires legal determination happen close the demarcation line between the two mediums, it would be difficult to determine which regime is applicable.[214]

Further, since suborbital PTP transportation involves the utilization of both mediums, the application of two different regimes, even if at different stages of the flight, will lead to a double regime of certification/licensing, different types of liability exposure, etc. Any such situation would dramatically impact the industry with too burdensome requirements.[215]

3.3 A need for both?

Each approach, whether functional or spatialist, although it could facilitate the applicability of the law, is – per se – insufficient to address the need of a comprehensive and uniform international regulatory regime of suborbital operations and near space activities.

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[210] Government of Australia, Federal Register of Legislation, Space Activities Act 1998, No. 123, 1998, Part. 2, at 8, space object. *See*: < https://www.legislation.gov.au/Details/C2016C01070 >.

[211] Law of the Republic of Kazakhstan on Space Activities, 6 January 2012, No. 528-4, Chapter 1, article 1 at 6. Online: < http://bayterek.kz/en/info/zakon%20o%20kosmose.php >.

[212] Government of Denmark, Ministry of Higher Education and Science, Outer Space Act., cf. Act no. 409 (11 May 2016), Part 2, 4 at 4. Online*:* < https://ufm.dk/en/legislation/prevailing-laws-and-regulations/outer-space/outer-space-act.pdf >.

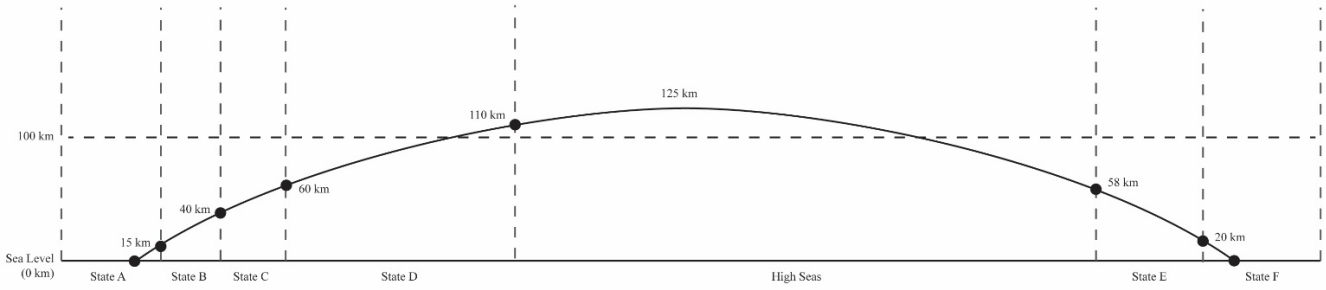
[213] Law of 17 September 2005 on the Activities of Launching, Flight Operation or Guidance of Space Objects (consolidated text, as revised by the Law of 1 December 2013), Belgium OJ, 15 January 2014, Chapter I, art 3, 1° (a). Online: < https://www.belspo.be/belspo/space/doc/beLaw/Loi_en.pdf >.

[214] Varlin Vissepo, "Legal Aspects of Reusable Launch Vehicles", 31 Journal of Space Law, (2005) 165 at 172.

[215] Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 56-57.

An aerospace object performing PTP international transportation, during the launch or descent phase, may traverse the airspace of different nations; therefore, as seen above, it may be identified as an international air service under Article 96(b) of the Chicago Convention. This conclusion would imply the integration of suborbital PTP operations under ICAO jurisdiction in order to uniformly regulate them and their interaction with civil aviation. However, one should note that if the flight moves through another State's airspace, such a functionalist approach would need to be integrated with a spatialist.[216] Indeed, in the perspective of suborbital PTP transportation, "a line of demarcation would serve to provide *significant assistance* in classifying such activity",[217] by establishing when, for example, the object is entering from outer space the airspace of a state different from that of its departure.

In this sense, States should work towards a combination of these approaches other than on "a common definition and the formulation of specific legal rules for such activities".[218]



As this thesis will explore, ICAO seems the most suitable solution in terms of rule elaborations and applicability.

[216] Su, "The Delimitation Between Airspace and Outer Space", *supra* note 157 at 368.
[217] Andrea J DiPaolo, " The Definition and Delimitation" supra note 153 at 632 [emphasis added].
[218] IISL, "Definition and Delimitation", *supra* note 130 at 2/4.

Chapter III

Suborbital PTP International Operations: Potential Consequences Under Air Law, Space Law, and General International Law

This Chapter, by also taking into consideration what has been discussed above, will explore whether the regimes of air law and of space law apply to suborbital operations. In doing so it projects to understand what their respective extent of applicability is, and whether they regulate suborbital operation in different – if not conflicting – ways. The Chapter further explores some of the fundamental legal consequences flowing from the potential application of the two regimes to suborbital operations and, in the case any of them is deemed to apply, seeks to envisage which international law principles are applicable and what consequences they bring.

1 Air law

1.1 The Chicago Convention

Article 1 of the Chicago Convention recognizes the pre-existing rule of customary international law, already codified in the Paris Convention, that "every State has complete and exclusive sovereignty over the airspace above its territory".[219] Territory is defined in Article 2 as "the land areas and territorial waters[220] adjacent thereto under the sovereignty, suzerainty, protection or mandate of such State".[221] Under the Chicago Convention, to foster and ensure uniformity, States are responsible for conforming their national legislation to the Standard and Recommended Practices (SARPs)[222] promulgated by ICAO and which are annexed to the Convention.[223] The Convention and the SARPs established by ICAO directly apply to international airspace and, through national implementation by individual States, to domestic airspace. Indeed, Article 12 provides that, "[e]ach contracting State undertakes to keep its own regulations [...] uniform, to the greatest possible extent, with those

[219] Chicago Convention, *supra* note 65, art 1.
[220] The United Nations Law of the Sea Convention specifies that "[e]very State has the right to establish the breadth of its territorial sea up to a limit not exceeding 12 nautical miles, measured from baselines determined in accordance with this Convention". See UNCLOS, *supra* note 197, art 3.
[221] Chicago Convention, *supra* note 65, art 2.
[222] *Ibid*, art 37.
[223] *Ibid*, art 54(l).

established [...] under this Convention,"[224] and further mandates that, "[o]ver the high seas, the rules in force shall be those established under this Convention".[225]

The Convention does not provide a definition of aircraft, which is contained in the Annexes as "any machine that can derive support in the atmosphere from reactions of the air other than the reactions of the air against the Earth's surface".[226] The Convention, however, distinguished between State and civil,[227] manned and unmanned aircraft.[228] No definition of State aircraft is provided; nevertheless, according to Professor Milde, to determine whether an aircraft is a State or civilian one, one should look at its function.[229] Following this functional approach, a commercial airline's aircraft used to carry troops will fall under the definition of State aircraft, and vice versa: a traditional military aircraft used for civilian purposes shall be considered as civil. Further, although the Convention is meant to "only apply to civil aircraft", it contains provisions that are specifically directed to State aircraft.[230] The functional definition of aircraft contained in the Annexes makes clear, as Professor Hobe indicates, that international air law does not apply to suborbital vehicles during portion of their operations when they do not receive support from the air.[231] Nevertheless, when suborbital vehicles during their ascendant and/or descendent phase derive support from reactions with the air, it seems reasonable to conclude that, for this portion of flight, ICAO could promulgate SARPs regulating them. Article 96(b), in fact, defines "international air service" as that "which passes through the air space over the territory of more than one State".[232] "Air service" is defined as a scheduled air service performed by aircraft for the movement of passengers or property,[233] and the enterprises which offer this service are identified as "airline".[234] Most parts of international suborbital PTP operations could fall under these definitions.

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[224] *Ibid*, art 12.
[225] *Ibid*.
[226] ICAO Annex 2, 7, 11, *supra* note 113.
[227] Chicago Convention, *supra* note 65, art 3.
[228] *Ibid*, art 8.
[229] Milde, *International Air Law and ICAO*, *supra* note 14 at 71.
[230] For example, art 3(d) provides that when issuing regulations for State aircraft, the Contracting State shall "have due regard for the safety of navigation of civil aircraft"; Art. 3(c), provides that State aircraft may not fly over, or land on, the territory of another State "without authorization by special agreement or otherwise, and in accordance with the terms thereof". See: Chicago Convention, *supra* note 65, art 3 (d), (c).
[231] Stephen Hobe, "The legal regime for private space tourism activities - An overview" (2010) 66 Acta Astronautica 1593 at 1594.
[232] Chicago Convention, *supra* note 65, art 96 (b).
[233] *Ibid*, art 96 (a).
[234] *Ibid*, art 96 (c).

Concerning the lack of a previous determination regarding the application of international air law to aerospace vehicles – namely, the Space Shuttle – at least when they fly through airspace, Professor Dempsey notes that:

> Functionally, the NASA Space Shuttle might not fall under the Convention on its ascent via rocket, but might on its descent, though it would still be exempt as a "State aircraft" under Article 3. A private launch, however, might fall within the safety and navigation provisions of the Convention and its Annexes.[235]

The Convention ties important consequences to the aircraft's nationality and registration.[236] Should suborbital vehicles devoted to international PTP operations fall within the definition of aircraft, under Article 17 they shall "have the nationality of the State in which they are registered".[237] Registration, or transfers of it, in any contracting State shall be pursued according to its domestic laws and regulations.[238] Article 18 prohibits registration in more than one State; nevertheless, it allows changing registration from one State to another.[239] Under Article 12 the element of nationality safeguards that:

> Each contracting State undertakes to adopt measures to insure that every aircraft […] carrying its nationality mark, wherever such aircraft may be, shall comply with the rules and regulations relating to the flight and maneuver of aircraft there in force. […] Each contracting State undertakes to insure the prosecution of all persons violating the regulations applicable.[240]

Indeed, under Article 31, States shall ensure the airworthiness of the aircraft bearing its nationality marks through the issuance of a certificate in accordance to Annex 8 of the Chicago Convention.[241]

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[235] Dempsey, *Public International Air Law*, *supra* note 18 at 64.
[236] Professor Cooper considered: "in some respects, the most important principle in aeronautical law is that aircraft have the characteristic termed "nationality."" The Professor, citing McDougal and Burke continues: "The possession of a nationality is the basis for the intervention and protection by a State; it is also a protection for other States for the redress of wrongs committed by those on board against their nationals". See John C Cooper, "Backgrounds of International Public Air Law" (1965) YB Air & Space L 3 at 31.
[237] Chicago Convention, *supra* note 65, art 17.
[238] *Ibid,* art 19.
[239] *Ibid*, art 18.
[240] *Ibid,* art 12.
[241] *Ibid*, art 31. See also ICAO, Annex 8 to the Convention on International Civil Aviation, Airworthiness of Aircraft, 11th ed (July 2008) [Annex 8]. As Professor Dempsey notes, "[i]n practice, the airworthiness certificate is initially issued by the State of aircraft manufacture, then validated by the State of the owner or operator of the aircraft". See Dempsey, *Public International Air Law*, *supra* note 18 at 61 n 45.

Similarly, the State concerned shall issue certificates of competency and licenses for crew and pilots aboard the aircrafts registered thereto[242] other than for aircraft radio equipment.[243] Further, States, upon request, should make available to ICAO or other Contracting States all information regarding the registration and ownership of the aircraft registered in their territory.[244] Considering the importance of such concepts, Professor Cheng, as will be seen below, supports the necessity of extending the nationality element to spacecraft and aerospace vehicles in order to provide more certainty on the application of rules and on their enforcement.

One should note, however, that the Convention does not impose that the effective ownership and control of the aircraft should reside upon the citizens of the registering State.[245] This may be a problem for the State of registration, which may have concrete difficulties to exercise its duties of monitoring the aircraft's airworthiness, especially nowadays where the phenomenon of aircraft leasing is the main driver of commercial civil aviation.[246] Nevertheless, to obviate such a potentially dangerous inconvenience, Article 83*bis* has been introduced to allow the transferring of the registration functions to the State which is in the better position to fulfill such regulatory requirements.[247] Therefore, the Convention allows for a system which calls for *the appropriate state to be always in the condition to ensure that the rules and regulations relating to the flight and maneuver of aircraft are complied with*. This is one of the key safety elements from which the suborbital industry could benefit. As seen below, international space law's provisions are more limited on these aspects.

Aircraft registration is further used in one of the most important provisions of the Chicago Convention that helps maintain uniformity of rules and safety: Article 33. The provision, indeed, obliges each Contracting State to recognize "[c]ertificates of airworthiness and certificates of competency and licenses issued or rendered valid by the contracting State in which the aircraft is registered, […] provided that the requirements under which […] [they] were issued or rendered valid are equal to or above the minimum standards which may be established from time to time pursuant

[242] Chicago Convention, *supra* note 65, art 32.
[243] *Ibid*, art 30.
[244] *Ibid*, art 21.
[245] And that may provide flags of convenience issue, which indeed, is accentuated by the registration of aircraft in States that differ from the State where there is effective control and/or ownership. For a broader view of the issue see Isabelle Lelieur, *Law and Policy of Substantial Ownership and Effective Control of Airlines*: *Prospects for Change* (Milton Park and New York: Routledge, Taylor & Francis Group, 2016).
[246] For a broad overview of aircraft leasing and the main role they play in international civil aviation see Donald P Hanley, *Aircraft Operating Leasing: a legal and practical analysis in the context of public and private international air law*, 2nd ed. (Alphen aan den Rijn: Wolters Kluwer, 2017).
[247] Chicago Convention, *supra* note 65, art 83*bis*.

[…] [the] Convention".[248] Should suborbital vehicles for PTP transportation be certified as aircraft, any state shall automatically recognize those certificates if they respect ICAO's minimum standards. This is one of the key elements to foster PTP international transportation as the operator would be subject to only one regime of certification.

The requirements of substantial ownership and effective control are not addressed in the Convention; nevertheless, this is a fundamental element of bilateral and multilateral air transport agreements which *de facto* halts the possibility of the flag of convenience phenomenon in air law.[249] Further, although airlines may fly aircraft registered in States other than those of their incorporation, their principal place of business, or the State that issued their operating certificate, such States would be responsible for ensuring that those aircraft *comply* with the ICAO standards.[250] Moreover, it is the practice of most States to limit airline certification exclusively to those companies owned and controlled by its citizens.[251]

The 19 Annexes to the Convention govern a wide range of aspects of international civil aviation such as safety, airworthiness, navigation, personnel licensing, and communications. Considering that aircraft and aerospace vehicles are users of the same airspace, it would seem appropriate that the international air law regime would govern both aircraft and aerospace vehicles. There is no need for "reinventing the wheel and crafting wholly new rules to govern only aerospace vehicles".[252] The reason why the Chicago Convention regime is the most suitable for aerospace activities will further be deepened in Chapter V of this thesis.

1.2 Private international air law

Should it be determined that international suborbital PTP transportations are operated by aircraft, the private international air law instruments dealing with its liability should apply. Indeed, none of these instruments provides a definition of aircraft or of carrier.
In this sense, Professor Dempsey states:

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[248] *Ibid*, art 33.
[249] Dempsey, *Public International Air Law*, *supra* note 18 at 62.
[250] *Ibid* at 62-63.
[251] *Ibid* at 60. Professor Dempsey however notes how "the European Union's promulgation of rules prohibiting Member States from imposing such requirements on European "community carriers" […] [may *de facto* contribute to erode the practice towards such requirement]." See *Ibid.*
[252] *Ibid* at 949.

> As the Organization that drafted the Montreal Convention of 1999 addressing air carrier liability […] ICAO could also clarify whether aerospace vehicles fall under […] [its] provisions as well.[253]

Since its inception, private international air law has been created to guarantee *uniformity* of specific rules across jurisdictions. This is reflected from the title itself of the 1929 *Convention for the Unification of Certain Rules Relating to International Carriage by Air*.[254] Indeed, in the 1920s, when commercial civil aviation was taking its first steps, governments agreed on the importance of creating a uniform regime to shield carriers from the potential financially-disrupting awards flowing from aviation disasters. At the time, key aspects of private international air law were regulated in either different or conflicting ways across jurisdictions, exposing both air carriers and air travelers (or, at times, their heirs) to serious legal problems in protecting their respective interests or foreseeing potential results.[255] Uniformity of the law in these aspects was therefore necessary to overcome such fragmentation of rules. This motivated the creation of the Warsaw Convention, the principal purposes of which are: the uniformity of law for carrier liability and the limitation of such liability so as to allow industry development,[256] versus a simplified recovery procedure for the passenger which shall not prove the carrier's negligence in order to obtain its recovery.[257] Therefore, the private international air law regime balances different interests at stake. As will be seen below, this does not happen under international space law. Despite the success of the Warsaw Convention, its main issue is the amount of the liability cap which, over the years, has become increasingly insufficient due to inflation. Indeed, the Convention has been subject to updating efforts which have, nevertheless, led to fragmentation rather than unification of law.[258] Finally, the Montreal Convention of 1999, which aims at replacing

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[253] *Ibid* at 959-960.
[254] Warsaw Convention, *supra* note 52.
[255] Dempsey, *Aviation Liability Law, supra* note 51 at 309. See also Reed v. Wiser, 555 F.2d 1079 at 1090 (2nd Cir. 1977); *Dunn v. Trans World Airlines, Inc.,* 589 F.2d 408 at 410 (9th. Cir. 1979).
[256] Paul S Dempsey and Michael Milde, *International Air Carrier Liability: The Montreal Convention of 1999* (Montreal: McGill University Center for Research in Air and Space Law, 2005) at 11.
[257] Andres Lowenfeld and Allen Mendelsohn, "The United States and the Warsaw Convention" (1967) 80 Harv. L. Rev. 497 at 519-522.
[258] *Protocol to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air signed at Warsaw on 12 October 1929*, 28 September 1955, ICAO Doc 7632; *Additional Protocol No. 1 to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air signed at Warsaw on 12 October 1929*, 25 September 1975, ICAO Doc 9145; *Additional Protocol No. 2 to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air signed at Warsaw on 12 October 1929 as Amended by the Protocol done at The Hague on 28 September 1955*, 25 September 1975, ICAO Doc 9146; *Additional Protocol No. 4. to Amend the Convention for the Unification of Certain Rules Relating to International Carriage by Air signed at Warsaw on 12 October 1929 as Amended by the Protocol done at The Hague on 28 September 1955*, 25 September 1975, ICAO Doc 9148.

the Warsaw system, provides a comprehensive regime of liability and has also been provided with a mechanism to adjust the liability cap over time.[259] The principal differences and similarities between the Montreal Convention's liability provisions regarding death and injury of passenger and damage to cargo are the following.

Both liabilities are not tied to any ticketing or air waybill requirements.[260] Article 11, however, provides that the air waybill or cargo receipt is *prima facie* evidence of the contract, number of packages, weight, apparent condition, and acceptance of cargo.[261] Therefore, because under Article 22 liability is determined by the shipment's weight, the consignor has an interest in complying with document requirements.[262] Liability for personal injury or death is triggered if the injury or death is *caused* by an art. 17 *accident*, and for damage to unchecked baggage by *fault.*[263] Liability for loss and damage to cargo is triggered if the damage so sustained is *caused* by an Article 18 *event*.[264] *Accident* is neither synonymous with *event*, which is broader in scope, nor with the stricter term *fault* or *negligence*: it is rather a fortuitous, unintentional, and unexpected event external to the passenger and causally linked to aircraft operations, e.g. a crash due to mechanical failure, error in piloting, act of God. In fact, as *accident* may be defined only by context, there must be a causal connection with aircraft operation to fall into Article 17's significance.[265] On the other hand, *event*, per se, may include *any* event that causes the loss or damage to cargo. Therefore, to trigger liability for personal injury, a passenger must prove that the cause was an *accident* on board or during any operations of embarking and disembarking, while for loss or damage to cargo, it is enough to prove that the cargo did not arrive at all or that it arrived damaged. The broader significance of *event* must be seen in the consignor surrendering of the cargo's control to the carrier who assumes responsibility. This is also evidenced by Article 18's "in charge of the carrier", which indicates the event happens when the cargo is under the control of the carrier, who has a duty of preservation. Article 21 divides liability for damage arising out death or injury into two tiers: the first strict up to 113,100 SDRs; the second presumptive and *unlimited* unless the carrier proves it was free from negligence or other wrongful act or omission or

[259] Montreal Convention, *supra* note 57.
[260] *Ibid*, arts 3(5) and 9, respectively.
[261] *Ibid*, art 11.
[262] *Ibid*, art 22.
[263] *Ibid,* art 17.
[264] *Ibid,* art 18.
[265] For an exhaustive examination of art 17 of both Warsaw and Montreal conventions see Paul S Dempsey, "Accidents and Injuries in International Air Law: The Clash of the Titans" (2009) 34 Annals Air & Space L 285.

that damage was *solely* due to negligence or other wrongful act or omission of a third party.[266] Article 22 limits the liability for cargo to 19 SDRs per kg to be calculated only in relation of the part damaged or lost unless this affects other parts or the whole shipment. The cargo liability ceiling is *unbreakable* unless (and up to) a special declaration of interest and a payment is made by the consignor when he handed the package over the carrier.[267] The limits of both liabilities do not prevent the court from awarding court costs and interests if the damage is greater than the sum the carrier has offered in writing before the action or within 6 months of the occurrence.[268] The carrier may be exonerated from both liabilities, wholly or partially, if, under Article 20, it *proves* that the damage was caused or contributed to by negligence or other wrongful act or omission of the claimant or of the person from whom the claimant derives such rights.[269] However, only for loss or damage to cargo may the liability be wholly or partially excluded if damage derives from defect or vice of the cargo or its packing, act of war, or of public authority.[270] Although under Article 25 the carrier may stipulate higher or no limits for both liabilities,[271] under Article 26 any provision tending to relieve the carrier of the Convention's liability or to fix lower limits is null and void.[272] Further, a carrier may waive any Convention's liability defense available under Article 27.[273] Any action for damages, *however founded*, could be only brought subject to the limits of the Convention[274] and within the 2-year period of limitation of Article 35.[275] However, in case of damage to cargo, the carrier must be notified in *writing* (by whom is entitled to delivery) within 14 days of when the cargo is received.[276] In case of personal injury, action may be brought by the injured passenger or whomever has such right under local law.[277] In case of successive carriage, action for injury may be brought against the carrier in which the accident occurred save the first has assumed the liability for the whole journey. In case of loss or damage to cargo, action may be brought only by: the consignor against the first carrier, the consignee against the last, each against the one on which the damage or loss occurred.[278] In case of carriage falling within Articles 39, 40 and 41,

[266] Montreal Convention*, supra* note 57, art 21.
[267] *Ibid,* art 22.
[268] *Ibid,* art 22(6).
[269] *Ibid,* art 20.
[270] *Ibid,* art 18(2).
[271] *Ibid,* art 25.
[272] *Ibid,* art 26.
[273] *Ibid,* art 27.
[274] *Ibid,* art 29
[275] *Ibid,* art 35.
[276] *Ibid,* art 31.
[277] *Ibid,* art 29.
[278] *Ibid,* art 36.

liability rules between contracting and actual carrier will apply.[279] Action for both liabilities may be brought in the same venues provided by Articles 33 and 46; however, a so called 5th jurisdiction is available only for damages resulting from injury.[280] Article 34, nevertheless, allows to settle by arbitration a dispute relating to the carrier's liability for cargo.[281]

1.3 The Rome Convention of 1952

The Rome Convention of 1952[282] governs the surface damages caused by foreign aircraft in flight or by any person or things falling therefrom.[283] Under Article 2(3) the registered owner is presumed to be the operator of the aircraft for which liability is not fault based but strict[284] and limited based upon the weight of the aircraft with a cap on the amount of 33,000 USD for each person killed or hurt on the ground, for a total amount of around 700,000 USD per incident.[285] No person who solely caused the damage is entitled to recover and the claimant who contributes is subject to comparative fault.[286] No recovery is provided in the case of damage as a direct consequence of armed conflict or disturbance[287] but, in the case the damage flows from the intention of the operator's employees, liability is not capped.[288] The Rome Convention entered into force in 1958; however, it did not receive the same success as the Warsaw 1929 or Montreal 1999 Conventions. Indeed, fewer than 50 States have ratified it. Much less successful have been the attempts to modernize the Rome 1952 system such as the Montreal Protocol of 1978[289] and the Montreal Convention of 2009.[290] The main flaw of these Conventions, which attempt to unify the rules regarding damages caused to the ground by international aircraft in flight, is their incapability of adequately reconciling the two opposite interests at stake: on one side, the victims' need for adequate compensation, which is further strengthened by the fact that at the moment of the damage, they are not users of the service, and on the other the aviation sector's

[279] *Ibid,* arts 39, 40 and 41.
[280] *Ibid,* art 33 (2).
[281] *Ibid,* art 34.
[282] *Convention on Damage Caused by Foreign Aircraft to third Parties on the Surface,* 7 October 1952 (entered into force 4 February 1958), ICAO Doc. 7364 [*hereinafter* Rome Convention 1952].
[283] *Ibid*, art 1(1).
[284] *Ibid.* art 2.3.
[285] *Ibid,* art 11.
[286] *Ibid,* art 6.
[287] *Ibid*, art 5.
[288] *Ibid*, art 12.
[289] *Protocol to Amend the Convention on Damage Caused by Foreign Aircraft to third Parties on the Surface,* 7 October 1952, *23 September 19*78, ICAO Doc. 9257.
[290] *Convention on Compensation for Damage Caused by Aircraft to Third Parties,* April 2009 [*hereinafter* General Risk Convention].

need for adequate protection from financial disruption through appropriate cap and liability designations.[291]

Liability under private international law is oriented at balancing the interests of the industry *vis-à-vis* that of the victims. This regime would provide a clear path for suborbital operators who could adjust their business model accordingly. Professor Dempsey notes that such a regime is "for the highly developed air travel industry [and it] might be too restrictive to foster growth in the commercial space industry."[292] One should note that under international space law, liability is imposed entirely onto States and is completely victim oriented. This, as will be discussed below, would create an even greater burden for a nascent industry. Perhaps, as seen in the conclusion of this thesis, under an evolutionary point of view, the adoption of an *ad hoc* regime of private international aerospace law has merit.
Overall, the international legal regime governing air transport is well and comprehensively developed in several key areas such as liability, safety, security, navigation, traffic management, etc. Further characteristics of this regime and of its capacity of adapting to arising needs is examined in Chapter V with a perspective of being the most suitable model to cover aerospace activities.

2 International space law

Space law treaties provide principles governing the "*activities of States"* in the exploration and use of *a specific geographical area*, outer space.[293] Indeed, the commercial use of space was not taken into serious consideration during the Outer Space Treaty negotiations in the mid-1960s.[294] Should suborbital PTP operations be considered space activities, there are two main consequences that differ from air law: 1) there would not be a comprehensive system of rules backed by a centralized international institution which also guarantees their uniformity; 2) international liability (and responsibility) is entirely shifted onto the States and is unlimited.[295] This, as seen below, would

[291] Dempsey, *Aviation Liability Law*, *supra* note 51 at 239, 245.
[292] Dempsey, *Public International Air Law, supra* note 18 at 945-946.
[293] Outer Space Treaty, *supra* note 101 at title and the Preamble.
[294] Dempsey, *Public International Air Law*, *supra* note 18 at 941.
[295] Indeed, differently from the international air law regimes, which impose liability upon the operator, international space law only addresses the responsibility and liability of States for space activities. Of course, placing unlimited liability upon the States rather than a limited one on the operators constitutes a high burden for States which, in the attempt of shielding themselves from liability, would impose high insurance coverage onto the operator. Indeed, few are the states such as the US, which, in the attempt to limit the liability of the providers, accept onto them to cover it until a certain amount. See 51 USC § 50914, § 50915.

drastically complicate the development of the industry, especially in terms of a lack of safety, regulatory fragmentation, and financial constraint.

2.1 Article VI of the Outer Space Treaty

Article VI of the OST introduces the principle for which "States Parties to the Treaty shall bear international responsibility for national activities in outer space".[296] The term "national", although not defined, encompasses both the activities of governmental agencies,[297] to which the treaty directly apply as they are directly conducted by and attributed to bodies of the State,[298] and those of non-governmental entities which are natural and legal persons of private law, including research organizations even when run as public statutory corporations.[299] "National" further distinguishes activities of international organizations.[300]

There is no uniformity of opinion, however, on which activities of non-governmental entities fall under Article VI "national". Considering that Article IX of the OST provides the obligation of international consultation should the activity of a State or of *its nationals* potentially be harmful towards other States,[301] one may be tempted to conclude that nationals is intended to refer solely to the persons having the State concerned nationality, wherever they may be, such as, for example, in the 1986 UK Outer Space Act.[302] Some other States, however, include in the term "national activities" all those activities "by whomsoever carried on within the jurisdiction of a State".[303] This would include territorial, quasi-territorial, and personal jurisdiction[304] - such as is the case in the US legislation.[305] It

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[296] Outer Space Treaty, *supra* note 101, art VI.
[297] To date, there is no case of governmental agency exercising state authority for more than one state. See Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl (eds), *Cologne Commentary on Space Law*, Vol 1 (Koln: Carl Heymanns Verlag, 2009) at 111 para 37 [*hereinafter* Cologne Commentary on Space Law].
[298] See ILC, *Articles on Responsibility of States for Internationally Wrongful Acts*, UN Doc A/56/83 (2001), art 4 [*hereinafter* ILC, Articles on State Responsibility].
[299] Cologne Commentary on Space Law, supra note 297 at 110 para 35. The nature of public or private entities, natural or juridical persons, ought to be established according to the applicable domestic law and, when necessary, in accordance to the principles of international law regarding nationality.
[300] Outer Space Treaty, *supra* note 101, art VI. "international organization" refers only to an intergovernmental organization which has its own legal personality at the international level. Responsibility of compliance with the treaty is borne by both the organization and the States Party to the treaty. See Cologne Commentary on Space Law, *supra* note 297 at 123 para 81.
[301] Outer Space Treaty, *supra* note 101, art IX.
[302] For example, see United Kingdom Outer Space Act 1986 at 2.
[303] Cheng, *Studies in International Space Law*, *supra* note 85 at 634.
[304] *Ibid*. And, therefore, activities of any person (including foreigner) within the national boundaries (territorial jurisdiction); activities carried on by objects (and/or by persons onboard) registered in a State, anywhere (quasi-territorial jurisdiction); activities carried out by nationals wherever they may be (personal jurisdiction). See scheme provided by Dr. Cheng, *Ibid* at 635. See also Cologne Commentary on Space Law, *supra* note 297 at 113 para 46.
[305] 51 U.S. Code § 50905 (a) (1), § 50902 (15).

seems in line with the object and purposes of the Treaty that the term "national" shall be interpreted as comprehensively encompassing *all* activities in outer space under a State effective jurisdiction.[306]

Although the wording "activities *in* outer space"[307] seem a purely temporal and geographical requirement, i.e. when such activities are in outer space, it shall be interpreted as referring to the *scope* of the activity. Therefore, activities involving the exploration and use of outer space may include even those that, at a given moment, are not *in* outer space[308] (for example an attempted launch or launching a payload before reaching space as indeed was later confirmed in the Liability Convention[309]). Nevertheless, should it be established that PTP suborbital flights do not aim to reach and operate *in* outer space, *Article VI will not apply to them.* On the contrary, should they be recognized as a space activity, several consequences will follow for the State having jurisdiction.

Article VI provides a series of obligations for States with regard to "national activities in outer space":

- ensuring that such activities are carried out *in conformity with the treaty provision*;
- bearing *international responsibility* for such activities;

And, when the national activity is carried out by a non-governmental entity:

- the entity shall be subject to *authorization and continuing supervision* by the *appropriate State(s)*.[310]

The article, nevertheless, does not provide any definition of "appropriate State", nor does it provide the extent to which the State in question should bear "international responsibility". Further, there is no definition of the State's obligation of "continuing supervision", nor does the article specify a form of "authorization" the State shall prescribe to authorize such activities.

2.1.1 *Sui generis* meaning against the traditional concept of States' responsibility

Although under international law, State responsibility - generally - only arises when the act or omission complained of is attributable to a State,[311] under Article VI of the OST, the traditional requirement of "attributability" of responsibility has been removed. There is, indeed, no need to establish and prove

[306] Cheng, *Studies in International Space Law*, *supra* note 85 at 632. See also Bin Cheng, "Article VI of the Outer Space Treaty Revisited: 'International Responsibility', 'National Activities', and the 'Appropriate State'" (1998) 26:1 J of Space L 7 at 24 [*hereinafter* Cheng, Article VI Revisited].
[307] Or "activities carried on *in* outer space", Outer Space Treaty, *supra* note 101, art VI [*emphasis added*].
[308] Cheng, *Studies in International Space Law*, *supra* note 85 at 635. See also Cologne Commentary on Space Law, *supra* note 297 at 107 para 21 and at 109 para 27.
[309] Liability Convention, *supra* note 111, art I(b).
[310] *Ibid*.; Outer Space Treaty, *supra* note 101, art VI.
[311] ILC, ARS, *supra* note 298, art 2(a).

an "act of State" to hold a State responsible, but it is sufficient that this latter has (effective) jurisdiction over the activity. In the words of Judge Manfred Lachs, "the acceptance of [article VI] principle removes all doubts concerning imputability".[312] This *sui generis* meaning, based on Principle 5 of the UNGA resolution 1962 (XVIII) of 13 December 1963, constitutes the result of a compromise between Russia and the United States,[313] and is arguably customary in nature.

2.1.2 What is the extent of international responsibility?

Although the terms responsibility and liability are often used interchangeably,[314] one should note that liability has a narrower sense, referring to the "obligation to make reparation for any *damage* caused".[315] The responsibility of Article VI is tied to *activities* and must not be confused with Article VII's liability of States for damage caused by a *space object,* which is tied to this latter.[316] Responsibility attaches to the State that has jurisdiction over the activity; however, while more States may have jurisdiction over a certain activity, not all necessarily have effective *jurisaction*.[317] Therefore, while it is correct to say that all States having jurisdiction shall bear international responsibility, the State which shall especially be held internationally responsible is the one which can actually exercise its *jurisaction* over the activity.[318]

Liability attaches to the State(s) *involved in a space object's launch*. Indeed, liability follows the object launched or attempted to and is independent of whether or not the State can control the object's activity: once the State qualifies as one of the four launching States, i.e. the one which launches or procures the launching or from whose territory or facility an object is launched,[319] it would trigger the application of Article VII, making the launching State exposed to internationally liability as long as

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[312] Manfred Lachs, *The Law of Outer Space, supra* note 171 at 22.

[313] UNGA Res 1962 (XVIII), *supra* note 96 at principle 5. Further, the drafting history confirms that while Russia wanted that "all activities […] shall be carried out solely and exclusively by the states", the US, which already had projects of privately-operated telecommunication satellites, rejected this proposal. Indeed, a compromise in such sense seemed necessary. See W B Wirin, "Practical Implications of Launching State-Appropriate State Definitions", (1994) 37 Proc. Colloq. L. Outer Space 109 at 110.

[314] Indeed, the Russian, French, Chinese and Spanish versions of the OST, which are official languages of the Treaty, do not differentiate the terms liability and responsibility.

[315] Cheng, Article VI Revisited *supra* note 306 at 10 [emphasis added].

[316] Outer Space Treaty, *supra* note 101, art. VI and VII.

[317] There are three types of Jurisdictions: Territorial; Quasi-territorial; and Personal. Each of them has two elements, *jurisaction* and *jurisfaction*. While *jurisfaction* of different states may coexists, *jurisaction* is subject to a hierarchy. Indeed, *territorial* jurisaction overrides quasi-territorial and personal jurisaction, and quasi-territorial ovverides personal. See Cheng, Article V Revisited, supra note 306 at 24.

[318] Cheng, *Studies in International Space Law*, *supra* note 85 at 636. See also Cheng, Art VI Revisited, *supra* note 306 at 25.

[319] Outer Space Treaty, *supra* note 101, art. VII.

the space object (and its component parts) exists. Such a situation may actually be inconvenient for certain States.[320]

Under Article VI, international responsibility "means essentially answerability, answerability for one's acts and omissions, for their being in conformity with whichever system of norms […] as well as answerability for their consequences",[321] which imposes a duty to make reparation.[322] However, because responsibility is not tied to damage but rather to the breach of the obligation imposed by Article VI, reparation may take various forms,[323] including guarantees of non-repetition.[324] Indeed, the importance of attributing international responsibility shall be seen not solely as a means to allocate risk but especially as an instrument to ensure the enforcement of standards, rules of conduct, application of rules etc. Should suborbital PTP activities be recognized as space activities, the concerned State(s) shall ensure the necessary measures are put in place to comply with article VI to avoid being held responsible. Nevertheless, because Article VI does not specify the extent of this international responsibility, as Professor Cheng has pointed out, such uncertainty can give rise to two equally acceptable but very different interpretations. A narrow one leads to responsibility only for those acts or omissions of non-governmental entities that, if they had been committed by a governmental agency, would have triggered international responsibility. A broad one would extend international responsibility to criminal, contractual and tortious liabilities under municipal law.[325] If the extent of Article VI's international responsibility is not uniformly perceived, regulatory requirements for the PTP suborbital industry may vary among States, resulting in an unnecessary burden to the industry's development.

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[320] For example, imagine a national of State A, which owns and controls a space object engaged in a space activity that is authorized under Article VI and launched from the same State, transfers the ownership and control of the object to a national of State B. In this scenario, the State which originally responsible for the activity, *i.e.* state A, should not be responsible anymore as indeed it no longer has jurisdiction over the activity while State B, which is the one under which law the transferee operates, should be internationally responsible under Article VI. Nevertheless, since State A is the launching State from which the object was launched, it will continue to remain liable for any damage such object may cause in space to an aircraft in flight or on Earth. This scenario illustrates that without an agreement between State A and B in which B assumes the liability for A, the latter will be liable for an object the activity of which cannot be continuously supervised and over which it does not have jurisaction. At any event, any such agreement will not be enforceable *vis-á-vis* third States.

[321] Cheng, "Article VI Revisited", supra note 306 at 9.

[322] ILC, Articles on State Responsibility*, supra* note 298, art 31.

[323] Cheng, "Article VI Revisited", supra note 306 at 9.

[324] *Ibid*; see also ILC, Articles on State Responsibility*, supra* note 298, art 30 (b).

[325] Cheng, S*tudies in International Space Law, supra* note 85 at 633-634.

2.1.3 Appropriate State

Article VI imposes upon a singular *appropriate State Party* the obligation of authorization and continuing supervision of the activities of non-governmental entities. But which State is an *appropriate State*? Article VI does not provide any definition for the term "appropriate State", the content of which has been an object of debate. Nevertheless, the term "appropriate" should not be read as a new legal term such as that of *launching* State of Article VII.[326] Therefore, one should look at the international and national principles of law to determine which State is appropriate.

The appropriate State to authorize and continuously supervise such activities is the one responsible for them.[327] The sole State that can bear international responsibility in this sense should be the one which has jurisdiction, in both its two elements of *jurisfaction* and *jurisaction* over the activity.[328] Indeed, it would not appear reasonable that Article VI, on one side, holds responsible every State Party for the activity of non-governmental entities over which they have jurisdiction and, on the other, precludes or does not oblige them to exercise the duty of authorization and continuing supervision.[329] It would be against the interest of any State exposed to international responsibility (and liability) not to be able to authorize and continuously supervise the activity.[330]

Following this, should suborbital PTP operations be framed as space activities, the element of jurisdiction in a such operation, which transports passengers from State A to State B and vice versa from B to A, would require the two respective States to fulfill the obligation of authorizing and continuously supervising the activity, and both have an interest in not being held internationally responsible and/or liable. Indeed, as both would be a "launching State", they have an interest in exercising jurisdiction and control over the activity of the space object since they would be held liable for the damages it causes. Nevertheless, Article VI does not specify the exact content of the authorization and continuing supervision, which is left to the States' discretion. A potential solution in this sense is an *ad hoc* agreement among the concerned states. But as discussed below in this thesis, from the analysis of the collaboration between Italy and the US in the attempt to develop suborbital PTP international operations between the two, there are significant differences between their

[326] Cologne Commentary on Space Law, *supra* note 297 at 111 para 39.
[327] *Ibid* at 117 para 58.
[328] Cheng, *Studies in International Space Law*, supra note 85 at 622-623.
[329] Cheng, "Article VI Revisited", supra note 306 at 28.
[330] *Ibid*.

respective legal regimes which would risk creating difficulties in establishing similar requirements among the two countries.[331]

Professor Cheng reminds us that the appropriate State to be held internationally responsible and which constitutes the appropriate one to authorize and continuously supervise the activity should be the one which has the *overriding jurisaction*.[332] In the example above, if the activity qualifies as space activity, once the flight arrives in State B from State A, State B has the overriding *jurisaction* over the activity and therefore it constitutes the appropriate State under Article VI. This situation does not exclude Article VI's international responsibility of State A. A, in fact, would have a residual responsibility as its *jurisaction* may subsequently be operative (for example, because the flight is in international airspace or outer space returning to destination A).[333] The situation further complicates if more than two States are involved.

Clearly, there potentially may be various *appropriate* States for the same activity, all of which shall ensure the establishment of a regime of authorization and continuing supervision.[334] Within this perspective the private suborbital operator may be simultaneously subjected to the authorization and control of different States and under different requirements (standards, obligations, restrictions) which is highly inconvenient for the industry.[335] Therefore, any international suborbital PTP operation, if falling under space law, would require a multilateral agreement to streamline and appropriately delegate the licensing, continuing supervision, and liability obligations among the parties. Any such agreement will also partially diminish the burden on private companies. On the other hand, under the aviation law regime, article 33 of the Chicago Convention imposes the recognition of certifications if they meet ICAO minimum standards,[336] and Article 83*bis* allows, through an agreement, the transfer of functions and duties of the State of the aircraft's registration onto another Member State (for example, the one in which the aircraft is leased). Further, contrary to the silence of the Registration Convention about registering any subsequent agreement in the international registry, Article 83*bis* imposes on the States subject to the agreement the need to notify ICAO which, in turn, will spread the notice to the whole international aviation community of States. Indeed, under Article 83*bis* of the Chicago Convention, the State of registry is relieved of the responsibility transferred to the new

[331] *See infra* Chapter IV at 3.
[332] Cheng, "Article VI Revisited", supra note 306 at 29.
[333] Cheng, *Studies in International Space Law*, *supra* note 85 at 636.
[334] *Ibid* at 635.
[335] Cheng, "Article VI Revisited", supra note 306 at 28.
[336] Chicago Convention, *supra* note 65, art 33.

State.[337] Under Article VI of the OST, on the contrary, such agreement may be effective only among the parties of it.[338]

2.2 Does the OST provide a different path than that of general international law with regards to the attribution of State jurisdiction over a space activity?

Opinions on how to establish jurisdiction vary among scholars. It is common to find conclusions based on Article VIII of the OST[339] or Article II of the RC[340] as the sole means to identify when an activity of a non-governmental entity is national and who the appropriate State is.[341] Indeed, a State Party on whose registry an object is carried, shall retain jurisdiction and control over the object.[342] In this sense, the activities of this object should be considered as the State of registry's national activities for which it becomes internationally responsible under Article VI of the OST.[343] But is jurisdiction exclusively dependent on registration? "[N]otwithstanding Article VIII of the Space Treaty, registration and jurisdiction are not always tied together as stated in that article."[344] For example, under Article II of the RC, States are permitted to alter such a link between registration and jurisdiction through an agreement between them.[345] Further, registration and jurisdiction are not tied together when "space objects are being launched jointly by several States either directly or indirectly, through or together with an international organization."[346] One should also note that, to date, "[n]o national legislation on outer space activities exists that is applicable to activities undertaken by a space object registered in that State (ie where the registration of a space object determines the applicability of a legislation for activities in outer space)."[347] Limiting the attribution of jurisdiction to Article VIII of the OST or II of the RC embraces the risk of excluding other concrete hypotheses, which is not what Article VI of the OST provides for.

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[337] *Ibid*, art 83*bis*.
[338] Cheng, *Studies in International Space Law*, *supra* note 85 at 661; See also VCLT, *supra* note 144, art. 34.
[339] Outer Space Treaty, *supra* note 101, art VIII.
[340] Registration Convention, *supra* note 112, art II.
[341] Henri A Wassenbergh, "The Law Governing International Private Commercial Activities of Space Transportation" (1993) 21 J Space L 97 at 109.
[342] Outer Space Treaty, *supra* note 101, art VIII; Art II RC, reminds the effects of registration under art VIII OST. Nevertheless, it also envisages the possibility for States to conclude, among them, agreements on jurisdiction and control over the object and personnel thereof. See Registration Convention, *supra* note 112, art II.
[343] Cheng, "Article VI Revisited", *supra* note 306 at 20.
[344] Cheng, *Studies in International Space Law*, *supra* note 85 at 657.
[345] Registration Convention, *supra* note 112, art II.
[346] Cheng, *Studies in International Space Law*, *supra* note 85 at 657.
[347] Cologne Commentary on Space Law, *supra* note 297 at 114 para 47.

Last but not least, Article II of the RC provides the obligation to register a space object in the national State registry when this is launched "into earth orbit or beyond".[348] The corollary of this rule is that:

> If a space object is not launched 'into earth orbit or beyond' it would not be required to be registered; e.g. an object sent only on a sub-orbital flight.[349]

Therefore, suborbital operations fall out of the RC scope.

The OST does not provide for a new and different path than that of general international law with regards to the identification of a State's jurisdiction over an activity, nor is there any evidence in this sense in the *travaux preparatoires*.[350] Therefore, a State has jurisdiction over a space activity carried out from its territory as well as carried out by its nationals (physical or juridical person) and over an activity carried out by using objects registered in its national registry.[351] Notwithstanding this, as seen above, a State would not always have effective *jurisaction* over those space activities. It is however clear that more States may have jurisdiction over an activity.

Although most State practices seem to adhere to this interpretation, there is no uniformity of criteria in the attribution of jurisdiction.[352] On the other hand, as seen above, in air law the link between jurisdiction and registration is straightforward. Clearly, certainty of the law would be higher if suborbital operation fell under international air law.

2.3 Article VII of the Outer Space Treaty

Article VII addresses only the general international liability of the launching State towards another State party (and of its persons and properties) that suffers damage caused by the launching State's space object.[353] Article VII imposes liability irrespective of the nationality of the operator or jurisdiction over the space activity. Indeed, as seen above, a State is exposed to liability when launches, procures a launch, or allows to launch from its territory or facility; therefore, all States participating in

[348] Registration Convention, *supra* note 112, art II.
[349] Ram S Jakhu, Bhupendra Jasani and Jonathan C McDowell, "Critical issues related to registration of space objects and transparency of space activities", Acta Astronautica 143 (2018) 406 at 407 para 2.2.1.
[350] Cologne Commentary on Space Law, *supra* note 297 at 113 para 46.
[351] *Ibid*.
[352] *Ibid* at 114 para 47.
[353] Outer Space Treaty, *supra* note 101, art VII. See also: Cologne Commentary on Space Law, *supra* note 297 at 135 para 30.

a launch are jointly and severally liable. Pursuant to Article VI, Article VII extends also to privately operated space objects. The scope of Article VII is to ensure there is always at least one State that will assume liability for the damage caused by a space object. Such rationale, which finds its justification in the ultrahazardous nature of the activity, must be understood in the context of the geopolitical situation at the time of the Treaty drafting when only two States were capable of conducting space activities. However, how does one define an activity as ultrahazardous? Aviation today cannot be considered as such; on the contrary, it is the safest transportation means.[354] Indeed, the identification of an activity as ultrahazardous may come not only from the nature of the activity itself but also from the regulatory infrastructure surrounding it.

Although the four categories of launching States of Article VII of the OST are repeated verbatim in Article I of the RC and I of the LC, no definition is given of them. Nevertheless, while for some categories of launching State their identification is straightforward, for others it is unclear. For example, what is the meaning of procuring a launch? It leaves room for different significates,[355] each of which may involve the liability of numerous and different States' parties, some not necessarily visible as participants to the launching.[356] Such a situation may on one side be used to avoid liability, leaving room to potential flag of convenience attitudes, which could seriously endanger safety, and on the other, the hypersensitivity of Sates towards the risk of being held liable may impose insurance requirements that could potentially cover all the Sates involved, even those that may be indirectly exposed. Should nascent suborbital PTP operations be considered as space activities, potential financial coverage requirements arising from such uncertainty may create an unsurmountable burden.

Article VII's State liability is one of the OST principles recognized as general international customary law.[357] This, however, has left unresolved a series of questions, such as whether liability is strict or absolute, what type of damage is contemplated, whether different principles should govern depending on where the damage occurs (aircraft, surface of the earth, outer space), whether liability is

[354] IATA, *Safety Report 2017*, 54th ed (2018) at 1.
[355] "Procure" essentially means causing something to be done or obtaining something. This leaves a broad range of subjects that could fall under this category. See Jonathan Law and Elizabeth A Martin (eds), *Oxford Dictionary of Law,* 7th ed (Oxford: Oxford University Press, 2014). See also Stephan Hobe, Bernhard Schmidt-Tedd & Kai-Uwe Schrogl (eds), *Cologne Commentary on Space Law*, Vol 2 (Koln: Carl Heymanns Verlag, 2013) at 114 para 61.
[356] Valérie Kayser, *Launching Space Objects: Issues of Liability and Future Prospects*, (New York, Boston, Dordrecht, London and Moscow: Kluwer Academic Publishers, 2001) at 34 [*hereinafter* Kayser, *Launching Space Objects*].
[357] Dimitri Maniatis, "The Law Governing Liability for Damages Caused by Space Objects" (1997) 22:1 Annals Air and Space L 369 at 376.

unlimited,[358] and what the venues for compensation and respective claims procedures are, etc.[359] As seen below, very few of these questions have been addressed by the Liability Convention. However, all such issues have already been addressed in detail under international air law for almost a century.

In 1964, during the OST negotiations, the US advanced a draft convention proposing the establishment of "absolute liability" for the launching State, which would only be exonerated due to "a willful or reckless act or omission" of the claimant State. Nevertheless, the US withdrew such a proposal, making room for the – less clear – proposal of the Soviet Union advanced in 1966, providing that a launching State would be "internationally liable for damage".[360] Such broad meaning was further confirmed by US Ambassador Goldberg during a hearing in front of the US Senate Committee on Foreign Relations.[361]

Uncertainty also arises with regard to the type of damage contemplated by Article VII which, by holding a State liable in case of damage by a space object, appears to cover only direct damages. At the US senate Hearings on the OST Ambassador Goldberg affirmed, "I think any reasonable interpretation of that clause would mean physical damage".[362] Although physical damage includes personal injury or loss of life other than damage or destruction to properties, it is questionable whether it encompasses indirect damages,[363] i.e. liability for damage in circumstances where the chain of causation has been interrupted.[364]

Compensation shall be interpreted as *restitutio in integrum,*[365] which, of course, is not always possible (i.e. in case of death/permanent injury or destruction/damage of non-replaceable items). Therefore, the concept that money should compensate for harm, widely accepted in international and municipal law, applies even here.[366] In this sense, the principles of international law identified in the Chorzów Factory case[367] should apply to Article VII.

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[358] Carl Q Christol, "International Liability for Damage Caused by Space Objects" (1980) Americal J Int L 74:2 346 at 351 [*hereinafter* Christol, "International Liability for Damage"].
[359] Ogunsola O Ogunbanwo, *International Law and Outer Space Activities* (The Hague: Nijhoff, 1975) at 143 [*hereinafter* Ogunbanwo *International Law and Outer Space*].
[360] Christol, "International Liability for Damage" *supra* note 358 at 353-354.
[361] Treaty on Outer Space: Hearings before the Senate Coram, on Foreign Relations on Executive D, 90th Cong., 1st Sess (1967) at 39.
[362] *Ibid.*
[363] Ogunbanwo, *International Law and Outer Space*, *supra* note 359 at 144.
[364] Kayser, *Launching Space Objects*, *supra* note 356 at 48.
[365] Which means to repristinate things at the same status as that before the damage occurred.
[366] Christol, "International Liability for Damage", *supra* note 358 at 346.
[367] "[R]eparation must, as far as possible, wipe out all the consequences of the illegal act and re-establish the situation which would, in all probability, have existed if that act had not been committed." See *Case Concerning the Factory at Chorzów (Germany v Poland)* (1928), PCIJ (Ser A) No 17 at 47 [hereinafter *Chorzów Factory case*].

Three possible criteria for establishing liability for damage under Article VII could apply. The first is a negligence-based liability, in which case the injured State would have the burden of proving the negligence of the launching State in order to receive compensation. The second, based on the *res ipsa loquitur* doctrine, implies a presumption of negligence on the launching State (rebuttable by this latter). The third is an absolute liability of the launching State. Under such theory, the damaged State shall simply prove the damage was caused by the launching State's space object.[368] Such theory, which seems the most adherent to the scope of the treaty, is based on the assumption of the ultrahazardous nature of the activity, the risk of which cannot be shifted onto the general public.

Dr. Ogunbanwo concludes that:

> In cases of collision between spacecrafts in outer space, or spacecraft and aircraft in airspace, the rules of liability will be as follows. If the accident is caused by one of the vehicles, then the fault is borne by the one that has caused the damage. If it is difficult to determine the degree of fault, the liability will be shared equally between the vehicles. In case of surface damage, the spacecraft bears absolute liability.[369]

It would be difficult to accept that, in the case of impossibility to determine the degree of fault in a collision between aircraft and a spacecraft, the liability must be shared. Indeed, in the case above, if one looks at the Liability Convention – which derogates Article VII of the OST, and which is a victim or claimant-oriented Convention based on the elaboration of Article VII of the OST[370] – the launching State of the spacecraft concerned will bear absolute liability.[371] In most accidents proof is hard to recover, and among the two activities, one is inherently ultrahazardous, while the other is considered a common transportation means. It is therefore in line with international law principles[372] and cases[373] to conclude that under Article VII of the OST such a hypothesis will place the burden of compensation fully onto the space object's launching State.

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[368] Ogunbanwo, *International Law and Outer Space, supra* note 359 at 143-144.
[369] *Ibid* at 144.
[370] Christol, "International Liability for Damage", *supra* note 358 at 351.
[371] Liability Convention, *supra* note 111, art. II.
[372] *See, for example*: *Vienna Convention on Civil Liability for Nuclear Damage*, 21 May 1963, Vienna (entered into force 12 November 1977).
[373] Kaplan citing the *Corfu Channel, Trail Smelter* and *Chorzow Factory cases*; see Steven G Kaplan, "Compensating Damage Arising from Global Nuclear Accidents: The Chernobyl Situation" (1988) 10 Loy L A Int'l & Comp L Rev 241 at 254-256.

It should, nevertheless, be noted that the inadequacy of Article VII has been recognized by the UN General Assembly through various resolutions.[374]

2.3.1 The Liability Convention

Although the Liability Convention elaborates on the principle of Article VII of the OST, it does not resolve the issue of whether the liability regime encompasses indirect damage.[375] According to Professor Foster, the word "caused" implies "the need for some causal connection between the accident and the damage", which excludes indirect damages.[376] Similarly, Dr. Kayser, taking into account Article 31.3(c) and Article 32 of the VCLT respectively, concluded that indirect damages are not normally recovered under general international law, and that since the Liability Convention's preparatory work shows no agreement on the issue, this would lead to the conclusion that indirect damages are not contemplated.[377] Professor Gorove considers the wording "caused by" a space object as exclusively referring to direct physical damage. He concludes that it could be "interpreted to mean that consequential damage where the damage does not flow directly and immediately from the act, but only from the consequences of such act, under normal circumstances would not be covered by the Convention".[378] Professor Christol considers Prof Gorove's position on the wording "caused by" as to mean that "there must be proximate causation between the damage and the activity from which the damage resulted"[379] and provides that:

> Article I of the convention straightforwardly enumerates four kinds of recoverable harm, namely, loss of life, personal injury, other impairment of health, and loss of or damage to property. These all fall within the actual, direct, general, foreseeable, or compensatory classification. Within the context of these concepts, a claimant would be required to show that

[374] For example, see *International cooperation in the peaceful uses of outer space*, GA Res 2733B (XXV), UNGAOR, 25th Sess, UN Doc A/8250 (1970).
[375] For a deeper analysis on the topic, see Elena Carpanelli and Brendan Cohen, "Interpreting "Damage Caused by Space Objects" under the 1972 Liability Convention" (2013) 56 Proc Int'l Inst Space L 29.
[376] W F Foster, "The Convention on International Liability for Damage Caused by Space Objects" (1972) 10 Can YB Int'l L 137 at 158.
[377] Kayser, *Launching Space Objects*, *supra* note 356 at 49.
[378] Stephen Gorove, "Cosmos 954: Issues of Law and Policy", (1978) 6 J Space L 137 at 141 [hereinafter Gorove, "Cosmos 954"].
[379] Christol, "International Liability for Damage", *supra* note 358 at 362. See also Gorove, "Cosmos 954" supra note 378 at 141.

> the harm flowed directly or immediately from, and as the probable or natural result of, the malfunctioning of the space object.[380]

Nevertheless, Christol concludes that despite the several opinions supporting the non-inclusion of indirect damages, "the convention will be interpreted as covering both direct and indirect damage resulting from […] a space object and its component parts".[381] The question nevertheless seems to remain open to debate, and it may potentially be used by some States to avoid their international liability or conversely to require higher insurance coverage. Uncertainty on this clearly hinders industry development as it cannot exactly foresee the potential damages arising from an accident and the necessary coverage needed.

None of the space law treaties provide for a liability cap; therefore, launching States are exposed to any amount that arises from the damage caused by a space object. This clearly reflects on the amount of financial guarantees required for the space undertakings. The Convention, nevertheless, differentiates between absolute and fault liability depending on the location of harm, respectively holding the launching State absolutely liable for damages caused by its space object on the ground and to aircraft on flight and fault-based liable for those caused to another space object (or person or property onboard) "elsewhere than on the surface of the earth".[382] Liability is subject, under Article VI, to exoneration where the claimant State has been grossly negligent.[383]

Of relevance to the liability regime for suborbital operations is the fact that no provision of the Liability Convention, however, considers people aboard the spacecraft, whose position is not clear. Further, the liability of the operator towards passengers and people aboard is not mentioned. Neither is it stated who should be liable for damages caused by persons and objects falling from the spacecraft, which are not, indeed, its component parts under Article I(d).[384] On this latter point, Professor Matte stated that "not only damage caused by the object itself, but also that caused by the payload, by the functioning of scientific instruments on board, and by *anything* that has become detached from or thrown out of the space object will be covered by the Convention".[385] However, Professor Cheng sustains that it is doubtful such damages are covered by the Convention, but if the escaped item is a

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[380] Christol, "International Liability for Damage", *supra* note 358 at 359.
[381] *Ibid* at 362.
[382] Liability Convention, *supra* note 111, arts II and III.
[383] *Ibid* art VI 1.
[384] *Ibid* art I(d).
[385] Nicolas M Matte, *Aerospace Law: From Scientific Exploration to Commercial Utilization* (Toronto: Carswell 1977) at 157 [emphasis added].

dangerous material, it may constitute a violation of the obligation under Article IX of the OST entitling the injured party to reparation under general international law.[386]

Clearly international space law presents serious regulatory uncertainties compared to the comprehensive liability regime of international air law.

3 Risk of overlap and inconsistency

In international aviation, there are trends toward open skies, and under the Chicago Convention, a Member State's system of certification and licenses that respect minimum ICAO standards shall be recognized by the others. Should, however, suborbital PTP transportation fall under international space law, every aspect of the activity must be regulated and previously agreed upon among all States in which the PTP service will operate. In a project such as that envisaged by Elon Musk at the IAC in Adelaide,[387] there must be an amount of State cooperation and agreement(s) so broad that it frankly seems impossible to realize within the current geopolitical scenario, international space law instruments, and national space legislation, which greatly varies among those countries that have a national space regime in place. Such a situation would particularly be worsened in cases where both regimes of air law and of space law apply because there will be substantial and inevitable inconsistency and overlap. Commercial aerospace flights will begin and are expected to grow exponentially in the next decade; however, they are users of the same airspace that is traversed by commercial aircraft which in the past 15 years have doubled in number and will foreseeably double again in the next 15.[388] There is a need for defined and comprehensive rules of safety, security, liability, and traffic management that are uniformly applicable for the users of the same medium. [389]

As this thesis investigates below, if it is possible to extend the ICAO regime to such operations, it could provide the basis for a more realistic perspective of suborbital PTP operations by, above all, streamlining safety standards and making navigation rules uniformly applicable. Further, bringing the regulation of suborbital aerospace operations under ICAO competence will justifiably extend the comprehensive carrier liability regime to such bourgeoning commercial operations.

As more than a State may be internationally responsible and liable for the activities of a space object, especially in the case of non-governmental objects, it is in the interest of all States involved to

[386] Cheng, *Studies in International Space Law, supra* note 85 at 637.
[387] Shepherd & Seidel, "Elon Musk", supra note 11.
[388] ICAO, Global Air Navigation Plan 2016-2030, ICAO Doc. 9750_5ed at 7.
[389] Dempsey, *Public International Air Law, supra* note 18 at 935.

supervise the activities providing, through specific regulations, for requirements, obligations, and restrictions so as to prevent liability and fulfil their responsibility obligations. In the situation of more States involved, there needs to be a choice of which of them registers the object and whose State's laws and jurisdiction shall apply to it. Nevertheless, any such agreement does not affect the rights of third States towards which all the involved States would be jointly and severally responsible and liable.[390] In practice, it is clear that a spacefaring State's main reason for regulating the safety of suborbital activities strictly rests on minimizing exposure to liability. Such an approach is harmful for the safe and sustainable development of a point-to-point suborbital industry that aims to function and mature to the level of commercial aviation we see today. Indeed, the current structure of international space law disincentivizes the development of such transportation means since the burden on States is too high.

Faced with deficiencies in the international space law regime, Professor Cheng suggests that national laws necessarily shall further extend to space activities in order to properly regulate the conduct of these entities.[391] Indeed, as municipal law has no extraterritorial applications, and considering the lack of a comprehensive legal regime of global space governance backed by a centralized international institution, any national move in this sense, as seen below, will bring the risk of fragmentation of space law among nations, with different standards, interpretation of international obligations, etc. As there is a need to ensure that suborbital PTP activities take place according to clear and uniform standards even when they are in international airspace or in outer space, States should aim for uniformity of laws to govern space activities, as is the case in aviation law. So long as there is a lack of an international bottom-up regime centered around an intergovernmental and regulatory framework such as the Chicago Convention system and ICAO, it would be difficult to see any concrete development of suborbital PTP operations as a common means of transportation.

4 Principles of general international law

Should it be determined that international suborbital PTP operations (or a portion thereof) fall neither under the air nor space law regime, general international law would still apply and could render accountable States having a "genuine connection"[392] with the person whose space object's activity has caused damage.

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[390] Cheng, *Studies in International Space Law, supra* note 85 at 638.
[391] *Ibid* at 640.
[392] *Nottebohm Case (Liechtenstein v. Guatemala) second phase*, [1955] ICJ Rep 4 at 23.

4.1 International obligations upon the States

After the Second World War, international law evolution from a regime based on limiting State sovereignty to one that prescribes, and even imposes, duties on States has increased.[393] States are indeed subjects to a series of obligations whose origins may derive from international conventions, international custom, general principles of law,[394] or from other bases such as an unilateral act or declaration of a State.[395]

The breach of any such obligation, the determination of which requires the analysis of the content of the obligation involved in each specific case, gives rise to international responsibility of the wrongdoer State for an "internationally wrongful act" towards another State or group of; a widely recognized principle,[396] which the ILC has codified in Article 1 of its Articles on State Responsibility (ASR).[397] In the *Rainbow Warrior* arbitration, the tribunal recognized that "any violation by a State of any obligation, *of whatever origin*, gives rise to State responsibility and consequently, to the duty of reparation".[398] Similarly, in the *Gabčíkovo-Nagymaros Project case,* the ICJ stated that it is "well established that, when a State has committed an internationally wrongful act, its international responsibility is likely to be involved *whatever the nature of the obligation* it has failed to respect".[399] About the nature of the obligation, Article 12 ILC ASR provides that:

> There is a breach of an international obligation by a State when an act of that State is not in conformity with what is required of it by that obligation, regardless of its origin or character.[400]

Article 2 provides that an act of a State is internationally wrongful when its conduct, consisting of an action or omission

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[393] *See:* Bruno Simma, "Bilateralism and Community Interest in the Law of State Responsibility" in *State Responsibility in International Law* (Florence: Taylor and Francis, 2002).
[394] ICJ Statute, *supra* note 43, art 38.
[395] *Nuclear Tests (Australia v France)*, [1974] ICJ Rep 253 at 268.
[396] The close link between the breach of an international obligation and its immediate legal consequence in the obligation of reparation was recognized in article 36, paragraph 2, of the PCIJ Statute, which was carried over without change as Article 36, paragraph 2, of the ICJ Statute. See: D Anzilotti, *Corso di diritto internazionale*, 4th ed vol I (Padua: CEDAM, 1955) at 385.
[397] ILC, Articles on State Responsibility, *supra* note 298, art 1.
[398] *Case concerning the difference between New Zealand and France concerning the interpretation or application of two agreements concluded on 9 July 1986 between the two States and which related to the problems arising from the Rainbow Warrior affair* (1990), UNRIAA Vol XX 215 at 251 para 75.
[399] *Gabčíkovo-Nagymaros Project* [1997] ICJ Rep 7 at 38 para 47 [emphasis added].
[400] ILC, Articles on State Responsibility, *supra* note 298, art 12.

(a) is attributable to the State under international law; and

(b) constitutes a breach of an international obligation of the State.[401]

Therefore, the two criteria to identify a wrongful act are that of objective fault and of attributability. The former, also identified as "objective responsibility", renders the elements of subjective fault or *culpa* and the element of damage unnecessary. In other words, what is relevant for responsibility to arise is the mere attribution of the objective breach of an international obligation.[402] The general rule of attributability is that a State is responsible for "acts of the State", which are those involving a degree of authority through State organs or delegations. A corollary of this rule is that a State cannot be held responsible as such for acts of private persons done in a private capacity.[403] Nevertheless, it is possible that a State may be held responsible for acts of private individuals within its territory, jurisdiction, or control if the State had, and breached, an international duty regarding such activities, such as a duty to prevent the acts in questions or a due diligence duty in regulating and overseeing them in order to avoid that rights of other States are infringed.[404]

Because the characterization of an act as internationally wrongful derives from international law, any internal law that may legitimize such an act is irrelevant on the international stage.[405] As Sir Arnold McNair provided in its dissenting opinion to the Fisheries Case judgement:

> a State can never plead a provision of, or lack of a provision in, its internal law or an act or omission of its executive power as a defence to a charge that it has violated international law.[406]

Therefore, a breach of an international obligation which gives rise to international State responsibility consists in the disconformity between the conduct of the State required by an international obligation,

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[401] *Ibid*, art. 2.
[402] Frans G von der Dunk, "Liability versus Responsibility in Space Law: Misconception or Misconstruction?" (1991) 34 Proc on L Outer Space 363 at 363 [hereinafter von der Dunk "Liability versus Responsibility"].
[403] In the *German Settlers in Poland Adv Op* the PCIJ provided that "States can act only by and through their agents and representatives", consequently, the attribution of an act or omission shall be based on the conduct of these latter. See *German Settlers in Poland* (1923), Advisory Opinion, PCIJ (Ser B) No 6 at 22.
[404] *United States Diplomatic and Consular Staff in Tehran (United States v Iran),* [1980] ICJ Rep 3 at paras 61-68 [hereinafter *US Diplomatic and Consular Staff in Teheran*].
[405] ILC, Articles on State Responsibility, *supra* note 298, arts 3, 32. See also VCLT *supra* note 144, art 27.
[406] *Fisheries Case (United Kingdom v Norway)*, (Dissenting Opinion of Sir Arnold McNair) [1951] ICJ Rep 116 at 181.

whatever its source is, and the conduct actually adopted by the State.[407] Essentially, there should be "incompatibility with the obligations"[408] of a State and its acts or omission[409] which are "contrary to" or "inconsistent with" the given rule.[410] Any such breach, as seen below, will imply a duty of reparation.

4.2 Attributability

When attributing responsibility to a State, the general rule is that the conduct attributable to the State is only that of organs which exercise any of the State's function[411] or of entities that have the capacity to exercise the elements of State authorities.[412] Similarly, if a State places at the disposal of another its organs, for example, because of an agreement to supervise point to point suborbital activities, "[t]he conduct of the organ placed at the disposal […] shall be considered an act of the former State under international law if the organ is acting in the exercise of elements of the governmental authority of the State at whose disposal it is placed."[413] Under Article 8 of ILC ASR, the conduct of a private entity may be attributed to a State if the entity acts under the direction, instructions, or control of the State.[414] In the *Tadic´case*, the Appeals Chamber of the International Tribunal for the Former Yugoslavia provided:

> The requirement of international law for the attribution to States of acts performed by private individuals is that the State exercises control over the individuals. The degree of control may, however, vary according to the factual circumstances of each case. The Appeals Chamber fails to see why in each and every circumstance international law should require a high threshold for the test of control.[415]

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[407] ILC, *Commentaries to the Draft Articles on Responsibility of States for Internationally Wrongful Acts*, UNGAOR, UN Doc A/56/10/chp IV/Sup No10 (2001) at 54 [hereinafter ILC, *Commentaries to the Draft Articles on State Responsibility*].
[408] *US Diplomatic and Consular Staff in Teheran*, *supra* note 404, at 29 para 56.
[409] For example, in the *Corfu Channel case*, the inaction of Albania in the face of something that it knew or should have known was sufficient to attribute responsibility. See *Corfu Channel case (United Kindom v Albania)*, [1949] ICJ Rep 4 at 22–23 [hereinafter Corfu Channel case].
[410] *Military and Paramilitary Activities in and against Nicaragua, supra* note 188 at 64 para 115 and at 98 para 186.
[411] ILC, Articles on State Responsibility, *supra* note 298, art 4.
[412] *Ibid*, art 5.
[413] *Ibid*, art 6.
[414] *Ibid*, art 8.
[415] *Prosecutor v Duško Tadic´*, IT-94-1-A, Appeal Chamber Judgement (15 July 1999) at 48 para 117 (International Criminal Tribunal for the Former Yugoslavia, Appeals Chamber).

Therefore, the conduct of private individuals may be attributed to a State when it is undertaking a (even minimal) form control.

4.3 Due Diligence

Notwithstanding the above, one should note that even if the conduct of an individual is *per se* not attributable to the State having jurisdiction, this latter may still be held responsible for the damages arising out of such conduct should they be the consequence of a breach, attributable to the State, of a duty of due diligence over such activities.

The Trail Smelter Arbitration and its progeny codified the principle under which every State is under the customary international law obligation to prevent abnormally dangerous activities within its territory from causing damage outside its territory. This obligation also applies when these activities are conducted by private individuals.[416]

The Arbitration Tribunal provided that:

> under principles of international law […] no State has the right to use or permit the use of its territory in such manner as to cause injury […] in or to the territory of another or the properties or persons therein[.][417]

The Trail Smelter principle of due diligence (and prevention) has been reaffirmed by other cases, particularly in the Corfu Channel case which also established the *knew or should have known* international legal standard for liability.[418] The ICJ recognizes

> every State's obligation not to allow knowingly its territory to be used for acts contrary to the rights of other States.[419]

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[416] Lucas Bergkamp, *Liability and the Environment: private and public law aspects of civil liability for environmental harm in an international context*, (Hague, London and New York: Kluwer Law International, 2001) at 160 [*hereinafter* Bergkamp, *Liability and the Environment*].
[417] *Trail smelter case (United States v Canada)* (1941), UNRIAA Vol III 1905 at 1965 [hereinafter *Trail Smelter case*].
[418] *Corfu Channel case*, *supra* note 409 at 18.
[419] *Ibid* at 22.

Therefore, a State which authorizes a private suborbital activity to take place from its territory may be held responsible if it failed to take the necessary measures to prevent harmful effects of such activity to other States.[420] This is especially true with reference to ultra-hazardous activities, such as commercial international suborbital PTP operations, which would put the State under a general due diligence obligation, the breach of which exposes it to the duty of reparation for the damage caused.[421]

Due diligence implies the obligation to prevent harm. Such an obligation has a continuing character and concretely is fulfilled by the State through the creation and implementation of policies, legislation, regulations, and enforcement measures, in order to discipline a determinate activity within its territory or under its jurisdiction or control.[422] The duty to implement also implies establishing a continuing monitoring of the activity[423] it has authorized, especially if this could result in transnational danger.

To prevent a private suborbital activity taking place from its territory from causing serious damage outside, a State must enact with due diligence those laws and administrative procedures which a "good government" is expected to enact,[424] including, indeed, a regime of authorization and control of the activity. A State shall therefore authorize a commercial PTP suborbital activity before it can take place. Any decision with respect to the authorization of such operations shall be based on the assessment of risk.[425] Prior to authorizing an international PTP operation departing from or arriving to its territories, States may need to notify, inform[426], and eventually consult[427] other States that may potentially be at risk. Further, continuous monitoring of the operation is necessary to ensure that if it fails to conform to the terms of the authorization, the State will take such actions as appropriate, including terminating the authorization to avoid that other States' interests may be affected.[428] The standard of due diligence essentially depends on the nature of the activity.[429] Therefore, if a State will not properly authorize and

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[420] *Ibid*; See also *US Diplomatic and Consular Staff in Teheran, supra* note 404 at paras 56, 90. Iran was therefore responsible on two counts, (1) for adopting the act of its individuals as its own; and (2) *for failing to prevent acts that would injure rights of other States*.
[421] Bergkamp, *Liability and the Environment*, *supra* note 416 at 158.
[422] ILC, *Prevention of Transboundary Harm from Hazardous Activities with commentaries*, UNGAOR, UN Doc A/56/10/chp V/Sup No10 (2001) at 154 (10) [hereinafter ILC, *Prevention of Transboundary Harm with commentaries*]; Such duty of prevention is codified in Articles 2(d) and 3 of the Articles on the Prevention of Transboundary Harm from Hazardous Activities, See ILC, *Prevention of Transboundary Harm from Hazardous Activities* UNGAOR, UN Doc A/56/10/ Sup No10 (2001), arts 2(d), 3 [hereinafter ILC, *Articles on Prevention of Transboundary Harm*].
[423] ILC, *Articles on Prevention of Transboundary Harm, supra* note 422, art 5.
[424] Bergkamp, *Liability and the environment, supra* note 416, at 164-165.
[425] ILC, *Articles on Prevention of Transboundary Harm, supra* note 422, art 7.
[426] *Ibid*, art 8.
[427] *Ibid*, art 9.
[428] *Ibid*, art 6.
[429] ILC, *Prevention of Transboundary Harm with commentaries*, supra note 422 at 154 (11).

supervise the suborbital activity in question, it may be held liable for the damage created by the activity *vis-à-vis* other States, their persons and properties.

One may argue whether actions that go beyond the scope of the authorization still implicate the State responsibility of the authorizing State. Generally, a State does not assume the risk that instructions are carried out in an unlawful way. Nevertheless, even if a particular instruction is ignored, the conduct still remains attributable to the State if it has or should have had a degree of control over the entity or the activity.[430]

4.4 Legal consequences of an internationally wrongful act

The State's failure to respect its due diligence duty over suborbital PTP operations taking place from its territory or otherwise under its jurisdiction and control would imply serious legal consequences. In the Spanish Zone of Morocco Claims the Court held:

> [r]esponsibility is the necessary corollary of a right. All rights of an international character involve international responsibility. If the obligation in question is not met, responsibility entails the duty to make reparation.[431]

In the Chorzów Factory case the PCIJ provided that "the breach of an engagement involves an obligation to make reparation in an adequate form",[432] which should also be accompanied by the immediate cessation of the wrongful conduct.[433] Under customary international law, reparation for a wrongful act can be fulfilled in three ways:

a) *Restitutio in Integrum*: which imposes a duty to fully restore the preexisting situation if it not materially impossible.[434]
b) Compensation: which applies if the damage is irreparable. It is usually performed in monetary form to substitute for an equal value and includes the loss of profits.[435]

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[430] ILC, *Commentaries to the Draft Articles on State Responsibility*, *supra* note 407 at 48 para (8).
[431] *Affaire des biens britanniques au Maroc espagnol (Espagne contre Royaume-Uni)* (1925) UNRIAA, Vol II 615 at 641 [translated by author].
[432] *Case Concerning the Factory at Chorzów (Germany v Poland)* (1927), PCIJ (Ser A) No 9 at 21.
[433] ILC, Articles on State Responsibility, *supra* note 298, art 30 (a).
[434] *Ibid*, art 35.
[435] *Ibid*, art 36.

c) Satisfaction: In case an obligation has been breached but damage has not occurred, the State is obliged to acknowledge the breach and, when necessary, to officially apologise.[436]

In any event, the breach of an international obligation having continuous character such a duty of due diligence of the concerned State over a PTP suborbital activity extends over the entire period the State does not conform with the obligation[437] and does not affect the continued duty to perform it.[438]

4.5 Liability for lawful acts

A corollary of the due diligence obligation is the principle for which, should a State act carefully and take all necessary measures required by the obligation, no breach has been committed and therefore, no liability would attach. Nevertheless, because of the ultra-hazardous nature of suborbital PTP activities, a question arises as to whether a State may still be held liable for a damage caused by an ultra-hazardous activity of a private entity which it has authorized, even if all the obligations of the case have been met.

An ultrahazardous activity may be defined as "an activity or process that presents an unavoidable risk of serious harm to the other people or others' property, for which the actor may be held strictly liable for the harm, even if the actor has exercised reasonable care to prevent that harm".[439]

Recent attempts of codification, especially in the field of international environmental law,[440] have analyzed the issue of liability of States for lawful acts.[441] Differently than with responsibility where damage is not an essential element for it to arise, in international liability, the damage is an indispensable factor. Of course, an internationally wrongful act usually leads to damage which is often a notable element in cases of international responsibility for a wrongful act. Such potential overlap may create confusion.

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[436] *Ibid*, art 37. See also von der Dunk "Liability versus Responsibility"*, supra* note 402 at 364.
[437] ILC, Articles on State Responsibility, *supra* note 298, art 14 (2).
[438] *Ibid*, art 29.
[439] "Ultrahazardous Activity", *Cornell Law School Legal Information Institute*, online: < https://www.law.cornell.edu/wex/ultrahazardous_activity >. See also the Restatement (Second) of Torts, § 520.
[440] Quentin-Baxter, "Preliminary Report on International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law." UN Doc. A/CN.4/334, YILC, 1980, Vol. II, Part 1, pp. 247-266.
[441] Since 1978, the International Law Commission (ILC) has been studying the topic as "International Liability for Injurious Consequences Arising Out of Acts Not Prohibited by International Law". See ILC Report of the International Law Commission on the Work of Its Thirtieth Session. YILC, 1978, Vol. II, Part 2, p. 149.

In an attempt to distinguish international responsibility from liability, the ILC has codified the concept of State liability as only applicable to damage arising out of acts that are not in violation of international law, excluding (or attempting to) overlap with international responsibility which on the contrary requires the element of breach or objective fault.[442] Therefore, international liability for lawful acts would not require a prior breach of any international obligation to hold a State internationally liable, but rather it would be triggered by the harm produced by an activity which, per se, is not contrary to international law.[443] Further, differently than State responsibility, which can be redeemed in the three different ways seen above, international liability could be redeemed only through repairing the damage.[444]

The principle of State liability for lawful acts finds its roots in the Trail Smelter Arbitration[445] and its progeny, from which it is possible to conclude that it would also extend to cases where a State authorizes an ultra-hazardous activity of a private entity planned or carried out in or from its territory, or otherwise under its jurisdiction or control,[446] which creates damage outside, even if no obligation related to the activity has been breached by the authorizing State. The example relevant for this thesis is a duly authorized and supervised international commercial suborbital PTP operation which causes damage to another State or to international aviation.

The concept of liability for lawful acts, and the ILC project itself, has received much criticism[447] as well as support.[448] Deepening the analysis of this controversy, although interesting, is beyond the scope of this thesis. Nevertheless, what is relevant for the present discussion is that States could be held liable for damages outside their territories arising out of private suborbital activities planned or carried out in or from their territory, or otherwise under their jurisdiction or control – even if no international duty of due care or whatsoever nature tied to the activity has been breached.

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[442] von der Dunk "Liability versus Responsibility", *supra* note 402, 364.
[443] For example, art 3 of the ILC Articles on Prevention of Transboundary Harm from Hazardous Activities provides that "[t]he State of origin shall take all appropriate measures to prevent significant transboundary harm or at any event to minimize the risk thereof". See ILC, *Prevention of Transboundary Harm from Hazardous Activities*, *supra* note 422, art 3. In the case a damage occurs, principle 4 of the Draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities provides that "[e]ach State should take all necessary measures to ensure that prompt and adequate compensation is available for victims of transboundary damage caused by hazardous activities located within its territory or otherwise under its jurisdiction or control". See ILC, Draft principles on the allocation of loss in the case of transboundary harm arising out of hazardous activities, UNGAOR, UN Doc A/61/10 (2006), art 4.
[444] von der Dunk "Liability versus Responsibility", *supra* note 402 at 364.
[445] *Trail Smelter case*, *supra* note 417.
[446] ILC, *Prevention of Transboundary Harm from Hazardous Activities*, supra note 422, art 2 (d).
[447] For example, see Boyle AE. "State Responsibility and International Liability for Injurious Consequences of Acts not Prohibited by International Law: A Necessary Distinction?" 39 International and Comparative Law Quarterly (ICLQ) 1990 at 1-26; See also Christine D Gray, *Judicial Remedies in International Law*, (Oxford: Clarendon, 1987) at 233.
[448] See for example: Rebecca M Bratspies and Russell A Miller (eds), *Transboundary Harm in International Law - Lessons from the Trail Smelter Arbitration* (Cambridge: Cambridge University Press, 2006).

Conclusion

The above paragraphs have briefly outlined how States are exposed to international responsibility and potential liability that may arise from the commercial international PTP suborbital operations taking place from their territories and/or by entities under their jurisdiction or control. Such potential exposure and uncertainty provide further ground for States to seriously look at regulating these activities within a specific and clear legal framework, including the potential extension of the private international air law instrument or the creation of new ones *ad hoc*.

Chapter IV
National Approaches

The hybrid aerospace nature of suborbital operations, the lack of legal definition of and delimitation between air and space and, mostly, the lack of a comprehensive international regime governing such activities have given States broad opportunities to interpret and choose which national regulatory regime shall apply. This chapter explores major emerging regulatory approaches and whether they are leading to fragmentation among national or regional space regimes.

1 United States

The US Congress has granted to the Office of Commercial Space Transportation of the Federal Aviation Administration (FAA/AST), within the Department of Transportation (DOT), authority to regulate and license private human spaceflights.[449] Licensing in lieu of certification has been preferred as a "soft" mode of authorization to allow operators to experiment without imposing an overly

[449] 51 USC § 50901(b)(3); see also *Office of Commercial Space Transportation*, Federal Aviation Administration, online: < http://ast.faa.gov/ lrra/about_lrra.htm >. In the CSLA as amended, Congress mandated the DOT to issue regulations to carry out the Act. See: 51 USC § 50922(c). The FAA is responsible for regulating and licensing the launch and re-entry of commercial space vehicles as well as the operation of private launch and re-entry sites within the US territory. See *Office of Commercial Space Transportation*, Federal Aviation Administration, online: < http://ast.faa.gov/ lrra/about_lrra.htm >. See also 14 CFR §§ 400 to 460.

burdensome regulatory regime while guaranteeing the safety of the public and property not involved in the operations.[450]

Since Scaled Composites was licensed to conduct Reusable Launch Vehicle (RLV) missions in 2004, it seems that the US regime frames and treats these types of launches as space launches.[451] Consequently, the object of such a launch would be a space object. However, the US choice of law appears to prioritize and "cherry-pick" only certain aspects of both space and air law to regulate such operations, which seems the result of economic concerns about the development of this industry.[452] This choice is, indeed, reflected in Title 51 U.S.C. Chapter 509, formerly the Commercial Space Launch Act of 1984, as amended,[453] which is a *sui generis* legal regime applicable to private spaceflights.[454]

1.1 The US Commercial Space Launch Act and amendments thereto

Under the Act, launch "means to place or try to place a launch vehicle or reentry vehicle and any payload or human being from Earth - (A) in a suborbital trajectory; (B) in Earth orbit in outer space; or (C) otherwise in outer space"[455]. Suborbital vehicles fall under the definition of "launch vehicles", intended as:

> (A) a vehicle built to operate in, or place a payload or human beings in, outer space; and
>
> (B) a suborbital rocket.[456]

"Suborbital rocket" is defined as "a vehicle, rocket-propelled in whole or in part, intended for flight on a suborbital trajectory, and the thrust of which is greater than its lift for the majority of the rocket-powered portion of its ascent."[457] Such a definition distinguishes between the characteristic of an

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[450] Rep Sherwood Boehlert, in a letter to his colleagues inviting to vote yes to the bill H.R. 5382, stated: "This bill concerns the commercial space flight industry, an industry that is now of interest only to entrepreneurs and daredevils and should not be regulated as if it were a commercial airline acting as common carrier" see "Dear Colleague Letter From Rep. Sherwood Boehlert Regarding H.R. 5382, the Commercial Space Launch Amendments Act", *Spaceref* (19 November 2004), online: <http://www.spaceref.com/news/viewsr.html?pid=14558>.

[451] 'Commercial Space Transportation: 2004 Year in Review', FAA/AST (January 2005), online: < http://ast.faa.gov >.

[452] Frans G von der Dunk, "Space Tourism, Private Spaceflight and the Law: Key Aspects" (2011) 27: Space Policy J 146 at 149 [hereinafter von der Dunk, "Space Tourism"].

[453] Commercial Space Launch Act, Pub. L. No. 98-575, 98 Stat. 3055 (1984); Commercial Space Launch Act section 3, 98 Stat. 3055-56, Commercial Space Launch Act Amendments of 1988, Pub. L. No. 100-657, 102 Stat. 3900; Commercial Space Launch Amendments Act of 2004, Pub. L. No. 108- 492, 118 Stat. 3900 (codified as Title 51 US Code Chapter 509), Commercial Space Launch Competitiveness Act, Pub. L. No: 114-90, 129 Stat. 704, of 11/25/2015.

[454] Rafael Moro-Aguilar, "National Regulation of Private Suborbital Flights: A Fresh View" (2015) 10: FIU L Rev 679 at 679 [*hereinafter* Moro-Aguilar, "National Regulation"].

[455] 51 USC § 50902 (7).

[456] *Ibid,* § 50902 (11).

[457] *Ibid,* § 50902 (22);

aircraft - “lift”- and that of a rocket - “thrust” - as the means of their propulsion and completing their intended function.[458] "Suborbital trajectory" is intended as “the intentional flight path of a launch vehicle, reentry vehicle, or any portion thereof, whose vacuum instantaneous impact point does not leave the surface of the Earth”.[459]

Nevertheless, "reentry vehicle" means “a vehicle designed to return from *Earth orbit or outer space to Earth,* or a reusable launch vehicle designed to return from Earth orbit or outer space to Earth, substantially intact.”[460] Further, "reenter" and "reentry" are defined as “to return or attempt to return […] a reentry vehicle […] from Earth orbit or from outer space to Earth”.[461] The definitions of “reentry” and of “reentry vehicle” seem to exclude *suborbital trajectories*. In this sense, as Stotler points out, it appears that the Act does not consider suborbital vehicles as “reentry vehicles” but only as “launch vehicles” falling under the category of “suborbital rocket”.[462] Therefore, the non-classification of suborbital vehicles as “reentry vehicles” during their return implicitly means that they do not enter - nor consequently reenter from - outer space. In this sense, the OST would be inapplicable to them.[463]

1.2 A space object?

The US has never registered any suborbital vehicle according to the RC because they are not launched into Earth orbit and beyond. Nevertheless, the US has – so far – not registered any suborbital vehicle in its National Register of Objects Launched into Outer Space according to Article VIII of the OST. As early as 17 December 2003, SpaceShipOne flew for the first time, but no registration appears on that date or subsequently.[464] Article VIII of the OST provides that “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 […]”.[465] Unless the provision of the RC intends to modify the term “outer space” of Article VIII of the OST, the lack of registration of such vehicles in the US national registry may either imply that they US does not consider the vehicle has reached outer space, and therefore that the 100 km

[458] Moro-Aguilar, “National Regulation”, *supra* note 454 at 686.
[459] 51 USC § 50902 (23).
[460] *Ibid,* § 50902 (19) [*emphasis added*].
[461] *Ibid,* § 50902 (16) [*emphasis added*].
[462] Charles W Stotler, *Air and Space Law in the Context of Globalization and Fragmentation*, thesis (Montreal: McGill University Faculty of Law, Institute of Air and Space Law, 2015) at 91 [hereinafter Stotler, *Air and Space Law*].
[463] *Ibid*.
[464] US Department of State, *Registry of Object Launched in Outer Space*, online: <https://usspaceobjectsregistry.state.gov/pages/home.aspx>.
[465] Outer Space treaty, *supra* note 101, art VIII (emphasis added).

altitude in not considered as such, or that such vehicles are not space objects (or both).[466] Considering the above, it appears that the US excludes the applicability of international space law to suborbital vehicles.

1.3 An aircraft?

In the US, suborbital vehicles are partially treated as aircraft; indeed, as under Article 20 of the Chicago Convention,[467] an "N" series tail identification number has been provided, for example, to SpaceShipTwo.[468] Nevertheless, differently from air law, where aircraft are issued a certification,[469] under the Act, a suborbital vehicle could operate either under a license[470] or under an experimental permit[471] issued by the FAA. In this sense, it appears that the OST is applicable to suborbital crafts. If not, then their classification would be similar to that of sounding rockets as in Sweden, where they are not considered space objects.[472]

1.4 Safety aspects of the US regime

Safety drives industry. A faulty design may lead to a catastrophe which could put in jeopardy the entire suborbital commercial sector.[473]

Although the US regime disciplining suborbital operations is the most comprehensively developed, it seems built to strike the balance between safety of passengers and industry promotion by providing very basic regulations.[474] In fact, since 2004, a safety moratorium (or "learning period") prevents FAA from implementing regulations on the spacecraft design and operations and excludes their certification.

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[466] Stotler, *Air and Space Law*, *supra* note 462 at 91-92.
[467] Chicago Convention, *supra* note 65, art 20.
[468] *Ibid* at 92.
[469] For example, article 31 of the Chicago Convention provides that "[e]very aircraft engaged in international navigation shall be provided with a certificate of airworthiness issued or rendered valid by the State in which it is registered." See Chicago Convention, *supra* note 65, art 31.
[470] 51 USC § 50904.
[471] *Ibid*, § 50906.
[472] According to section 1 of the Swedish Act on Space Activities, the launch of sounding rockets does not constitute a space activity, see Sweden, *Act on Space Activities* (18 November 1982), n 1982/963, section 1. See also Stotler, *Air and Space Law*, *supra* note 462 at 92-93.
[473] Tommaso Sgobba et al*., Space Safety and Human Performance,* 1st ed (Elsevier, 2018) at 334 [hereinafter Sgobba et al., *Space Safety*].
[474] Jürgen Cloppenburg, "Legal Aspects of Space Tourism" in Marietta Benkö & Kai-Uwe Schrögl, eds, *Space Law: Current Problems and Perspectives for Future Regulation* (Utrecht: Eleven international publishing, 2005) 191 at 212.

The moratorium eases the licensing requirements for this nascent industry, and it will extend until the fiscal year 2023.[475]

A FAA/AST launch license focuses on public health and safety, safety of property, national security interests, and foreign policy interests of the United States, and is required for the operator of suborbital vehicles to launch from the US or for a US citizen launching from abroad.[476] However, for air-launches such as Virgin Galactic's, the suborbital-craft (SpaceShipTwo) is licensed as a launch vehicle, while its mothership (WhiteKnightTwo) would operate under an aircraft certificate.

Under the Act, a "space flight participant" is defined as "an individual, who is not crew or a government astronaut, carried within a launch vehicle or reentry vehicle."[477] The participant shall be informed by the operator – and provide its consent – on the risk of participating in a suborbital operation and on the lack of US Government certification of the vehicle as safe for carrying crew or space flight participants.[478] Further, each participant is required to waive any claims against the US Government.[479]

The Act also provides for an "experimental permit", which is issued within 120 days, "only for reusable suborbital rockets or reusable launch vehicles that will be launched into a suborbital trajectory or reentered" for limited purposes such as research, testing, crew training.[480] Under the permit, indeed, carriage of property or humans for compensation or hire is not allowed.[481]

One question which arises is whether such a "learning period" is necessary. Should these vehicles really need to be designed and operated from scratch? Should one discount half a century of government know-how?[482] One author commented that:

> Safety requirements, organizational models, and lessons learned from government programs need to be adapted to new realities or there will be the risk of going back to the beginning of

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[475] US, Federal Aviation Administration Oversight of Commercial Space Transportation: *Hearing Before the Subcommittee on Aviation of the Committee on Transportation and Infrastructure House of Representatives*, 114th Cong, 2nd Sess (Washington, DC: United States Government Publishing Office, June 22, 2016) at 2-3 [hereinafter FAA Oversight of Commercial Space Transportation, Hearings 114th Cong].
[476] 51 USC § 50904.
[477] *Ibid*, § 50902 (20).
[478] 14 CFR § 460.45.
[479] *Ibid*, § 460.49 and 14 CFR § 440.17. See also 14 CFR Appendix E to Part 440.
[480] 51 USC § 50906 (d)
[481] *Ibid*, § 50906 (h)
[482] Ermanno F Napolitano, "The Leading Role Australia Could Play in Fostering Uniformity of National Space Legislations among the Asia-Pacific Countries" in P J Blount et al. eds, *Proceedings of the International Institute of Space Law* (The Hague: Eleven International Publishing, 2017) 477 at 494. [hereinafter Napolitano, "The Leading Role"].

> the learning curve. […] [A]n ominous accident during flight testing, attributed to single-human error, seem to point in such direction.[483]

Has the industry derived any benefit from this "learning period"? Although overregulation could be burdensome for the development of a nascent industry[484] one should question whether the choice of not regulating safety beyond protection of that of the public and its properties is the right path.[485] According to Professor Leveson:

> 70% to 90% of the design decisions that affect safety are made in concept development, requirements definition, and architectural design. The degree to which it is economically feasible to eliminate or minimize a hazard rather than to control it depends on the stage in system development at which the hazard is identified and considered. […] [A] more expensive and less effective alternative is to design first, identify the hazards, and then add on protective equipment to control the hazards when they occur. [486]

1.5 NTSB accident investigation

On 31 October 2014, SpaceShipTwo (SS2) a Scaled Composites LLC vehicle operating under an FAA/AST experimental permit broke up into multiple pieces while on a test flight.[487] The US National Transportation Safety Board (NTSB)'s investigation established that " the probable cause of this accident was Scaled Composites' failure to consider and protect against the possibility that a single human error could result in a catastrophic hazard to the SpaceShipTwo vehicle".[488] The investigation led to the discovery of safety deficiencies involving both Scaled Composite and the FAA/AST system:

- Lack of human factors guidance for commercial space operators;

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[483] Sgobba et al., *Space Safety*, *supra* note 473 at 276.
[484] FAA Oversight of Commercial Space Transportation, Hearings 114th Cong, *supra* note 475 at 10.
[485] Napolitano, "The leading Role", supra note 482 at 494.
[486] Sgobba et al., *Space Safety*, *supra* note 473 at 278. See also Napolitano, "The Leading Role", supra note 482 at 494-495.
[487] US, National Transportation Safety Board, *Aerospace Accident Report - In-Flight Breakup During Test Flight Scaled Composites SpaceShipTwo, N339SS Near Koehn Dry Lake, California October 31, 2014* (NTSB/AAR-15/02 PB2015-105454) (Washington DC: US Government Printing Office, 2015) at vi, online: <https://www.ntsb.gov/investigations/AccidentReports/Reports/AAR1502.pdf>.
[488] *Ibid* at ix.

- Efficacy and timing of the preapplication consultation process;
- Limited interactions between the FAA/AST and applicants during the experimental permit evaluation process;
- Missed opportunities during the FAA/AST's evaluations of hazard analyses and waivers from regulatory requirements;
- Limited inspector familiarity with commercial space operators;
- Incomplete commercial space flight database for mishap lessons learned;
- Need for improved emergency response planning.[489]

Among its concluding points, the NTSB report directs the FAA/AST to "provide clearer guidance on evaluating commercial space transportation permits, waivers, and licenses, and […] [to] better define the line between the information needed to ensure public safety and the information pertaining more broadly to ensuring mission success."[490]

It appears inconceivable that the current US regulatory regime and approach to suborbital operations could foster the development of PTP international suborbital transportation.[491] Although far from certification like in aviation, in a further step towards more efficient regulations, the FAA could streamline all regulations about launch and reentry and shift towards a performance-based regulatory approach to suborbital operations.[492]

2 European Union

The EU has not yet regulated the operations of suborbital vehicles at a Union level,[493] though recent events indicate the willingness of certain EU States to regulate suborbital operations at their national level.[494] Notwithstanding this, it is, nevertheless, expected that the EU would take a collective

[489] *Ibid* at vii to ix.
[490] *Ibid* at 71
[491] Napolitano, "The Leading Role", supra note 482 at 496.
[492] See US, President, *Space Policy Directive-2, Streamlining Regulations on Commercial Use of Space* (Washington DC: US Government Printing Office, May 24, 2018) at Sec 1 and Sec 2, online: <https://www.whitehouse.gov/presidential-actions/space-policy-directive-2-streamlining-regulations-commercial-use-space/>.
[493] Tanja Masson-Zwaan, Rafael Moro-Aguilar and Aron Lentsch, "The Future Regulation of Suborbital Flight in Europe" (2014) 30 Space Pol'y J 75 [hereinafter Masson-Zwaan, Moro-Aguilar & Lentsch, "The Future Regulation"].
[494] For example, see G Di Antonio et al., "A model for setting a regulatory framework for the development of suborbital operations in Italy" (2017) 4 Space Safety Engineering J 138 [hereinafter Di Antonio et al., "A model for setting a regulatory framework"].

approach on regulating such vehicles and their operations.[495] Indeed, so long these activities remain confined to each Member State, a purely national regulatory approach may be suitable.[496] However, as soon as such activities will cross the airspace of other EU Member States, international law or indeed EU law would become applicable, and a choice of law would have to be made: air, space, both laws, or a new *sui generis* regime.[497]

Under Article 100(2) of the TEFU[498] and based on the shared competence principle of Article 4.2(g) of the TEFU[499], Member States, in the perspective of guaranteeing uniformity of standards, have delegated to the EU the competence of regulating aviation matters.[500] Indeed, only on topics that fall under either exclusive or shared competence, may the EU adopt binding Regulations, Directives and Decisions.[501] Article 4.2 of the TFEU provides an exhaustive listing of shared competences between the EU and Member States, which include transport and, therefore, aviation. For those shared competences listed in Article 4.2, the pre-emption principle applies, and it implies that the Member State's competence is 'subsidiary' to the EU competence, which means that they may exercise their competence only if the EU does not.[502] Space is not mentioned in this list, but, instead is allocated in Article 4.3, which provides that for space "[the EU] competence shall not result in Member States being prevented from exercising theirs".[503]

Therefore, although space falls under the shared competences of Article 4, its exclusion from the listing of paragraph 2 of the same article, and the specification of Article 4.3, imply the non-application of the pre-emption principle for space matters for which the EU has a rather "parallel" competence with Member States. According to Professor Masson-Zwaan:

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[495] Rafael Moro-Aguilar, "National Regulation", *supra* note 454 at 691.
[496] ICAO, *Concept of Sub-orbital Flights*, *supra* note 207 at 5 para 6.3.
[497] Moro-Aguilar, "National Regulation", *supra* note 454 at 685.
[498] *Treaty on the Functioning of the European Union*, 13 December 2007, (entered into force 1 December 2009), art 100(2) [hereinafter TFEU].
[499] *Ibid,* art 4.2(g).
[500] EC, *Regulation (EC) No 1008/2008 of the European Parliament and of the Council of 24 September 2008 on common rules for the operation of air services in the Community* [2008] OJ, L 293/3. See also Masson-Zwaan, Moro-Aguilar and Lentsch, "The Future Regulation"*, supra* note 454 at 676. For a broader perspective, see also "Summaries of EU Legislation", *Eur-lex* (online): <https://eur-lex.europa.eu/summary/chapter/transport/3205.html?root=3205>. Competences of the EU in the field of aviation are, among others, economic, passenger protection and liability, infrastructure, and security. For a broader perspective, see also "European Civil Aviation Handbook: Part I. Regulations and Directives", *European Commission* (online): <https://ec.europa.eu/transport/modes/air/internal_market/handbook/part1_en>.
[501] TFEU, *supra* note 498, arts 3 and 4.
[502] Tanja Masson-Zwaan, "Regulation of Sub-orbital Space Tourism in Europe: A Role for EU/EASA?" (2010) 35:3 Air & Space L J 263 at 268 [hereinafter Masson-Zwaan, "Regulation of Sub-orbital Space Tourism in Europe"].
[503] TFEU, *supra* note 498, art 4.3.

> For space, the competencies of EU and Member States 'co-exist', meaning that the Member State does not have to sit and wait for the EU to decide whether it will undertake action or not.[504]

The safety of civil aviation in the EU is regulated by the European Aviation Safety Agency (EASA), which was established in 2002 as an independent specialized expert body.[505] EASA regulates aviation safety, including types of certificates, airworthiness, air operations, and flight crew licensing, it authorizes foreign operators to operate to and from the EU, and it assists Member States in fulfilling the Chicago Convention obligations by transposing ICAO standards into law that is directly applicable in each State's territory.[506]

2.1 A European approach?

In 2008, the European Space Agency (ESA) suggested in its position paper on privately-funded suborbital spaceflight that human suborbital operation should be framed as aeronautics operations for which "civil aviation regulatory authorities of the countries concerned and the competent agencies of the European Community should be at the forefront of the setting up of a regulatory framework".[507] However, to date, no concrete Community initiative has been taken in this sense.

On the basis of the above paper, a group of authors (at the time working for EASA) advanced, on their behalf, a role for EASA for all rocked-powered *winged* airplanes.[508] This proposal, which identifies such vehicles as "Sub-orbital Aeroplanes" or SoA, however excludes all suborbital operations that encompass vertical launch and use *wingless* craft, or rockets (such as Blue Origin) from the competence of EASA.[509] The reason relies on the fact that EASA is not competent to regulate the design and operation of rockets, as they do not fall under the ICAO definition of aircraft, which is the

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[504] Masson-Zwaan, "Regulation of Sub-orbital Space Tourism in Europe", *supra* note 502 at 268.
[505] EC, *Regulation (EU) 2018/1139 of the European Parliament and of the Council of 4 July 2018 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency*, [2018] OJ, L 212/1, art 1(e) [hereinafter Regulation (EU) 2018/1139].
[506] *Ibid,* arts 75 and ss.
[507] European Space Agency (ESA), "ESA's Position on Privately-Funded Suborbital Spaceflight" (2008) at 2, online: <https://esamultimedia.esa.int/docs/gsp/Suborbital_Spaceflight_ESA_Position_Paper_14April08.pdf>. See also Masson-Zwaan, "Regulation of Sub-orbital Space Tourism in Europe", *supra* note 502 at 266.
[508] Jean B Marciacq et al., "Accommodating Sub-Orbital Flights into the EASA Regulatory System" in Ram Jakhu and Kuan-Wei Chen, eds, *Regulation of Emerging Mode of Aerospace Transportation*, Monograph series I, (Montreal: Centre for Research in Air and Space Law, 2008) 261 at 261-262 [hereinafter Marciacq et al., "Accommodating Sub-Orbital Flights into the EASA Regulatory System*"*].
[509] *Ibid* at 262.

same employed by Regulation (EU) 2018/1139.[510] Further, under the proposal, the regulation of SoA would instead fall under the competence of each Member State when they enter outer space,[511] as the authors indeed recognize EASA would not have competence for 'that (very short) outer space part of sub-orbital flight, unless it agrees with the States to enforce this responsibility on their behalf.'[512] The proposal finally envisaged that EASA complements the existing aviation regulatory and certificatory approach rather than create new *ad hoc* one for SoA.[513]

Such discrimination between *winged* and *wingless* suborbital vehicles is one the main flaws of the proposal since it would lead to a double regulatory regime (and different competent authorities) in the regulation of suborbital operations: one harmonized at a Union level for *winged* craft, and the other regulatory regime at the national level for *wingless* vehicles. Other than for the harmonization of rules, such a perspective would be highly inconvenient and unpredictable for the development of the industry, for the safety of civil aviation, and for future aerospace transportation in Europe.

Another flaw of the proposal is that should suborbital vehicles for PTP transportation be considered as aircraft within the EU, those coming from other States, such as the US where authorization is based on licensing, would need to respect all EASA regulations and standards including certification other than being subject to the agency's safety oversight.[514] Rafael Moro-Aguilar stated:

> if the U.S. and Europe adopt divergent approaches to regulating the emerging commercial human spaceflight industry, companies wishing to fly on both sides of the Atlantic will be forced to operate in very different regulatory environments. Vehicles may have to be developed in accordance with two different sets of regulations; and passengers will be treated differently depending on which country they are flying from.[515]

If one considers the particular type of vehicle and the highly burdensome set of requirements to certify traditional aircraft, such an approach would rather imply a hyper-simplification of current aircraft regulations, eventually resulting in restricted type certificates as the only means to certify such vehicles.

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[510] Regulation (EU) 2018/1139, *supra* note 505, art 3(28).
[511] Marciacq et al., "Accommodating Sub-Orbital Flights into the EASA Regulatory System*" supra* note 508 at 286-287.
[512] *Ibid* at 287.
[513] *Ibid* at 276.
[514] Masson-Zwaan, "Regulation of Sub-orbital Space Tourism in Europe", *supra* note 502 at 272.
[515] Moro-Aguilar, "National Regulation", *supra* note 454 at 696.

Another flaw of this proposal, as Professor Masson-Zwaan claims, is that:

> It would […] not be desirable for EASA to regulate only that portion of the activity that takes place in the 'air space' – not only because of the absence of an internationally accepted definition or delimitation but also because this would be highly impractical.[516]

Perhaps it would be wiser to modify Regulation (EC) No 1008/2008 and specifically extend EASA's role to space and rockets.[517]

3 Memorandum of cooperation between the United States and Italy

In 2013 Italy and the US signed the Framework Agreement for Cooperation and Use of Outer Space for Peaceful Purposes further transposed into Italian law n. 197/2015[518]. Based on the agreement, in 2014 ENAC and FAA-AST signed a Memorandum of Cooperation (MoC) for the Development of Commercial Space Transportation, later renewed and extended to the Italian Space Agency (ASI) on 30 June 2016.[519] Following the Memorandum, the Italian Ministry of Infrastructure and Transportation (MIT) issued Decree n. 354 of 10 July 2017 which, in identifying ENAC[520] as the national entity in charge of developing the regulatory framework for commercial suborbital transportation in Italy, sets key parameters for its development.[521]

A series of elements have pushed the MIT to identify ENAC as the natural subject responsible for developing such framework. Article 743 of the Code of Navigation provides that: "[a]ircraft means any machine designed to transport people or things by air".[522] This definition, which is mainly purpose-

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[516] Masson-Zwaan, "Regulation of Sub-orbital Space Tourism in Europe", *supra* note 502 at 272.
[517] *Ibid*.
[518] *Framework Agreement Between the Government of the United States of America and the Government of the Italian Republic for Cooperation and Use of Outer Space for Peaceful Purposes*, United States, Italy, 19 March 2013, US Ser 16-211(entered into force 11 February 2016). See also Legge 16 novembre 2015, n 197, GU n 292 del 16-12-2015.
[519] *Memorandum of Cooperation in the Development of Commercial Space Transportation Between Federal Aviation Administration, Department of Transportation, United States of America and the Italian Ente Nazionale per l'Aviazione Civile, Italian Republic*, United States, Italy, 12 March 2014. See also *Memorandum of Cooperation in the Development of Commercial Space Transportation Among Federal Aviation Administration, Department of Transportation, United States of America and the Italian Ente Nazionale per l'Aviazione Civile, Italian Republic and the Agenzia Spaziale Italiana*, Italian Republic, United States, Italy, 30 June 2016.
[520] Article 687 of the Code of Navigation recognizes ENAC as the exclusive national regulatory Authority for civil aviation. See Italian Code of Navigation, art 687. See also Legge 9 novembre 2004, n 265, GU n.264 del 10-11-2004.
[521] Italian Republic, Ministry of Infrastructures and Transportation, *Sustainable Development of the Commercial Suborbital Flights Sector*, Decree n. 354 of 10 July 2017 [translated by author].
[522] Italian Code of Navigation, art 743 (in Italian).

based, is different from that of ICAO, and broad enough to encompass such operations at least in both parts of travel through air. Further, Horizontal-Take-off-Horizontal-Landing (HOTOL) are, at least for the near future, the focus of such cooperation. Further, as these crafts are winged vehicles, at least in the launching and reentry phase, they fully fall under the ICAO definition of aircraft. Another important element for MIT to determine its choice is that suborbital trajectories will intersect and share the airspace below FL650 (Flight Level 650) during both launch and re-entry. Finally, Italian spaceports will be selected from among existing civil aerodromes approved under EU (European Union) Regulation 139/2014.[523] Indeed, as the construction of brand-new spaceports is highly unlikely to happen in Italy (and Europe),[524] ENAC is issuing criteria to let existing airports host suborbital operations.[525]

ENAC's objective is to accommodate commercial suborbital operations within the current aviation and airspace system.[526] One of the important aspects of the envisaged framework is the introduction, at least at the initial stages of such activities, of qualitative performance-based requirements for the safety of the occupants to assure a minimum level of safety.[527] In the future, a shift towards a "certification-like" approach for the vehicle, organizations, crew, spaceports, and STM/ATM service providers is envisaged to ensure adequate safety standards for both the uninvolved parties and the occupants.[528]

One of the key objectives of ENAC is to establish bilateral agreements with foreign Countries (beginning with the US government) to develop international interoperability of suborbital operations, implying a mutual recognition of certifications/licensing.[529] For the sake of such interoperability, ENAC bases the development of such regulatory framework on the current US regulation, namely Parts 431, 437 and 460[530] adapted to fit within the National and European legal framework.[531]

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[523] Di Antonio et al., "A model for setting a regulatory framework" *supra* note 494 at 138-139. See also EC, *Commission Regulation (EU) No 139/2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council*, [2014] OJ, L 44/1.
[524] Di Antonio et al., "A model for setting a regulatory framework", *supra* note 494 at 141.
[525] *Ibid* at 142.
[526] The envisaged suborbital operations include tourism, business, microgravity experimentations and astronauts' training. See *Ibid* at 138.
[527] *Ibid* at 140.
[528] *Ibid* at 144.
[529] *Ibid* at 141-142.
[530] US Code of Federal Regulation (CFR), Title 14 Aeronautics and Space, Volume 4, Chapter III, Parts 400–460, Commercial Space Transportation.
[531] Di Antonio et al., "A model for setting a regulatory framework", *supra* note 494 at 142.

Despite several European stakeholders demanding full certification,[532] in September 2011 the European Commission put the perspective of having EASA regulate suborbital operation on hold. Instead, a new directive from the Commissioner's Cabinet to investigate a regulatory path similar to the FAA/AST "Launch Licensing" procedure has been advanced.[533] Nevertheless, so far, no concrete steps have been taken. Although ENAC's proposal presents uncertain aspects, such as potential divergences, particularly regarding the safety of passengers of these vehicles and the lack of a clear EU approach, it promises to be a valuable means to concretely address the issue. This initiative could be an early sign that an international regulatory approach to suborbital PTP operations should be delegated to ICAO.

Conclusion

This chapter has shown the risk of fragmentation among national or regional regulatory approaches to such activities. Major differences could be fostered by a diversity of national interests, whether economic or political, or for reasons of suitability to national legal framework.[534] Clearly, fragmentation undermines the safe development of the suborbital PTP industry. Further, even the most comprehensive national regime existent, that of the US, does not seem suitable to promote the safety of suborbital international PTP operations. It appears necessary that all States follow a single regulatory regime developed internationally and with particular emphasis on safety. As is further analyzed in the following chapter, a global forum for such development could be provided by ICAO.

Chapter V
Chicago Convention as a Self-Contained Regime

Prior to advancing and supporting the hypothesis of ICAO extending its jurisdiction over suborbital flights as an interim proactive solution to the lack of an institutionalized international regulatory regime to govern such new activities, it is important to understand whether the system of ICAO Annexes is a valid, if not the sole, option that could foster safety through the development of new standards. Especially in light of a deadlocked situation on the international stage pertaining the

[532] Moro-Aguilar, "National Regulation", *supra* note 454 at 694.
[533] *Ibid*.
[534] von der Dunk, "Space Tourism", *supra* note 452 at 152.

possibility of achieving new binding international norms regulating such activities, this chapter focuses on the legal force of ICAO SARPs and on how their implementation and observance is ensured.

1 ICAO quasi-legislative power to promulgate standards and recommended practices

The preamble of the Chicago Convention provides that the Signatory States have "agreed on certain principles and arrangements in order that international civil aviation may be developed in a *safe and orderly* manner*"*.[535] This is why the Convention, on one hand, under Article 44, vested ICAO with

> the aims and objectives […] [of] develop[ing] the principles and techniques of *international air navigation* […] so as to:
> (a) Insure the *safe* and orderly growth of international civil aviation throughout the world;
> […]
> (d) Meet the needs of the peoples of the world for *safe*, regular, efficient and economical air transport;
> […]
> (h) Promote *safety* of flight in international air navigation;
> (i) Promote generally the development of all aspects of international civil aeronautics.[536]

On the other hand, the Convention – under Article 37 – requires that

> Each Contracting State undertakes to collaborate in securing the *highest practicable degree of uniformity* in regulations, standards, procedures and organization […] in all matters in which such uniformity will facilitate and improve air navigation.[537]

To this end ICAO *shall* adopt and amend *any time it is necessary*, international standards, recommended practices and procedures[538] dealing with:

> (a) Communications systems and air navigation aids, including ground marking;
> (b) Characteristics of airports and landing areas;

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[535] Chicago Convention, *supra* note 65, Preamble [emphasis added].
[536] *Ibid*, art 44 [emphasis added].
[537] *Ibid*, art 37.
[538] ICAO, in addition to SARPs, develops Procedures for Air Navigation Services (PANS), manuals, circulars and other guidance materials. All these documents constitute "the comprehensive technical safety code for civil aviation". See Jiefang Huang, *Aviation Safety through the Rule of Law,* (Alphen aan den Rijin: Kluwer International, 2009) at 45 [hereinafter Huan, *Aviation Safety*].

(c) Rules of the air and air traffic control practices;
(d) Licensing of operating and mechanical personnel;
(e) Airworthiness of aircraft;
(f) Registration and identification of aircraft;
(g) Collection and exchange of meteorological information;
(h) Log books;
(i) Aeronautical maps and charts;
[…]
(k) Aircraft in distress and investigation of accidents;
and such other matters concerned with the safety, regularity, and efficiency of air navigation as may from time to time appear appropriate.[539]

Contrary to the Paris 1919 regime,[540] under Article 37 of the Chicago Convention, the number of topics that could be regulated by ICAO in the form of SARPs is not limited. ICAO has, therefore, an *extensive* power to provide technical regulations that cope with and support technological advancement. Under Article 54(l) the adoption of SARPs is a *mandatory function* of Council which shall designate them as Annexes to the Convention *for convenience* and notify all contracting States of the action taken.[541] Therefore, the Convention on one hand provides for ICAO to set SARPs on international civil aviation but, on the other, it requires that SARPs are contained in documents annexed to it. At first sight, this may appear as an anomaly in which the Convention abnegates its own legitimacy, affecting its validity as a treaty: [542]

> an instance where a valid international treaty forms an organ for the implementation of its policy as contained in the provisions of the treaty and thereafter, by implication, disassociates itself from the regulatory provisions adopted by that organ by refusing to recognize the documents which contain such provisions as part of the treaty itself.[543]

[539] Chicago Convention, *supra* note 65, art 37 [*emphasis added*].
[540] Paris Convention, *supra* note 41, art 34(c).
[541] Chicago Convention, *supra* note 65, art 54(l).
[542] R I R Abeyratne, "The legal Status of the Chicago Convention and its Annexes" (1994) 29:3 Air & Space L J 113 at 118 [hereinafter Abeyratne, "The Legal Status of the Chicago Convention"].
[543] *Ibid.*

Nevertheless, a careful analysis of the SARPs' enactment process and of their legal force leads to a different (and opposite) conclusion.

Pursuant to Article 57, the Air Navigation Commission (ANC) shall consider and recommend the adoption of modifications of the Annexes to the Council[544] which is obliged to take into consideration such recommendations.[545] Although the adoption of SARPs lies within the mandatory task of the Council,[546] the material task of developing regulations remains with the Air Navigation Commission (technical matters), the Air Transport Committee (economic matters), the Committee on Joint Support of Air Navigation Services, and the Finance Committee,[547] through which States *heavily influence* the content of SARPs.[548] Member states have, in fact, the right of being represented on the various technical sub-commissions of the ANC, of recommending issues for study to the ANC, and of being supplied with draft SARPs which they return with meaningful and numerous comments.[549] SARPs are not issued *until after extensive consultation* with Member States, which takes around four years, and until after *consensus* is achieved.[550] The Annexes are therefore promulgated only after all States agree on their content and on the feasibility to implement them. Before a new Annex or amendment is promulgated, under Article 90(a), 2/3 of the Council votes its approval, after which the new Annex or amendment is submitted to each contracting State. The Annex or amendment thereto "shall become effective within three months after its submission to the contracting States or at the end of such longer period of time as the Council may prescribe, *unless in the meantime a majority of the contracting States register their disapproval with the Council*".[551] This implies that, until the last steps of the enactment procedure, States can – in majority – block the promulgation of the Annex or amendment. Therefore, Articles 37, 54(l) and 90 provide the ICAO Council with quasi-legislative powers in the adoption of standards and recommended practices[552], the content of which is *highly representative of the States' consensus*. In the words of Dr. Abeyratne:

[544] Chicago Convention, *supra* note 65, art 57 (a).
[545] *Ibid,* art 54 (m).
[546] *Ibid,* art 54 (l).
[547] *Ibid,* Chapter X.
[548] "ICAO, "How it Works", *ICAO* (online): <https://www.icao.int/about-icao/pages/how-it-works.aspx>.
[549] Dempsey, *Public International Air Law*, *supra* note 18 at 70; Chicago Convention, supra note 65, art 57 (b).
[550] Dempsey, *Public International Air Law*, *supra* note 18 at 69 [emphasis added].
[551] Chicago Convention, *supra* note 65, art 90(a) [emphasis added].
[552] *Ibid* arts 37, 54(l) and 90. See also Michael Milde, "The Chicago Convention – After Forty Years" (1984) 9 Ann Air & Sp L 119 at 123.

> the ICAO Council […] has power to prescribe rules of civil conduct (legislative power) or in the least a power that resembles by analogy the ability to prescribe rules of conduct (quasi-legislative power).[553]

One of the most innovative aspects of such power is the Council's ability to adopt technical rules without the need of a lengthy process of ratification.[554]

Although a compulsory nature of standards seems coherent with the quasi-legislative power of the Council, the Convention does not provide any definition of standards and of recommended practices. Nevertheless, the Assembly, ICAO's main policy-setting organ in which each Member State has a seat with one vote,[555] has provided a clear definition of both:

In the practice of ICAO, a Standard is:

> any specification for physical characteristics, configuration, material, performance, personnel, or procedure, the uniform application of which *is recognized as necessary* for the safety or regularity of international air navigation and to which *Member States will conform* in accordance with the Convention; in the event of impossibility of non-compliance, notification to the Council is compulsory under Article 38 of the Convention.[556]

A recommended practice, on the other hand, is:

> any specification […] the uniform application of which is recognized as desirable […] and to which member States will endeavor to conform […].[557]

These definitions are embodied in resolution A1-31 promulgated at the first ICAO General Assembly. Since then, these definitions have been maintained unchanged and have been incorporated in every

[553] Abeyratne, "The Legal Status of the Chicago Convention", *supra* note 542 at 121.
[554] Eugene Sochor, *The Politics of International Aviation* (McMillan: London, 1991) at 58.
[555] Chicago convention, *supra* note 65, art 48b.
[556] ICAO, *Definition of "International Standards" and "Recommended Practices"*, Res A1-31 (1947), ICAO Doc 4411 at 28 [emphasis added].
[557] *Ibid* at 29.

Annex to the Convention.[558] Throughout the years, they have also been reiterated in other Assembly resolutions until the latest.

The Assembly quorum is reached with the presence of the majority of Contracting States for the meeting, and decisions require a simple majority of the votes cast.[559] Nevertheless, in practice, most assembly decisions are taken by *consensus* and decisions on fundamental matters are usually taken in the form of a *resolution*.[560] Many resolutions constitute detailed policy-setting documents for ICAO organs and for the Member States, containing principles, policies or guidance for the latter.[561]

It is controversial whether a resolution has any legally binding effect on member States;[562] nevertheless, as Professor Weber pointed out:

> regardless of this controversy, the persuasive nature of the material used in such resolutions, the high degree of expertise on which it is usually based, and the general acceptance at the time of adoption usually have the effect of ensuring their implementation.[563]

ICAO has 191 Member States, virtually all the nations of the Earth.[564] Considering the consensus method in adopting most of the Assembly resolutions, and the fact that no State has protested such definitions, the consistent reiteration of such definitions is also evidence of State practice in accepting their meaning. In the words of Professor Brownlie, "[although] these resolutions are not binding on member States […] [the] acceptance by a majority vote constitutes *evidence* of the opinions of governments in the widest forum for the expression of such opinions".[565] They function as an authoritative interpretation of the principles of the Convention and indicate the subsequent practices in the application of the treaty.[566] These policy declarations are not mere statements of an organ of the organization but *decisions* of the member States who are members of the Assembly.[567]

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[558] For e.g., see ICAO, *Annex 1 to the Convention on International Civil Aviation, Personnel Licensing*, 11th ed (2011).
[559] Chicago Convention, *supra* note 65, art 48 c).
[560] Weber, *ICAO*, *supra* note 72 at 31 para 56.
[561] *Ibid*.
[562] See "Soft Law" in *Encyclopaedia of Public International Law*, Vol IV by R Bernhardt (Amsterdam, London, New York, Tokyo, North Holland, Elsevier, 2000) at 452 et seq.
[563] Weber, *ICAO*, *supra* note 72 at 31-32 para 58.
[564] "Current List of Parties to Multilateral Air Law Treaties", *ICAO* (online): <https://www.icao.int/secretariat/legal/lists/current%20lists%20of%20parties/allitems.aspx>.
[565] Ian Brownlie, *Principles of Public International Law*, 7th ed, (Oxford and New York: Oxford University Press, 2008) at 15 [emphasis added].
[566] Henaku, *The Law on Global Air Navigation by Satellite – A Legal Analysis of the ICAO CNS/ATM,* (Leiden: AST, 1998) at 44 [hereinafter Henaku, *The Law on Global Air Navigation by Satellite*].
[567] *Ibid* at 45.

In fact, it would be hardly arguable that these instruments are not intended to have any legal consequence within the international air law regime. Resolutions of the General Assembly of the United Nations such as the Universal Declaration of Human Rights of 1948[568] or the Declaration of Space Principles of 1963[569] have legal content and have become binding – or are in fact declaratory of customary obligations.[570]

From the reading of the definition of standards and recommended practices one may – at first – discern the non-binding force of the latter versus the binding of the former. Standard, in fact, "*is recognized as necessary* for the safety or regularity of international air navigation"[571], the guarantee of which is the very objective of the Convention, and each "*Contracting State will conform"* [572] to it. States will therefore conform to the requirement of securing that objective through the standard that States have first accepted as such. Although *will* is less emphatic of the auxiliary *shall*, which clearly expresses compulsion, the definition makes clear that implementing a standard is not a mere courtesy or habit,[573] but, on the contrary, a form of obligation to comply with. Nevertheless, notwithstanding that even the text of the Convention, as analyzed below, poses standards on a higher level than recommended practices, the distinction between the two is increasingly blurred. Their essential difference relies on the fact that while silence in a standard implies compliance, for recommended practices the consent to comply must be clearly expressed. However, once the latter are complied with, the effects do not differ from those arising from the former.[574]

For years a doctrinal debate has surrounded the issue of the legal force of SARPs and particularly of standards. Therefore, prior to coming to any conclusion on it, further examination of the Convention and of ICAO and States' practices is required with special focus on the legal force of standards. Once this is identified, it will be easier to attribute the proper weight to recommended practices, taking into account the difference between the two as outlined above.

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[568] *Universal Declaration of Human Rights*, GA Res 217A (III), UNGAOR, 3rd Sess, supp No 13, UN Doc A/810 (1948) 71.
[569] UNGA Res 1962 (XVIII), *supra* note 96.
[570] See Stephen M Schwebel, "The Effect of Resolutions of the U.N. General Assembly on Customary International Law" (1979) 73 Proc of the Annual Meeting American Soc of Int L 301 at 306.
[571] Assembly Res. A1-31, *supra* note 556 at 28.
[572] *Ibid*.
[573] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 45.
[574] Huang, *Aviation Safety through the Rule of Law, supra* note 538 at 194.

1.1 ICAO standards: are they binding or not?

The reading of Article 37 in conjunction with 38 provides ground for doctrinal debate over the binding legal force of ICAO standards, especially if one considers that:

- Article 38 provides Contracting States the possibility to depart from a standard;[575]
- The Council shall, "*for convenience*, designate them as Annexes to the Convention" – as they are not part of it;[576]

It appears clear in doctrine that standards are binding obligations when applied over the high seas. That means the rules of conduct prescribed by the Council should be abided by States – without possibility of departure – on 72% of the Earth's surface.[577] According to Bin Cheng:

> [t]he only exception to this freedom to depart from international standards is in respect to rules of the air over the high seas. Each contracting State undertakes to ensure that aircraft of its registration, when flying over the high seas, shall comply with the rules of the air established by the Organisation […].[578]

Therefore, the following analysis focuses on the possibility of a State not to adopt its national legislation in accordance with ICAO standards. Considering the key role standards play in keeping aviation safe, it is essential to clarify whether they have binding force, and if not, what their legal force is. Prior to advancing any hypotheses on the possibility of extending ICAO jurisdiction to the new challenges posed by emerging aerospace activities, it is fundamental to understand if the legal force of standards and the mechanism to guarantee their compliance (whether directly or indirectly) are valid means to face the lack of a comprehensive international legal regime governing aerospace activities so as to secure their safety and efficiency. Uniformity of international regulations that comprehensively govern aviation and space activities is essential for the safety of both. Nevertheless, should States be free to ignore any standard at any time, it would be pointless to seek a role for ICAO in this new challenge.

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[575] Chicago Convention, *supra* note 65, art 38.
[576] *Ibid*, art 54(l).
[577] *Ibid*, art 12.
[578] Bin Cheng, "Centrifugal Tendencies in Air Law" (1957) 10:1 Current Legal Problems LJ 200 at 206 [hereinafter Cheng, "Centrifugal Tendencies in Air Law"].

1.2 Prominent doctrinal positions on the non-binding nature of ICAO standards

Dr. Cheng sustains that ICAN, in contrast to ICAO, had true legislative power. [579] The Commission, in fact, by a ¾ majority of the total possible votes which could be cast if all States were present, was able to amend the Annexes to the Paris Convention, except Annex H, with binding effects on all Member States.[580] Under Article 39 of the Paris Convention, in fact, the Annexes have "the same effects […] as the Convention".[581] According to Cheng, because Annexes to the Chicago Convention are not part of it, and because Article 38 deprives them of "compulsory force", they cannot bind the States to align their national legislation to them.[582] Regarding Article 38, Cheng states that:

> For it would appear that even after a standard or an amendment has come into force, a State may, *at any time*, *either initially or subsequently*, decide not to comply with a part or the whole of such a standard or amendment. Its only obligation consists in giving 'immediate notification to the International Civil Aviation Organisation of the differences between its own practice and that established by the international standard' […]. There is thus no duty under the Convention to comply with an international standard.[583]

According to Buergenthal, Contracting States are not obliged to comply or to implement any provision of a duly promulgated Annex or amendment thereto, "unless they find it '*practicable'* to do so".[584] The author's ground for this assertion is based on what he defines as escape clauses of Articles 22, 23, 28 and 37 and on his interpretation of Article 38 of the Chicago Convention, all of which present the element of the "practicability of compliance".[585] He contends that in fact, especially according to the latter article, "Contracting States have retained the right to depart from the provisions of an existing

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[579] *Ibid* at 203.
[580] Paris Convention, *supra* note 41, art 34(c).
[581] *Ibid*, art 39.
[582] Cheng, "Centrifugal Tendencies in Air Law", *supra* note 578 at 204.
[583] *Ibid* at 205 [emphasis added].
[584] Thomas Buergenthal, *Law-Making in the International Civil Aviation Organization* (Syracuse: Syracuse University Press, 1969) at 76 [emphasis added] [*hereinafter* Buergenthal, *Law-Making in ICAO*].
[585] *See* Chicago Convention, *supra* note 65,

- art. 22: "all practicable measures"
- art. 23: "undertakes, so far as it may find practicable"
- art. 28: "undertakes, so far as it may find practicable"
- art. 37: "undertakes to collaborate in securing the highest degree of uniformity"
- art. 38: "which finds it impracticable to comply"

standard *any time they decide to do so, provided only that they notify the organization accordingly*".[586] Nevertheless, the author recognizes three hypotheses in the Convention where States do not enjoy this freedom of action, respectively under Articles 12, regarding the application of standards over the high seas, 29 and 34, regarding the journey log book, and 33, regarding the recognition of certificates and licenses that respect the standards of the Convention.[587] Therefore, his view is that only when the Convention provides a clear duty – without the possibility of escape – are standards binding; otherwise, they must be considered as non-binding.[588]

It is hard to understand how the same standards that are binding over the high seas are not within the State jurisdiction that decides to ignore it. One should note, in fact, that standards do not make differences over a zone of application. Nevertheless, Buergenthal, in support of his interpretation, further looks at the Organization's practices and concludes that not only does the Council require States to notify of differences on the date the standard become applicable, but "Contracting States retain the right to enact legislation in conflict with an existing standard *whether or not they have previously adhered to it*"[589] – that means even *after* the standard has become fully applicable within a State jurisdiction. He, in fact, continues "that is no obligation *at all*, for a State can always find the necessary "practical" reasons to justify non-compliance with or deviation from international standards".[590]

Buergenthal goes further by arguing the untenability of Dr. Cheng's assertion that "[once a state has decided to not comply, either initially or subsequently, with a standard] failure to give immediate notification of non-compliance is a breach of the Convention".[591] Cheng's position, in fact, would hold the delinquent State liable to another Contracting State if "[this] latter, or one of its nationals, suffers damage as a result of a mistaken belief, induced by the lack of notification, that the former contracting State was complying with a given international standard".[592] Therefore, the only legal force of a standard that Cheng allows is a residual one that is owed to the damage arising from an omission.[593] Thus, according to Buergenthal,

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[586] Buergenthal, *Law-Making in ICAO, supra* note 584 at 78 [emphasis added].
[587] *Ibid* at 79-80.
[588] *Ibid.* see also Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 33.
[589] Buergenthal, *Law-Making in ICAO*, *supra* note 584 at 79 [emphasis added].
[590] *Ibid* at 78 [emphasis added].
[591] *Ibid* at 100. Citing: Cheng, "Centrifugal Tendencies in Air Law", *supra* note 578 at 200
[592] Buergenthal, *Law-Making in ICAO*, *supra* note 584 at 100 *Citing:* Cheng, "Centrifugal Tendencies in Air Law", *supra* note 578 at *205-206.*
[593] Cheng, "Centrifugal Tendencies in Air Law", *supra* note 578 at 205-206. See also Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 35.

> no state or pilot can justifiably rely on the absence of reported differences as indicia that a particular standard […] is in force in or being complied with by a State which has not filed the notice required by article 38.[594]

The only common ground between Cheng and Buergenthal, although based on different reasonings, is that SARPs do not have "mandatory or compulsory legal force".[595]

Such interpretations perhaps manifest a lack of clarity on what the precise legal force of a standard is. A deeper analysis of the Convention, and especially of Article 37 and 38, reveals a different result.

1.3 Are standards soft law?

Like the above authors, Professor Matte did not recognize ICAO standards as having the same legal force of the Convention. He identified them as "soft law".[596]

Soft law is increasingly becoming influential in dictating a State's conduct in international relations,[597] and it often constitutes the first step towards the establishment of binding legal regimes.[598] This normative instrument is increasingly used as an alternative to multilateral agreements. For example, in the outer space field, treaty formation has *de facto* been replaced by soft-law in the last four decades.[599] Soft law also has the advantage of not being subject to a complex ratification process;[600] nevertheless, its legitimacy and normative force derive from the self-interests of the States involved in its drafting process, which is consensus based.[601] In this sense Galloway sustains that enforcement mechanisms are not necessary for soft law to have a legal nature.[602]

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[594] Buergenthal, *Law-Making in ICAO*, *supra* note 584 at 100.
[595] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 35.
[596] Nicolas M Matte, "The Chicago Convention, Where From and Where To, ICAO?" (1994) XXLI Annals of Air and Space L 371 at 378.
[597] Valentina S Vadi, "Investing in Culture: Underwater Cultural Heritage and International Investment Law" (2009) 42:3 Vand J Transnat'l L 853 at 866.
[598] Francesco Francioni, "Beyond State Sovereignty: The Protection of Cultural Heritage as a Shared Interest of Humanity" (2003–2004) 25:4 Mich J Intl L 1209 at 1227.
[599] Examples are: memoranda of understandings, framework agreements, voluntary regimes, codes of conduct, and case law decisions. See Jonathan F Galloway, "Revolution and Evolution in the Law of Outer Space" (2008–2009) 87:2 Neb L Rev 516 at 518 [hereinafter Galloway, "Revolution and Evolution"].
[600] Kal Raustiala, "Form and Substance in International Agreements" (2005) 99:3 AJIL 581 at 591.
[601] Galloway, "Revolution and Evolution", *supra* note 599 at 519.
[602] *Ibid.*

International "soft law" is a concept vastly employed in practice by international organizations, especially the United Nations,[603] where "it is used to express commitments which are more than policy statements but less than law in its strict sense".[604] It consists of a kind of oxymoron between hard law and non-law.[605] It does not exist among the source of Article 38 of the ICJ Statute,[606] and its existence as a source of law is highly debated.[607] It is widely agreed, however, that "soft law" refers to "rules of conduct which, in principle, have no legally binding force but which nevertheless may have practical effects".[608] Soft law is also characterized by an array of "indirect-enforcement" mechanisms such as persuasion, social or peer pressure, self- interest and imitation.[609]
Purists of Kelsen's theory of law concede that soft law could entail legal consequences only if determined by a hard-legal norm.[610]

In broad lines, as Weiss points out, a non-exhaustive difference between hard law, soft law and non-law may consist of the following:

- hard law is binding by definition.
- soft law is not binding but habitually complied with by international entities, hence also referred to as law;
- "non-law" does not have the force of law and compliance with it is commonly deemed convenient or desirable but not due to a sense of obligation owed other international entities.[611]

One should note, however, that the delimitation between soft and hard law, and, in certain cases, between soft-law and non-law, especially in the international context, has become increasingly blurred. Therefore, a precise separation and categorization is not possible in all cases of norms having legal

[603] Ignaz Seidl-Hohenveldern, *International Economic "Soft Law*", Recueil des cours – Academie de Droit International de La Haye Vol. 163 (Sijthoff & Noordhoof, 1979) at 165.
[604] Daniel Thürer, "Soft Law" (2009), Max Planck Encyclopedia of Public International Law (online) at A.1.2.
[605] Friedl Weiss, "The Device of Soft Law: Some Theoretical Underpinnings", in Friedl Weiss and Armin J Kammel (eds), *The Changing Landscape of Global Financial Governance and the Role of Soft Law*, Nijhoff International Trade Law Series, vol. 14 (Leiden: BRILL, 2015) at 51 [hereinafter: Friedl Weiss, "The Device of Soft Law"].
[606] ICJ Statute, supra note 43, art 38.
[607] Friedl Weiss, "The Device of Soft Law", *supra* note 605 at 51.
[608] Francis Snyder, "Soft Law and Institutional Practice in the European Community" in S Martin (ed.), *The construction of Europe: Essays in Honour of Emile Noel*, (Dordrecht: Springer Netherlands, 1994) at 197-198. Citing: Snyder, "The Effectiveness of European Community Law: Institutions, Processes, Tools and Techniques" (1993) 53 Modem Law Rev J 19 at 32.
[609] Friedl Weiss, "The Device of Soft Law", *supra* note 605 at 53.
[610] *Ibid* at 52.
[611] *Ibid* at 54.

force. It would be more convenient to frame legal norms within a range that goes from pure hard law to the limit of non-law.

Although the exact legal relevance is difficult to categorize within firm boundaries, it is sure that soft law has a minimum of legal relevance. In the words of Jakhu, Freeland and Chen:

> [it] cannot and should not be readily disregarded as legally insignificant […] soft law provisions can declare the existence of customary law, or can provide a basis for identifying the gradual formation of customary law.[612]

The authors refer to Thürer who sustains that soft law is:

> "a complex of norms *lacking binding force, but producing significant legal effects nevertheless*"[613] its utility stands in the major freedom of action states have on "future development of technical knowledge, including economic, ecological, and scientific factors"[614] which may be difficult to predict.[615]

According to Lowe, the identification of soft law should rely on

1) the processes by which the rule is articulated and
2) the consequences of its breach[616]

As seen above, while the process of the promulgation of SARPs and procedures has, indeed, quasi-legislative aspects from which necessarily should flow legal effects, to understand whether a standard is soft-law, the consequences of its breach (but also of its non-implementation) shall be examined. Nevertheless, prior to exploring such consequences, it is necessary to analyze the text of the Convention.

Could the right to deviate from standards justify the denial of an obligation?[617]

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[612] Ram Jakhu, Steven Freeland & Kuan-Wei Chen, "The Sources of International Space Law: Revisited" (2018) 67 ZLW 606 at 651-652 [hereinafter Jakhu et al., "The Sources of International Space Law"].
[613] Thürer, "Soft Law", *supra* note 604 at para 37.
[614] *Ibid* para 6.
[615] Jakhu et al., "The Sources of International Space Law", *supra* note 612 at 651. See also Thürer, "Soft Law", *supra* note 604 at para 6.
[616] V Lowe, "Sustainable Development and Unsustainable Arguments", *in* Alan Boyle and David Freestone (eds.), *International Law and Sustainable Development: Past Achievements and Future Challenges* (Oxford and New York: Oxford University Press, 1999) at 30.
[617] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 27.

1.4 Standards and the Chicago Convention

During the *travaux preparatoires* of the Convention, the Committee on Technical Standards and Procedures recognized how "universal standardization in some matters is *necessary* to international air navigation"[618] and in some other *desirable*[619] and that the Convention should have established "*as clearly as possible* the extent of the obligation which may be imposed under the various technical documents".[620] Therefore, one should expect that the language of the Convention clearly states when standardization is necessary – and therefore obligatory –, the precise extent of the obligation, and when it is merely desirable. To verify, it is necessary to analyze Articles 37 and 38 and the logic of the legal formulations adopted in the Convention.

1.5 The Scope of Articles 37 and 38

The meaning of the wording of Articles 37 and 38 shall be interpreted within the object and purpose of the Convention[621] and taking into account the hierarchical relationship of the obligations contained therein.[622]
Article 37 provides that:

> Each contracting State *undertakes* to *collaborate* in *securing* the *highest practicable degree of uniformity* in regulations, standards, procedures, and organization […] in *all matters in which such uniformity will facilitate and improve air navigation*.[623]

The word "undertake" means "to guarantee, to engage in,[624] to promise and to perform, to put oneself under obligation to perform[625]"; "Collaborate" should be seen as "cooperative agreement of two or more parties to work jointly towards a common goal," [626] as "an obligation to collaborate in securing

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[618] *Proceedings*, *supra* note 62, Vol II, Report of the Committee II, Technical Standards and Procedures at 703 [emphasis added].
[619] *Ibid*.
[620] *Ibid* at 704 [emphasis added].
[621] VCLT, *supra* note 144, art 31.
[622] Diane A Desierto, *Necessity and National Emergency Clauses - Sovereignty in Modern Treaty Interpretation* (Leiden and Boston: Martinus Nijhoff Publishers and VSP, 2012) at 7-8.
[623] Chicago Convention, *supra* note 65, art 37 [emphasis added].
[624] "Undertake", *Black's Law Dictionary* (online): <https://thelawdictionary.org/undertake/>.
[625] "Undertake", *Webster's Ninth Collegiate Dictionary* (Markham: Thomas Allen & Sons Ltd., 1987).
[626] "Collaboration", *Black's Law Dictionary* (online): <https://thelawdictionary.org/collaboration/>.

a certain objective";[627] "Securing" means "to guarantee or make certain […] the discharge of an obligation".[628] Therefore, each Contracting State put itself under the obligation to cooperate to make certain that the highest practicable degree of uniformity is realized through complying with the regulation and standards adopted under the Convention.[629] Article 37 requires States to undertake positive actions, i.e. give effect to SARPs, which is the *conditio sine qua non* to reach the very objectives of the treaty.[630] Therefore, the primary duty that Article 37 calls for is an obligation of compliance.

The *greatest extent practicable* shall be intended as the need to guarantee full consistency with SARPs and procedures unless there is an element that inhibits or makes *impossible* such compliance. Although the Convention recognizes the complete and exclusive sovereignty of States over the airspace above their territory,[631] this article dilutes the notion of sovereignty. One should note that the very first instrument of international law has put a limitation on States' sovereignty and, at least since the Nuremburg Trials, limitations have greatly increased. As Prof. Dempsey pointed out, law has evolved, and will continue to, towards broader international limitations of State sovereignty in favor of a more ubiquitous global governance.[632] Jakhu, Freeland and Chen outline how international law has evolved from law governing relations and co-existence between States to law governing cooperation between States.[633]

Within this perspective, the article not only imposes an *obligation of cooperation* but also creates *expectations* in the international community that these norms will be complied with by everyone save in exceptional cases.

The obligation to comply with technical regulations arising from Article 37 and the exceptional and limited nature of non-compliance is further reinforced by the prefatory clause to Article 38 which allows "any State which finds it *impracticable* to comply"[634] to actually *depart* from a standard. *This sentence would not be necessary unless is intended to provide a derogation to an enforceable norm*.[635] The prefatory clause of Article 38 uses the word "comply", the legal meaning of which is "to act in

[627] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 38.
[628] "Secure", *Black's Law Dictionary* (online): <https://thelawdictionary.org/secure/>.
[629] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 38.
[630] *Ibid* at 40.
[631] Chicago Convention, *supra* note 65, art 1.
[632] Dempsey, *Public International Air Law*, *supra* note 18 at 20.
[633] Jakhu et al., "The Sources of International Space Law"*, supra* note 612 at 607.
[634] Chicago Convention, *supra* note 65, art 38 [emphasis added].
[635] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 42.

accordance with ones' obligations, to carry them into effect".[636] It underlines the *compulsory* nature of complying with standards. Further, as notification shall be given only when compliance is impracticable, it is logical that the normal course of Article 37 prescriptions is *full* compliance. This assumption is further reinforced by the text of Article 38 which, with regards to recommended practices that are not binding by their very nature, does not provide for any derogation for non-complying with them.[637]

A deeper analysis of Article 38's prefatory clause further provides evidence of the legally binding nature of standards:

- Any State which finds it *impracticable to comply in all respects* with any such international standard or procedure,
- or to bring its own regulations or practices *into full accord* with any international standard or procedure after amendment of the latter,
- or which *deems it necessary to adopt regulations or practices differing* in any particular respect from those established by an international standard[638]

The terms employed in the Convention are presumed to have been used according to the contemporary[639] and general meaning understandable by all drafting parties at the conclusion of the treaty.[640]

Impracticability implies the occurrence of a condition which prevents one party from complying with its obligation. The reasons of impracticability may be endless for a State; for example, financial struggle, lack of expertise, etc. The Convention, therefore, in recognizing the possibility that a State may find itself in a situation where compliance is *extremely* burdensome, has left to the State's subjective evaluation the identification of a situation where compliance would be impracticable.[641]

Into full accord/in all respects emphasizes the primary obligation of complying fully with the letter of the standards.

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[636] "Comply", *Black's Law Dictionary* (online): <https://thelawdictionary.org/comply/>.
[637] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 42.
[638] Chicago Convention, *supra* note 65, art 38 [emphasis added].
[639] *Abu Dhabi Oil Arbitration* (1951), 1 ICLQ (1952) 247 at 252-253.
[640] *North Atlantic Coast Fisheries Case* (1910), 9 RIAA 173 at 180 (Permanent Court of Arbitration). See also VCLT *supra* note 144, art 31. See also Bin Cheng, *General Principles of Law as Applied by International Courts and Tribunals* (Cambridge: Cambridge University Press, 1953) at 107 [hereinafter Cheng, *General Principles of Law*].
[641] For a definition of impracticability, see *Transatlantic Financing Corp. v. United States*, 363 F.2d 312 (D.C. Cir., 1966).

Necessity further specifies how the Convention puts the responsibility of compliance into the hands of States. The State is provided with the right and responsibility of self-judging the necessity of adopting regulations or practices differing from those established by a standard. This necessity clause is an instrument for States to alter their duty to comply with the obligation of following standards without however being in breach of the Convention.[642]

Necessity arises only when "there is an irreconcilable conflict between an essential interest on the one hand and an obligation of the State invoking necessity on the other".[643] In its Commentary on States' responsibility, the ILC defined the "state of necessity" as being:

> the situation of a State whose *sole means* of safeguarding an essential interest threatened by a grave and imminent peril is to adopt conduct not in conformity with what is required of it by an international obligation to another State[644]

In the *Gabcikovo-Nagymaros* Case the International Court of Justice recognizes that:

> the state of necessity is a ground recognized by customary international law for precluding the wrongfulness of an act not in conformity with an international obligation. It observes moreover that *such ground for precluding wrongfulness can only be accepted on an exceptional basis*.[645]

Similarly, the ILC states that:

> the invocation of a state of necessity as a justification [not to conform with an international obligation] *must be considered as really constituting an exception*[646]

The Commission further claims that necessity can exclusively be invoked only if the act is contrary to the State's international obligation:

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[642] Desierto, *Necessity and National Emergency Clauses*, *supra* note 622 at 2-3.
[643] United Nations, *Materials on the Responsibility of States for Internationally Wrongful Acts*, United Nations Legislative Series (New York: 2012) at 167 online: <http://legal.un.org/legislativeseries/documents/Book25/Book25.pdf>.
[644] "Report of the Commission to the General Assembly on the work of its thirty-second session" (UN Doc A/35/10) in *Yearbook of the International Law Commission* 1980, vol II, part 2 (New York: UN, 1981) at 34 para (I) (UNDOC. A/CN4/SER.A/1980/Add. 1 (Part 2)) [emphasis added] [hereinafter "Report of the ILC" YILC 1980, vol II, part 2].
[645] *Gabčíkovo-Nagymaros Project*, *supra* note 399 at 40 para 51 [emphasis added].
[646] "Report of the ILC" YILC 1980, vol II, part 2, *supra* note 644 at 51 para (40) [emphasis added].

"[…] is the *only way* for the State to safeguard an *essential interest* against a grave and *imminent peril*;

[…] does not *seriously impair* an essential interest of the State or States towards which the obligation exists, or of the international community as a whole;" [647]

The States which invoke necessity must not have *contributed* to the occurrence of the state of necessity and the obligation in question does not exclude to invoke it; [648]

According to the IJC, those conditions reflect customary international law, [and the State invoking them] is not the sole judge of whether those conditions have been met".[649] This opens important scenarios on the validity of ICAO audits and on the retaliatory actions which states may take consequently.

The Article 38 escape clause, therefore, takes into account those *exceptional* situations where States may have impediments and are therefore unable to fully comply with or follow the obligation of the articles. The provision therefore:

1) Justifies non-compliance with the primary duty to comply;
2) Prevents breaching the Treaty;
3) Temporarily suspends the duty of compliance so long as the necessity situation stands; should the necessity of non-compliance terminate, *the primary duty of compliance is resumed in full*.

Article 38 provides that in the case of a departure from an amendment of an international standard, the State shall give notification to the Council within 60 days; in all other cases, the article limits itself to specify that a State which finds it impracticable to comply in full or in part with an ICAO standard shall give *immediate* notification to ICAO.[650] At first sight, one may deduce that the duty to immediately notify a full non-compliance with SARPs arises at any moment the State finds it impracticable to comply – i.e. even years after a new SARP is enacted. On the contrary, this thesis sustains that the duty of immediate notification is triggered at the moment the SARP comes into effect,

[647] ILC, Articles on State Responsibility, *supra* note 298, art 25 [emphasis added].
[648] *Ibid*.
[649] *Gabčíkovo-Nagymaros Project, supra* note 399 at 40 para 51.
[650] Chicago Convention, *supra* note 65, art 38 [emphasis added].

or from the date on which States are notified of its adoption under Article 90(b).[651] According to Professor Dempsey, it would in fact not make sense that a State could have "an open window *ad infinitum* to opt out for any newly promulgated SARP, and only a sixty-day opt out period for any amendment thereto".[652] The phrasing of article 38 could only mean that a State which finds it impracticable to comply shall "immediately so notify the Council upon being notified that a SARP has been adopted by it".[653]

In both notification cases, once the Council is made aware of the non-compliance, it shall immediately notify "all other States of the difference which exists between one or more features of an international standard and the corresponding national practice of that State".[654]

The combined reading of Articles 37 and 38 therefore provides a hierarchy of obligations which follow a different force of logic:

1) The primary obligation is to comply with a standard;
2) Subsidiary to the primary obligation, the obligation to notify the Council (either immediately upon a standard adoption or within 60 days from the adoption of an amendment) should it be *impossible* to comply with the letter of the Annex or part of it;
3) There is a further subsidiary obligation to abide by a standard should the State decide not to notify ICAO of any difference.[655]

In either case a State obligation arises consequently to the adoption or modification of an Annex or part thereof.

1.6 *Pacta sunt servanda*

Considering the very limited application of the *state of necessity* or the exceptionality of being in a condition of *impracticability* and taking into account the object and purpose of the treaty, one may conclude that the expectation of State parties is the full compliance with standards. The treaty therefore

[651] *Ibid*, art 90 (b).
[652] Dempsey, *Public International Air Law, supra* note 18 at 102.
[653] *Ibid.*
[654] Chicago Convention, *supra* note 65, art 38.
[655] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 59-60.

provides for an underlying obligation of cooperation upon all States, which necessitates good faith by all parties of the international community. Each party, therefore, places its "entire confidence in the good faith of the other".[656]

Article 31 of the VCLT provides that:

> A treaty shall be interpreted in *good faith* in accordance with the ordinary meaning to be given to the terms of the treaty in their context and in the light of its object and purpose.[657]

Therefore, in order to fulfil an obligation in good faith, it is first necessary to identify it in good faith,[658] which means the honest and loyal respect of the scope of the treaty and not the mere fulfillment of its literal meaning: treaties ought to be interpreted according to their spirit.[659] Interpreting in good faith may also imply "running counter to the literal terms of an isolated phrase, which read in connection with its context is susceptible of a different construction".[660] When interpreting a treaty, the purpose, values, legal, social and economic goals, and that which its provisions aim to achieve shall be taken into account.[661] In the case concerning the *Gabcikovo-Nagymaros Project Case,* the IJC concluded that:

> it is the purpose of the Treaty, and the intentions of the parties in concluding it, which should prevail over its literal application. The principle of good faith obliges the Parties to apply it in a reasonable way and in such a manner that its purpose can be realized. [662]

The principle of *good faith*, already codified in Article 2(2) of the UN Charter and the Friendly Relations Declaration,[663] is, as held by the Arbitral Tribunal of the *Megalidis Case*, at "the foundation

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[656] *Sartori v Peru* (1863), 29 RIAA 91 at 95 (Mixed Commission of Peru and the United States of America established under the Convention of 12 January 1863).
[657] VCLT, *supra* note 144, art 31 [emphasis added].
[658] Cheng, *General Principles of Law*, *supra* note 640 at 115.
[659] *Boundaries in the Island of Timor (Netherlands v. Portugal)* (1914), PCA at 7 (Permanent Court of Arbitration), citing Rivier, *Principes du droit des gens*, II, No. 157.
[660] *Paula Mendel and Others (United States) v Germany* (1926) RIAA 372 at 385.
[661] Cheng, *General Principles of Law, supra* note 640 at 114 -119.
[662] *Gabčíkovo-Nagymaros Project, supra* note 399 at 79 para 142.
[663] UN Charter, *supra* note 66, art 2(2); see also *Declaration on Principles of International Law concerning Friendly Relations and Co-operation among States in accordance with the Charter of the United Nations,* GA Res 2625 (XXV), UNGAOR, 25th Sess, UN Doc A/8018 (1970).

of all law and conventions".[664] It governs treaties from the time of their formation to their extinction,[665] and without it, international law would be a "mockery".[666]

In the *Nuclear Tests Case*, the ICJ held that:

> One of the basic principles governing the creation and performance of legal obligations, whatever their source, is the principle of good faith. Trust and confidence are inherent in international co-operation, in particular in an age when this co-operation in many fields is becoming increasingly essential.[667]

Good faith is the very foundation of the *pacta sunt servanda* principle. Parties to a treaty are expected to willingly commit to its content, which means that "their will must produce the effects [they have] openly sought, and they must be considered effectively bound, in accordance with their declarations"[668]
Article 26 of the VCLT states that:

> Every treaty in force is *binding* upon the parties to it and must be performed by them in *good faith*.[669]

Therefore, a party to a treaty cannot simply free himself from the obligations arising from it,[670] "[a]s long as […] [a] Treaty remains in force, it must be observed as it stands".[671] A party cannot invoke the provisions of its internal law as justification for its failure to perform its treaty obligations.[672] Non-compliance with a treaty, in fact, even when it is reciprocal, does not terminate the agreement.[673]

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[664] *Megalidis v. Turkey* (1928) 8 MAT 386 at 395 (Turkish-Greek Mixed Arbitral Tribunal).
[665] Cheng, *General principles of Law*, *supra* note 640 at 106; See also VCLT, *supra* note 144, art 18;
In these regards, Bedjaoui in *Guinea-Bissau v Senegal*: "Ratification represents a final and definitive commitment which, in all good faith, makes it incumbent upon the two States to consider themselves bound with respect to each other by the Convention". See *Case Concerning the Arbitral Award of 31 July 1989* (1989), 83 ILR 1 at 86 para 80 (Arbitration Tribunal for the Determination of the Maritime Boundary).
[666] Mixed Claims Commission United States-Venezuela (1903) 9 RIAA 113 at 255
[667] *Nuclear Tests*, supra note 395 at 268 para 46.
[668] Markus Kotzur, "Good Faith (Bona fide)", *Max Planck Encyclopedia of Public International Law [MPEPIL],* (online) C, at 19.
[669] VCLT, *supra* note 144, art 26 [emphasis added].
[670] Cheng, *General Principles of Law, supra* note 640 at 113
[671] *The Diversion of Water from the Meuse* (1937), SO by Altimira, PCIJ (Ser A/B) No 70 at 43.
[672] VCLT, *supra* note 144, art 27. See also *Fisheries Case*, *supra* note 406 at 181.
[673] *Gabčíkovo-Nagymaros Project, supra* note 399 at 68 para 114.

In the *Gabčíkovo-Nagymaros Project* Case, the IJC stated that there would be:

> disturbing implications for treaty relations and the integrity of the rule *puctu sunt servunda* if it were to conclude that a treaty in force between States, which the parties have implemented in considerable measure and at great cost over a period of years, might be unilaterally set aside on grounds of reciprocal non-compliance.[674]

The violation of a treaty obligation constitutes an internationally wrongful act that renders the State pursuing it internationally responsible[675] and obliges it, first, to offer "appropriate assurances and guarantees of non-repetition",[676] and second, to make full reparation for the injury (including material or moral damage) caused by the internationally wrongful act.[677] As Jakhu, Freeland & Chen note:

> Even if no damage or injury results from the non-observation of the […] obligations, strictly speaking non-observing States would still entail international responsibility.[678]

Good faith requires a genuine effort to fulfill the substance of the agreement,[679] and the corollary of this principle is that of the *abuse of rights*. The clearest example of this concept is provided in the United Nations Convention on the Law of the Sea, which stipulates that:

> States Parties shall fulfil in good faith the obligations assumed under this Convention and shall exercise the rights, jurisdiction and freedoms recognized in this Convention in a manner which would not constitute an abuse of right.[680]

One party cannot evade its obligations by "indirect means" such as through exaggerating the exercise of its rights flowing from the agreement,[681] *such as abusing of the escape clause of Article 38 of the*

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[674] *Ibid.*
[675] ILC, Articles on State Responsibility, *supra* note 298, arts 1, 2, 12.
[676] *Ibid*, art 30.
[677] *Ibid,* art 31.
[678] Jakhu et al., "The Sources of International Space Law"*, supra* note 612 at 619.
[679] Cheng, *General Principles of Law, supra* note 640 at 118
[680] UNCLOS, *supra* note 197, art 300.
[681] Cheng, *General Principles of Law, supra* note 640 at 122-123.

Chicago Convention, because it constitutes an abuse of right and therefore a breach of the agreement itself.[682]

When a State does not immediately notify the differences – according to Article 38 – not only does it breach an obligation of the Convention, it also precludes other States from being aware of the extent of compliance of other Parties to the Convention. The *bona fide* reliance on the unambiguous representation of a State entitles the relying State to reparation should anything happen to them as a result of such a faux representation.[683] This principle is also known as *estoppel* and it precludes a State from asserting something contrary to what is implied by a previous action or statement (or by a previous pertinent judicial determination).[684] Estoppel is a general principle of law, founded on the principles of good faith and consistency.[685] In public international law, "the doctrine of estoppel protects legitimate expectations of States induced by the conduct of another State".[686] In the case concerning the Temple of Preah Vihear, Judge Alfaro declared that:

> inconsistency between claims or allegations put forward by a State, and its previous conduct in connection therewith, is not admissible[687]

This reflects the Roman principles of *non licet venire contra factum proprium*[688] and of *allegans contraria non audiendus est.*[689]

In the Chagos Marine Protected Area arbitration, the tribunal observed that "[t]he principle [of estoppel] stems from the general requirement that States act in their mutual relations in good faith and is designed to protect the legitimate expectations of a State that acts in reliance upon the representations of another".[690] And that:

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[682] For a broad picture of the abuse of right, *Ibid* at 121 and ss.
[683] See Thomas Cottier and Jörg Paul Müller, "Estoppel", *Max Planck Encyclopedia on International Law [MPEI],* (2007) [hereinafter Cottier & Müller, "Estoppel"].
[684] Cheng, *General Principles of Law, supra* note 640 at 143-144.
[685] Brownlie, *Principles of Public International Law*, *supra* note 565 at 616; See also PAN Kaijun, "A Re-Examination of Estoppel in International Jurisprudence" (2017) 16 Chinese J of Int'l L 751 [hereinafter Kaijun, "A Re-Examination"]. See also *North Sea Continental Shelf (Germany v. Denmark)*, [1969] ICJ Rep 3 at 26 para 30.
[686] Cottier & Müller, "Estoppel", *supra* note 683 at 1.1.
[687] *Case concerning the Temple of Preah Vihear* (*Cambodia v. Thailand*), Separate Opinion of Vice-President Alfaro, [1962] ICJ Rep 6 at 40.
[688] "No one may set himself in contradiction to his own previous conduct".
[689] "Contradictory statements will not be listened to".
[690] *Chagos Marine Protected Area Arbitration (Mauritius v UK)* (2015), PCA at 172 para 435 (Permanent Court of Arbitration).

> estoppel may be invoked where (a) a State has made clear and consistent representations, by word, conduct, or *silence*; […] (c) the State invoking estoppel was induced by such representations to act to its detriment, to suffer a prejudice […]; and (d) such reliance was legitimate, as the representation was one on which the State was entitled to rely.[691]

In *ELSI* the ICJ asserted that "it cannot be excluded that an estoppel could in certain circumstances arise from a silence when something ought to have been said".[692]

To regard good faith as the sole foundation of estoppel would mean that a State acting in good faith would be accountable for any legitimate expectation of other States. This would either impose an unreasonable burden upon the representing State or raise higher the standard of "legitimate expectation".[693] Estoppel is indeed mitigated by the principle of equity which may outweigh the principle of good faith in (usually exceptional but) legitimate cases.[694]

Every right protects a legitimate interest, and so does the right of departure from Article 38. From this perspective, the exercise of the right of departing or deviating from the standard shall be based on the *bona fide* evaluation of the impossibility of compliance, and that decision of departing from the obligation contained in a standard should be made by taking into account the obligation to achieve uniformity to the greatest extent possible. When a treaty leaves a matter to the judgment of the State, as in the case of the provision of Article 38, such discretion must be exercised honestly and in accordance with the spirit of the treaty and in such a manner as not to prejudice the interests of the other contracting parties.[695] Any fictitious exercise for the purpose of evading a treaty obligation is an unlawful abuse.[696] Only within these strict boundaries does Article 38's right of departure protect the legitimate interest of the State which cannot be held responsible for the impossibility of compliance. Such an escape clause constitutes part of the innovative character of the Chicago Convention. Derogation is per definition a right accorded by the treaty to its parties to depart, under certain circumstances, from a specific obligation provided by the treaty. Therefore, it can be considered as an

[691] *Ibid* at 174 para 438 [emphasis added].
[692] *Elettronica Sicula S.p.A. (ELSI) (US v. Italy),* [1989] ICJ Rep 15 at 44 para 54.
[693] Kaijun, "A Re-Examination", *supra* note 685 at 758.
[694] *Ibid* at 759.
[695] *North Atlantic Coast Fisheries Case, supra* note 640 at 180.
[696] Cheng, *General Principles of Law, supra* note 640 at 123.

exception to a specific obligation. There cannot be derogation without a primary obligation to comply. It is therefore a *privilege* to abstain fully from or partially abiding with an obligation.

Some conclusions can be drawn from the above. A notification of departure that it is not immediate with regards to a new SARP or that it is not within the prescribed 60 days in the case of amendment thereto may result in an abuse of right. *Therefore, if no information is received immediately or within 60 days, States are to be considered fully compliant with the Convention*.[697]
In any event, even when the departure is made within the terms established, the subjective judgement must be done in good faith. Further, the departure from the norm does not imply its dissolution; on the contrary, the obligation remains in full effect, and should the condition leading to the determination of the necessity to derogate dissolve, there is an obligation of full compliance. Lastly, partial derogation implies that the rest of the obligation not covered by the derogation shall be abided by. As mentioned before, good faith implies serious efforts to achieve compliance and that all possible (and reasonable) venues are exhausted before invoking the departure right.[698] This raises the question of how to prove/judge that the State under an obligation has made efforts to achieve compliance and exhausted all venues to achieve compliance.

As seen below, ICAO in its audit has recently established that non-compliant States must also provide the reasons. Therefore, although it is difficult to provide a judgement over a subjective consideration, it would be easier to do so considering what objectively has been provided as justification. The reasons of departure that the non-compliant State provides could be used by the other States' parties as justification for actions against the non-compliant one, further reinforcing, as seen below, the enforcement mechanism of the ICAO system.

1.7 Practices of ICAO and of prominent air-faring states: non-compliance? "Name and shame"

Prior to deepening the discussion on those mechanisms, it is important to remember that civil aviation is an essential component of any solid economy; aviation is a major contributor to it.[699] The air transport industry supports more than 63 million jobs and involves more than US $2.7 trillion in global

[697] ICAO, Minutes of the Council, ICAO Doc 9486-C/1095 C-Min 118/8, 59-60 and 118/15; see also ICAO, Minutes of the Council, (1950) ICAO Doc 7037-3 C-814-3; see also ICAO, Minutes of the Council, ICAO Doc 9484-C/1093 C-Min 117/20.
[698] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 61.
[699] Demspey, *Public International Air Law, supra* note 18 at 2.

GDP.[700] A third of all global trade by value is sent by air, making aviation a key component in global business.[701] Aviation fosters economic growth, creates jobs, and intensifies international trade and tourism.[702] Further, it is an enabler of other industries and of social benefits, such as education, health, etc.[703] The world's economies will become increasingly more dependent on international trade supported by aviation over the next decade:[704] *a country that is excluded from the global aviation network has no chance to foster its own.*

Technical regulations in the Annexes are founded on the concept of State cooperation to secure the uniform extension and application of such rules in all national jurisdictions and to ensure safety.[705] Nevertheless, the Convention does not provide a direct sanction should a State fail to respect its duty of immediate notification of any standard departure: does this further imply a theory of the non-binding nature of standards?

Lack of enforcement constitutes a precise choice that emerged during the *travaux preparatoires* in which the Committee on Technical Standards and Procedures rejected the hypothesis of providing ICAO enforcement powers such as those of ICAN because that would have hindered the willingness of States to ratify the Convention.[706] Not accepting to vest an international organization with lawmaking authority was, for example, the reason why the United States did not ratify the Paris Convention.[707] The fact that ICAO has no enforcement jurisdiction does not signify that States are free not to comply with standards. On the contrary, the Convention, as argued below, shifts the implementing and enforcement responsibilities onto States.

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[700] World Bank Group, *Air Transport Global Report* (2016) at 1, online: <http://documents.worldbank.org/curated/en/364321491414311301/pdf/114059-AR-PUBLIC-ADD-SERIES-73p-AFTP4-2016-FYAirTransportAnnualReport.pdf>.
[701] ICAO, *2016-2030 Global Air Navigation Plan (GANP),* 5th ed (2016) ICAO Doc 9750-AN/963 at 6 [hereinafter ICAO, GANP 2016].
[702] Air Transport Action Group, "Economic Growth", *Aviation Benefits Beyond Borders* (online): <https://www.aviationbenefits.org/economic-growth/>. See also IATA, "Fact Sheet", *Aviation Benefits Beyond Borders* (online): <www.iata.org/pressroom/facts_figures/fact_sheets/Documents/fact-sheet-economic-and-social-benefits-of-air-transport.pdf>.
[703] *Ibid.*
[704] ICAO, GANP 2016, *supra* note 701 at 6.
[705] Chicago Convention, *supra* note 65, Preamble.
[706] For a broad perspective see *Proceedings, supra* note 62 at Vol I, Part II, Committee II, Washington DC: GPO, 1948, 700 and *ss*.
[707] Dempsey, *Public International Air Law, supra* note 18 at 23.

Safety oversight may be defined as the "function by which States ensure effective implementation of the safety-related Standards and recommended Practices (SARPs) and associated procedures contained in the annexes […]".[708] As part of the recognition of State sovereignty, the responsibility of safety oversight rests first and foremost with the Contracting States. According to ICAO Assembly resolution A29-13: "individual State's responsibility for safety oversight is one of the tenets of the Convention".[709]

The exercise of this responsibility finds its jurisdictional basis in the aircraft registration/nationality, which may be transferred within the limits of Article 83*bis*, and in the territorial jurisdiction of the relevant State. Nevertheless, the Convention does not provide for a direct mechanism of guaranteeing the verification of the status of the implementation by Member States.

In 1995, in fact, the ICAO Secretariat acknowledged the impossibility "to indicate with any degree of accuracy or certainty what the state of implementation of regulatory Annex material really is".[710] By that year, the Convention mechanism of State cooperation and mutual trust was placed in danger due to missing notifications of non-compliance by States.[711] Dr. Saba identifies four reasons for State failure to comply with their obligations arising from the Convention Annexes:

> 1 Primary aviation legislation and regulations may be either non-existent or inadequate (for example, a failure to provide adequate enforcement powers);
>
> 2 Institutional structures that regulate and supervise aviation safety often do not have the authority and/or autonomy to effectively satisfy their regulatory duties;

[708] ICAO, *Safety Oversight Manual*, ICAO Doc. 9734, AN/959, 2nd ed (2006) at Part A, "The establishment and Management of State's Safety Oversight System" para 2.1.1.
[709] ICAO, *Assembly Resolution in Force (as of 8 October 2004)*, ICAO Doc. 9848 at I-56.
[710] Michael Milde, "Enforcement of Aviation Safety Standards: Problems of Safety Oversight" (1996) 45:1 ZL W Jg 3 at 8-9. Citing ICAO Council Working Paper C-WP/10218 at para 4.9.
[711] Dempsey, *Public International Air Law, supra* note 18 at 108; Professor Dempsey, on this topic, reports an important observation of Professor Milde: "[T]he vast law-making work of the Council in the drafting of the [SARPs] represents the most visible and monumental achievement of ICAO during its existence, contributing significantly to safe and orderly air navigation. However, the real and effective level of implementation of [SARPs] by the contracting States on a global level is a matter of grave concern and doubt". Michael Milde, "The Chicago Convention – Are Major Amendments Necessary or Desirable 50 Years Later?" (1994) XIX Ann Air & Sp L 401 at 425-426.

3 Human resources in many States may be plagued by a lack of appropriate expertise largely due to inadequate funding and training (and trained staff may leave government jobs for better-paying jobs in the aviation industry);

4 Financial resources allocated to civil aviation safety are insufficient since many developing countries do not consider this a high priority compared to other demands such as health care, education, irrigation, and poverty.[712]

Indeed, as Professor Dempsey notes:

> Most [States' parties] do not exercise their right to object, either because they agree to the standards imposed upon them, or because their transport or foreign ministries lack a sophisticated understanding of the obligations to which they have been subjected, or of their duty to notify ICAO of the impracticability of compliance.[713]

Clearly the law-making function of ICAO is not enough, per se, to prevent harm to commercial aviation caused by the lack of compliance, and an explicit mechanism to ensure the enforcement of States' obligations is not clearly ascribed as part of ICAO powers. Although this lack of express power may be seen as a "basic criticism,"[714] as mentioned below, it constitutes one aspect of the modernity of the Convention and of its successful ratification.

1.7.1 IASA program

In 1992, the US took unilateral actions to ensure compliance with ICAO aviation safety standards, and the International Aviation Safety Assessment (IASA) Program was established[715] "with the purpose of ensuring that all foreign air carriers operating to or from the US, or codesharing with a US carrier, are properly certificated and subject to safety oversight provided by a competent Civil Aviation Authority (CAA) in accordance with ICAO standards".[716] Under the program, the FAA is tasked to

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[712] John Saba, "Worldwide Safe Flight: Will the International Financial Facility for Aviation Safety Help It Happen?" (2003) 68 J Air L & Com 537 at 545.
[713] Dempsey, *Public International Air Law, supra* note 18 at 103.
[714] Javad Jalali, *The Impact of Sanctions upon Civil Aviation Safety*, thesis (Montreal: McGill University, Faculty of Law, Institute of Air and Space Law, 2011) at 1 [hereinafter Jalali, *The Impact of Sanctions*].
[715] The IASA Program was formally established in the Federal Register, Vol. 57, No. 164, August 24, 1992.
[716] FAA, "IASA Program Overview", online: <https://www.faa.gov/about/initiatives/iasa/media/FAA_Initiatives_IASA.pdf>.

establish the compliance of such States;[717] therefore, the program focuses on a State's ability, and not on the ability of individual air carriers, to adhere to the standards contained in Annexes 1, 6 and 8.[718] States are assigned into categories, compliant or non-compliant; with the consequence that non-compliant States are banned from flying over, to, or from, US territory.[719]

One may object that, under international law, unilaterally inflicting costs on another State's economy, even indirectly, such as by boycotting the aviation of another State, could constitute a coercive measure in international relations.[720] In the words of Daniel W. Drezner, in fact, economic coercion is:

> [t]he threat or act by a nation-State or coalition of nation-States, called the sender, to disrupt economic exchange with another nation-State, called the target, unless the targeted country acquiesces to an articulated political demand.[721]

However, the grounds for banning non-compliant States lies with the Chicago Convention itself. Article 1 states that every State has "complete and exclusive sovereignty over the airspace above its territory", and Article 6 states that commercial operation in another State's airspace are prohibited unless authorized by the overflown State. Under Article 33, States parties may refuse to acknowledge the validity of the Certificates of Airworthiness issued by any State which does not abide by the minimum standards set by the Convention, and may therefore ban its aircraft from their skies, even if traffic rights have been conferred pursuant to Article 6.[722] The FAA publication of the list of compliant and non-compliant States, respectively categorized in Category I and II, has severely impacted the aviation industry and economy of non-compliant States.[723]

However, being scrutinized exclusively by a single country did not appeal to many States, which have claimed a lack of impartiality in this.[724] Further, a collective will against undesirable behaviors on the

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[717] International Aviation Safety Assessment (IASA) Program, "FAA Flight Standards Service" (online, August 2018): <https://www.faa.gov/about/initiatives/iasa/media/IASAWS.xlsx>.
[718] *Ibid*.
[719] *Ibid.*
[720] Jalali, *The Impact of Sanctions*, *supra* note 714 at 13.
[721] Daniel W Drezner, *The Sanctions Paradox* (Cambridge: Cambridge University Press, 1999) at 2.
[722] Dempsey, *Public International Air Law*, *supra* note 18 at 98. Professor Dempsey sustains that art 33 trumps art 6: "in the context of safety, article 33 would take precedence, as it is located in Chapter V of the Chicago Convention", "Conditions to Be Fulfilled with Respect to Aircraft" see Dempsey, *Public International Air Law*, *supra* note 18 at 107.
[723] *Ibid* at 119.
[724] Michael B Jennison, "The Chicago Convention and Safety After 50 Years" (1995) 20:2 Ann Air & Sp L 283 at 291-297.

international stage would have a stronger impact in affirming the mandatory nature of standards within the terms expressed above in this chapter.[725] This is why the US initiative indirectly pushed for the establishment of a multilateral monitoring regime within ICAO.[726]

1.7.2 EU banning program

Differently from the US, which blacklists States on the basis of FAA inspections of SARP compliance, the EU, through Regulation (EC) No 2111/2005, allows the banning of certain foreign carriers that do not meet the "relevant safety standards" defined as "the international safety standards contained in the Chicago Convention and its Annexes as well as, where applicable, those in relevant Community law".[727] This Regulation is clearly against Article 33 of the Chicago Convention as it legitimizes the banning of a carrier from European skies which does not meet the safety standards in relevant Community law even if the carrier meets the requirements of the Chicago Convention and its Annexes. One should, indeed, note that though the EU itself is not a party to the Chicago Convention, its members are, irrespective of whether they comply with "relevant Community law".
As a result of these unilateral programs, the international community has been more motivated to ascribe the function of overseeing compliance with ICAO standards to ICAO itself.[728]

1.7.3 ICAO monitoring of compliance

Article 55 *e)* of the Chicago Convention gives the Council the authority to investigate "any situation which may appear to present avoidable obstacles to the development of international air navigation"[729]. On these grounds, following the Assembly Resolution A29-13 in 1992,[730] the ICAO Council, in 1995, approved the safety oversight voluntary assessment program to assess State compliance with

[725] Jalali, *The Impact of Sanctions*, *supra* note 714 at 38-39.
[726] Anthony Broderick & James Loos, "Government Aviation Safety Oversight – Trust, But Verify" (2002) 67 J Air L & Com 1035 at 1043.
[727] EC, *Regulation (Ec) No 2111/2005 of the European Parliament and of the Council of 14 December 2005 on the establishment of a Community list of air carriers subject to an operating ban within the Community and on informing air transport passengers of the identity of the operating air carrier, and repealing Article 9 of Directive 2004/36/EC*, [2005] OJ, L 334/15, art 2j.
[728] To deepen this argument, see Dempsey, *Public International Air Law, supra* note 18 at 121 ss.
[729] Chicago Convention, *supra* note 65, art 55 *e)*.
[730] ICAO, *Improvement of Safety Oversight*, Res A29-13 (1992), ICAO Doc 9602 at I-39.

SARPs.[731] The voluntary adherence of States to the program justified ICAO's reticence to publicize the delinquent States so as to avoid those States' fear of being publicly shamed and thus resist the voluntary program. Nevertheless, because under Article 54, the Council shall:

> (*j*) Report to Contracting States any infraction of this Convention, as well as any failure to carry out recommendations or determinations of the Council;
>
> (*k*) Report to the Assembly any infraction of this Convention where a Contracting State has failed to take appropriate action within a reasonable time after notice of the infraction;[732]

And because under article 38 the Council shall:

> make immediate notification to all other states of the difference which exists between one or more features of an international standard and the corresponding national practice of […] [the non-compliant] State[733]

the non-sharing of information constituted a violation of the treaty itself by one of the ICAO organs.

Such an initially unstable situation has led to a series of progressive changes.[734] In 1998, the voluntary assessment program was replaced by a *mandatory* Universal Safety Oversight Audit Programme (USOAP) with resolution A32-11.[735] Under USOAP, States are regularly audited and their safety oversight capability and level of SARP implementation is assessed.[736] The determination of a State's compliance with SARPs, associated procedures, and guidance material[737] is made through the following eight audits:

> 1) primary aviation legislation and civil aviation regulations (LEG);

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[731] ICAO, "ICAO Universal Safety Oversight Audit Programme / USOAP", (Presentation delivered at the ATM Safety Management System Auditors Seminar for CAR/SAM Regions, Mexico City, Mexico, 05-09 December 2005) at slide 7, online: <https://www.icao.int/Meetings/AMC/MA/2005/ATM_safety/session5icao.pdf>.
[732] Chicago Convention, *supra* note 65, art 54 *j)* and *k).*
[733] *Ibid*, art 38.
[734] In 1997, the *Directors General of Civil Aviation Conference* (DGCA Conference) *on a Global Strategy for Safety Oversight*, recommended the transition towards a *mandatory* and *transparent* safety audits. See ICAO, *Directors General of Civil Aviation Conference on a Global Strategy for Safety Oversight*, Report (1997), ICAO Doc 9707 at 2-5 [hereinafter ICAO, *Directors General Conference*].
[735] ICAO, *Establishment of an ICAO Universal Safety Oversight Audit Programme*, Res A32-11 (1998) at 1, ICAO Doc 9790 at I-53.
[736] ICAO, "Safety Compliance and Verification", *FAQ about USOAP,* online: ICAO <https://www.icao.int/safety/CMAForum/Pages/FAQ.aspx>.
[737] *Ibid*.

2) civil aviation organization (ORG);

3) personnel licensing and training (PEL);

4) aircraft operations (OPS);

5) airworthiness of aircraft (AIR);

6) aircraft accident and incident investigation (AIG);

7) air navigation services (ANS); and

8) aerodromes and ground aids (AGA).[738]

Another important evolutionary aspect of the ICAO audit program is that while the first cycle focused only on Annexes 1, 6 and 8, the scope of the audit was further broadened by the Assembly Resolution A35-6 to all the safety provisions contained in all the safety-related Annexes,[739] through a Comprehensive Systems Approach (CSA).[740] This is an important achievement because it greatly broadens the area of action. The same resolution mandated the Secretary General to disclose the audit results to all Members States via a secure website.[741] In 2005, the Council approved a disclosure procedure[742] which was, however, limited to significant deficiencies.[743] In 2006, 153 of 190 Member States agreed that by 23 March 2008, the States that fail to agree to *full transparency* of their USOAP audits should be posted.[744] On July 16, 2008, all audited member states gave consent to post the audit

[738] ICAO, *Universal Safety Oversight Audit Programme Continuous Monitoring Manual*, ICAO Doc 9735 AN/960 at 2-4 para 2.4.
[739] ICAO, *Transition to a Safety Oversight audit Program*, ICAO Doc A32-WP/6 (1998). See also ICAO, *Transition to a comprehensive systems approach for audits in the ICAO Universal Safety Oversight Audit Programme (USOAP),* Res A35-6 (2004) at 2, ICAO Doc 9902 at I-87.
[740] *Ibid* at I-88.
[741] *Ibid*.
[742] ICAO Council, *Summary Minutes of the Thirteenth Meeting*, 175th Sess, No 14.5: Safety Oversight, ICAO Doc C-MIN 175/13 (2005) at para 44. See also Jimena Blumenkron, *Implications of Transparency in The International Civil Aviation Organization's Universal Safety Oversight Audit Programme*, McGill Faculty of Law IASL, (2009) at 49 [hereinafter Jimena Blumenkron, *Implications Of Transparency*].
[743] ICAO Council, *Procedure of Transparency and Disclosure*, 174th Sess, No 14.5: Safety Oversight, ICAO Doc C-WP/12497 (2005). See also Jimena Blumenkron, *Implications of Transparency*, supra note 742 at 48.
[744] ICAO Council, *Summary of Decisions*, 178th Sess, 1st Mtg, No 14.5: Outcome of the Directors General of Civil Aviation Conference on a Global Strategy for Aviation Safety 2006, ICAO Doc C-DEC 178/1 (2006) at para 26, d. See also Dempsey, *Public International Air Law, supra* note 18 at 134.

results.[745] As of December 2017, the result of 185 States, which represent 96% of all Member States covering 99% of all international air traffic,"[746] are published. [747]

At the 36th ICAO Assembly, Resolution A36-4 directed the Council to develop a new audit methodology "based on the concept of continues monitoring".[748] In January 2013, the USOAP Continuous Monitoring Approach (CMA) was fully launched.[749] Under this new approach, cyclical audits are supplemented with a *continuous* process of gathering safety information, providing a continuous report of a State's effective implementation of Standards.[750]

ICAO's USOAP constitutes a name-and-shame system that heavily pushes States to comply with ICAO standards and which further justifies the compliant to blacklist those who are not. Such a system may be identified as an indirect enforcement mechanism to ensure compliance of States with the norms of obligatory nature: standards.

1.7.4 Legal nature of ICAO audits

Professor Weber recognizes that the ICAO Audit programs have provided certainty to the effort towards the establishment of the effectiveness of a new aviation safety regime.[751] Indeed, the success of the programs ought to be seen in their regular, mandatory, systematic, and harmonized nature.[752] But how is it possible that programs that were originally designed as voluntary assessments of an individual State's implementation of SARPs and that provided for the disclosure of a report only to

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[745] ICAO, "All Audited States now authorize ICAO to post audit results on public website", online: ICAO <http://www.icao.int/ icao/en/nr/2008/pio200804_e.pdf>.

[746] ICAO, "Safety Compliance and Verification", *FAQ about USOAP*, online: ICAO <https://www.icao.int/safety/CMAForum/Pages/FAQ.aspx> [hereinafter ICAO, "Safety Compliance and Verification"]. Note further that the Continuous Monitoring and Oversight (CMO) Section of the International Civil Aviation Organization (ICAO) has been recertified to the ISO 9001:2008 standard for quality management systems. It is the first Section within ICAO, and one of the very few within the United Nations, to receive such compliance see ICAO, "ICAO Universal Safety Oversight Audit Programme Recertified to ISO 9001:2008", online: ICAO <https://www.icao.int/Newsroom/Pages/ICAO-Universal-Safety-Oversight-Audit-Programme-Recertified-to-ISO-9001-2008.aspx>.

[747] ICAO, "Safety Audit Results: USOAP interactive viewer", online: ICAO <https://www.icao.int/safety/pages/usoap-results.aspx>.

[748] ICAO, *Application of a continuous monitoring approach for the ICAO Universal Safety Oversight Audit Programme (USOAP) beyond 2010*, Res A36-4 at 3 (2007), ICAO Doc 9902 at I-96.

[749] ICAO, "Welcome to the USOAP Continuous Monitoring Approach (CMA) website" online: ICAO <https://www.icao.int/safety/CMAForum/Pages/default.aspx>.

[750] ICAO, "Safety Compliance and Verification", *supra* note 746.

[751] Ludwig Weber, "Convention on International Civil Aviation – 60 Years" (2004) 53:3 Jg. ZLW 289 at 304.

[752] *Ibid*.

the assessed State became a system that is public and mandatory? How is it possible that Sates are bound to submit themselves to a continuous audit program that is not even provided for under the Convention?

In the words of Dr. Huang:

> one may venture to conclude that the ICAO audit practice has customarily developed into a *mandatory* safety regime in the true legal sense of the word.[753]

To understand how a practice has developed into a norm of customary international law, it is essential to analyze some key passages pertaining to the formation of these programs and to verify their legal value and basis within the theory and practices of international law.

The establishment of the safety audit program has essentially passed through three decision-making stages:

1) A recommendation from a Conference of States;
2) The endorsement of such recommendation by the Assembly with a unanimous resolution;
3) Conclusion of bilateral ICAO-State memoranda complemented by various decisions of the Council.[754]

The establishing of the security audit program was even faster:

1) The Assembly requested the establishment of the program through Resolution A33-1.[755]
2) The Assembly endorsed the program as established by the Council with Resolution A35-9.[756]

When the Safety Oversight Assessment Program was approved by the Council in 1995 and subsequently endorsed by the Assembly in its 31st session, this was clearly a voluntary program, and the assessment results were only provided to the respective assessed States.[757] The other Contracting States were just provided with a summary of the assessment. Only after the validity of the voluntary nature of the assessment program was questioned by the representative of Senegal at the 151st session of the Council of June 1997, did the mandatory nature of the program become the focus of serious

[753] Huang, *Aviation Safety through the Rule of Law*, *supra* note 538 at 75-76.
[754] *Ibid* at 80.
[755] ICAO, *Declaration on misuse of civil aircraft as weapons of destruction and other terrorist acts involving civil aviation*, Res A33-1 (2001) at 7 and 8, ICAO Doc 9848 at VII-I – VII-II.
[756] ICAO, *Consolidated statement of continuing ICAO policies related to the safeguarding of international civil aviation against acts of unlawful interference*, Res A35-9 (2004) at Appendix E, ICAO Doc 9848 at VII-6 – VII-7.
[757] Huang, *Aviation Safety through the Rule of Law*, *supra* note 538 at 73; See also ICAO, *Safety Oversight Audit Manual*, 2nd ed (2006), ICAO Doc 9735 AN/960 at 2.1.1.

attention. On this point the ICAO Legal Bureau expressed the opinion that the principle of sovereignty of the Convention can only allow ICAO to carry out such an audit with a State's consent. To overcome such an issue, it was suggested that an Assembly resolution approving the audit program and supported by apposite bilateral expression of consent between the State concerned and ICAO would constitute a solid legal basis for the program.[758] During the 1997 Director General of Civil Aviation (DGCA) Conference, delegates were in favor of "regular, systematic and mandatory safety audits", which the conference formulated in a recommendation that the Assembly *unanimously* endorsed in Resolution A32-11.[759] This Resolution constitutes the milestone from which the actual mandatory nature of ICAO audits originates. It has, in fact, provided grounds for the establishment of a rule and evidence of an *opinio juris*[760]:

> [The] ultimate responsibility for safety oversight rests with contracting States, who shall continuously review their respective safety oversight capabilities.[761]

This responsibility has been consistently reaffirmed in various ICAO Assembly resolutions with no objection ever recorded.[762]

Although A32-11 has provided for the State's consent to be subjected to audit by the signing of a Memoranda, in practice such consent has progressively disappeared as a basis for auditing. The risk of refusing an ICAO audit it is, in fact, so great that no state has objected to one. Such rigorous compliance, according to Dr. Huang, has brought the nature of the memoranda to a "mere formality", overcome by the commitment of each State to respect the whole community's expectations.[763] The establishment of the USOAP and USAP programs has definitely consolidated the development of the ICAO audit practice into a customary mandatory safety regime.[764]

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[758] Huang, *Aviation Safety through the Rule of Law*, *supra* note 538 at 73-74; See also ICAO Council, "Summary Minutes with Subject Index" 151st Sess (1997) ICAO Doc 9704-C/1122, C-Min. 151/1-15 at 94-95, 101. See also ICAO Council, "Possible Enhancement of the Implementation of ICAO Annexes on Aviation Safety and Security", (1997) ICAO Doc WP C–WP/10612 at para. 2.3
[759] ICAO, *Directors General Conference, supra* note 734 at 2-1. See also Huang, *Aviation Safety through the Rule of Law*, *supra* note 538 at 74; See also Resolution A32-11, *supra* note 735.
[760] Huang, *Aviation Safety through the Rule of Law*, *supra* note 538 at 75.
[761] Resolution A32-11, *supra* note 735.
[762] Huang, *Aviation Safety through the Rule of Law, supra* note 538 at 75.
[763] *Ibid*.
[764] *Ibid* at 76.

One should further note that the effect of SARPs is that they create a favorable presumption of the legality of the conduct they prescribe for those who comply with them.[765]
Looking at ICAO practice, one can note that since 2007, following Assembly Resolution A36-13, ICAO introduced a new provision that requests Contracting States unable to comply with SARPs to inform ICAO of the reason for their non-compliance. The non-compliant State has, therefore, the burden of providing and proving a justification for not adhering to SARPs.[766] The Council's power under Article 54(j) to request information from States as follow-up of Assembly resolutions or Council decisions is a very effective form of supervising States' compliance and is further strengthened by the system of name and shame to which more effective consequences are attached than traditional sanctions in international law.[767]

The implementation and evolution of audits through the years has significantly proven that traditional practices and theories of international law are not within rigid boundaries. On the contrary, a new relationship between ICAO and its Member States has been shaped and has manifested a further shrinkage of State sovereignty for the benefit of the whole international community.
The answer to why ICAO has gained such powers without a formal amendment of the Chicago Convention indeed "lies in the commitment of the entire international community to protect the safety of international civil aviation".[768] As Dr. Kotaite observed:

> When safety standards and procedures are involved on international flights, one cannot even take the position that non-compliance by a sovereign State affects only the citizen of that State. Any other State that receives flights of aircraft registered in the non-complying State has every reason to be concerned about whether international standards and procedures are in fact being followed with respect to such aircraft and crews.[769]

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[765] C H Schreuer, "Recommendations and the Traditional Sources of International Law", German YB of Int'l L 20 (1977) 103 at 118.
[766] ICAO, *Consolidated statement of continuing ICAO policies and associated practices related specifically to air navigation,* Res A36-13 (2007) at Appendix D, Associated Practices at 3, ICAO Doc 9902 at II-7; Huang, *Aviation Safety through the Rule of Law,* supra note 538 at 197.
[767] B Sloan, "General Assembly Resolutions Revisited (Forty Years Later)". BYIL LVIII (1987) at 115, 134. Huang, *Aviation Safety through the Rule of Law,* supra note 538 at 198.
[768] Huang, *Aviation Safety through the Rule of Law, supra* note 538 at 78.
[769] Assad Kotaite, "Sovereignty Under Great Pressure to Accommodate the Growing Need for Global Cooperation" (1995) 50:10 ICAO J at 20.

Compliance with international standards has shifted from being an issue of exclusive national jurisdiction to that of the international community as a whole and positions the duty of compliance with standards and its oversight as an obligation *erga omnes*.[770]

The fact that ICAO has achieved a new means of international regulation implementation without any amendment of the Convention is a remarkable result from an international law-making process point of view,[771] which is especially relevant from the perspective of incorporating the regulation of new aerospace operations within its jurisdiction. As with aerospace technology, civil aviation evolves rapidly, and to cope with such changes, a self-contained regime has been formed organically, in which innovative approaches to standard-setting and rule-making are able to produce the desired results without the need of concluding a multilateral treaty.[772]

1.8 Sui-generis nature of ICAO standards

The nature of the safety obligations under the Convention reveals that they are not founded on the basis of reciprocity but rather constitute obligations *erga omnes*. The development of international law has seen a progressive shift from individualistic or bilateral interests to community interests. International law has, in fact, evolved from the law of international co-existence to the law of international cooperation.[773]

Within this perspective, the ICJ's Reservations to the Genocide Convention advisory opinion could be extended to the Chicago Convention in the following terms:

> the contracting States […] have, one and all, a common interest, namely, the accomplishment of those high purposes which are the *raison d'être* of the convention.[774]

In the Barcelona Traction Case the court held that:

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[770] Huang, *Aviation Safety through the Rule of Law, supra* note 538 at 80. See also *Barcelona Traction, Light and Power Company, Limited (Belgium v. Spain),* [1970] ICJ Rep 3 at 32.

[771] Huang, *Aviation Safety through the Rule of Law, supra* note 538 at 80.

[772] *Ibid* at 80-81. Dr. Huang, regarding the safety audits, identifies an innovative approach as "a top-down approach though an Assembly resolution approving the audit programme, followed by a bottom-up approach through individual memoranda of understanding between ICAO and each of the audited States". Huang, *Ibid* at 81. See also ICAO, "Possible Enactment of the Implementation of ICAO Annexes on Aviation Safety and Security" (1997) ICAO Doc C-WP/10612 at para 2.5.1 (c).

[773] *See* Wolfgang Friedmann, *The Changing Structure of International Law* (New York: Columbia University Press, 1964).

[774] *Reservations to the Convention on the Prevention and Punishment of the Crime of Genocide*, Advisory Opinion, (1951) ICJ Rep 15 at 23.

> In view of the importance of the rights involved, all States […] have a legal interest in their protection […].[775]

Article 44 of the Chicago Convention in providing that one of the most important objectives of ICAO is to ensure "the safe and orderly growth of international civil aviation through the world," clearly embodies a common interest of all States.[776] Similarly, the provision of Article 33, which imposes on States the requirement to recognize the certificates and licenses of each other if these maintain the minimum standards set by ICAO and, conversely, authorizes a State to refuse to recognize certificates and licenses of a non-compliant State, guarantees the interests of all. Because the nature of the safety obligation is an obligation erga omnes, the non-compliant State cannot refuse to recognize certificates and licenses of other States solely on the grounds that they rejected its own. Therefore, the safety standards set by the Convention are designed to protect the common interest of the whole international community, and States have this responsibility of compliance "both collectively and individually".[777]

The ICJ *Reparation for Injuries* advisory opinion states that "only the party to whom an international obligation is due can bring a claim in respect of its breach".[778] Consequently, the *erga omnes* nature of the obligation implies that any state can validly claim a breach and no damage is necessary to support a valid claim.[779] This has important practical consequences as it refutes Dr. Cheng's assertion that at most international standards have a residual legal force arising from the damage that a State suffers due to its reliance on a false representation of compliance of another State.[780] Another practical consequence is that the ICAO audit system is further reinforced by the fact that any State can identify the unwillingness of another to submit to the Convention as a breach of an obligation.

However, although obligations *erga omnes* are the concern of all States which have a legal interest in their protection, the force of these obligations may differ from one to another. The VCLT defines *jus cogens* as "a norm accepted and recognized by the international community of States as a whole as a norm from which no derogation is permitted and which can be modified only by a subsequent norm

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[775] *Barcelona Traction, Light and power Company, Limited* (*Belgium v. Spain*), [1970] ICJ Rep 3 at 32 para 33.
[776] C Tomuschat, "Obligation Arising from States Without or Against Their Will" (1993) 241 HR 195 at 209, 227.
[777] ICAO, *Unified strategy to resolve safety-related deficiencies*, Res A35-7 (2004), ICAO Doc 9848 at I-60.
[778] *Reparation for Injuries Suffered in the Service of the United Nations,* Advisory Opinion, [1949] ICJ Rep 174 at 181-182.
[779] ILC, Articles on State Responsibility, *supra* note 298, art 48 1.(b).
[780] Henaku, *The Law on Global Air Navigation by Satellite, supra* note 566 at 35.

of general international law having the same character".[781] One should note: "all *jus cogens* create obligations *erga omnes*, but not all obligations *erga omnes* possess the non-derogatory character of *jus cogens*".[782] Surely, Article 3bis of the Chicago Convention is an expression of *jus cogens*.
But what is the force of the obligation to comply with ICAO standards? Abeyratne has advanced that the duty to comply with SARPs under the Convention has become *jus cogens*.[783] This thesis disagrees with such a conclusion. The duty to comply under Article 37 falls shorts of the status of *jus cogens* when confronted with Article 38's possibility of non-compliance and derogation. Peremptory norms of international law do not accept non-compliance.

ICAO resolutions do not fit in any of the sources of international law listed in Art. 38(1) of the Statute of the ICJ. Article 38, nevertheless, "has been challenged as an incomplete list of the sources of international law".[784] Indeed, under certain circumstances, ICAO Assembly resolutions produce fully binding effects. Such resolutions shall be put in a twilight zone between Article 38 sources and mere non-binding guidance. Often this twilight area has been labelled as "soft law". Establishing a clear division between law and non-law presents a serious difficulty in the context of the ICAO system. For example, even when one State files a difference under Article 38 of the Chicago Convention, the standard that the State will comply with cannot be disregarded by other States, which may find it difficult to operate in the non-compliant state or to allow its aircraft to operate in their territories.
The discussion on the legal force of SARPs becomes more complicated if one considers that within the ICAO system a clear-cut distinction between law and non-law cannot be made, but also that it is extremely difficult, if not impossible, to make a clear distinction between soft law and hard law.[785]

According to Professor Dempsey:

> whatever *de jure* "soft law" attributes SARPs may have, they appear to have corresponding *de facto* "hard law" attributes as well.[786]

[781] VCLT, *supra* note 144, art 53.
[782] Huang, *Aviation Safety through the Rule of Law, supra* note 566 at 168.
[783] R I P Abeyratne, "The Legal Status of the Chicago Convention", *supra* note 542 at 120.
[784] Jakhu et al., "The Sources of International Space Law", *supra* note 612 at 609.
[785] Huang, *Aviation Safety through the Rule of Law, supra* note 566 at 196.
[786] Dempsey, *Public International Air Law, supra* note 18 at 104.

Similarly, Ganz remarks that the difference "between law and quasi-legislation becomes blurred because there are [different degrees] of legal force", and that rules should be considered within a legal spectrum that goes from voluntary on one side to fully binding on the other.[787]
Therefore, what is the nature of ICAO assembly resolutions and SARPs? According to White:

> [although] it is possible to force the legal output of organizations into established sources of international law, it would be better to assess such output as a separate, and potentially new, source of international law.[788]

This thesis sustains that the ICAO system is a sui generis type.

2 Chicago Convention as a self-contained regime

The International Law Commission (ILC) in its report on "*Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law"* states that:

> One aspect of globalization is the emergence of technically specialized cooperation networks with a global scope […] that transgress national boundaries and are difficult to regulate through traditional international law. National laws seem insufficient owing to the transnational nature of the networks while international law only inadequately takes account of their specialized objectives and needs.[789]
>
> As a result, the networks tend to develop their own […] specialized rules and rule-systems […] [which frequently] emerge through intergovernmental cooperation and in particular with the assistance of (specialized) intergovernmental organizations. The result is the emergence of regimes of international law that have their basis in multilateral treaties and acts of international organizations, specialized treaties and customary patterns that are tailored to the needs and interests of each network […].[790]

[787] G Ganz, *Quasi-Legislation: Recent Developments in Secondary Legislation* (London: Sweet & Maxwell, 1987) at 1.
[788] Nigel D White, *The Law of International Organizations* (Manchester: Manchester University Press, 2005) at 160.
[789] ILC, *Fragmentation of International Law: Difficulties Arising from the Diversification and Expansion of International Law*, UNILCOR, 58th Sess, UN Doc A/CN.4/L.682 (2006) at 244 para 481 [hereinafter ILC Report].
[790] *Ibid* at 244-245 para 482.

The Commission identifies these specialized regimes as 'self- contained':

> The rationale of special regimes is the same as that of *lex specialis*. *They take better account of the particularities of the subject-matter to which they relate; they regulate it more effectively than general law and follow closely the preferences of their members.*[791]

This thesis argues that the Chicago Convention system, while remaining communicant with, connected to, and operating under the main umbrella of public international law, is, indeed, a self-contained regime. Recognizing such a nature is of crucial importance in seeking the extension of ICAO jurisdiction over aerospace activities, particularly if it is doubtful that space law is a self-contained regime in a strict sense. A frequent aspect of such regimes is the presence of an international administrative body[792] which is competent to create, modify, or eliminate special rules and establish a hierarchical position among them, allowing these regimes to evolve and adapt to new challenges. In practice they become "self-perpetuating".[793]

One must be aware that identifying public international air law as a self-contained regime is not a denial of general law. There is not a "closed" self-regime. Indeed, the Commission, in fully recognizing the existence of self-contained regimes, states that:

> Even in the case of well-developed regimes, general law has at least two types of function. First, it provides the normative background that comes in to fulfil aspects of its operation not specifically provided by it. […] Second, the rules of general law also come to operate if the special regime fails to function properly.[794]

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[791] *Ibid* at 99 para 191 [emphasis added].
[792] Alexandra Khrebtukova, "A Call to Freedom: Towards a Philosophy of International Law in an Era of Fragmentation" (2008) 4(1) J Int'l L & Int'l Rel 51 at 63 [hereinafter Khrebtukova, "A Call to Freedom"].
[793] "The institutions […] of regimes are set up in order to administer the continued application of their specific rules and principles. Born of the rationality embodied in a given regime's particular hierarchies of norms and values, its implementation bodies deal with issues formulated on the basis of that rationality. […] In this way, regimes perpetuate themselves". See Khrebtukova, "A Call to Freedom", *supra* note 792 at 64. See also Stotler, *Air and Space Law, supra* note 462 at 52.
[794] ILC Report, *supra* note 789 at 100 para 192.

> No legal regime is isolated from general international law. It is doubtful whether such isolation is even possible: a regime can receive (or fail to receive) legally binding force ("validity") only by reference to (valid and binding) rules or principles *outside it*.[795]

Although there is no a uniformly accepted legal definition of self-contained regime, the ILC, in its report, provides that such a concept could be understood under three senses: a narrow, a broad, and an even broader.[796]

The ILC's commentary to article 55 of the Draft ARS makes a distinction between "weaker forms of *lex specialis*", intended as "specific treaty provisions on a single point" and "strong forms of *lex specialis*," which include "what are often referred to as self-contained regimes."[797] The Commentary does not provide a definition for what a strong form of *lex specialis* is. Nevertheless, it refers to two cases, one of the PCIJ and one of the ICJ,[798] which the Commission uses in its report to distinguish between two uses of the notion of self-contained regime, a narrow and a broad.

1) A narrow sense denotes "a special set of secondary rules claim[ing] priority over the secondary rules in the general law of State responsibility".[799] This definition appears to rely on the *Hostage Case* dictum in which the ICJ "identified diplomatic law as a self-contained regime […] by reference to the way it had set up its own "internal" system for reacting to breaches"[800]:

> The rules of diplomatic law, in short, constitute a self-contained regime which, on the one hand, lays down the receiving State's obligations regarding the facilities, privileges and immunities to be accorded to diplomatic missions and, on the other, foresees their possible abuse by members of the mission and specifies the means at the disposal of the receiving States to counter any such abuse.[801]

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[795] *Ibid* at 100 para 193. For further reference on how every special regime links up with general international law see *Ibid* at 101 para 194.
[796] *Ibid* at 68 paras 128 and 129.
[797] ILC Commentary to the Draft ARS, *supra* note 407 at 140 para (5).
[798] *Ibid* at 140-141 para (5)
[799] ILC Report, *supra* note 789 at 66 para 124
[800] *Ibid*.
[801] *United States Diplomatic and Consular Staff in Tehran, supra* note 404 at 40 para 86. See also *Military and Paramilitary Activities in and against Nicaragua*, *supra* note 188 at 134 para 267. See also ILC Report, *supra* note 789 at 66 para 125.

2) A broader sense of a self-contained regime is identified in the PCIJ dictum of the S.S. *Wimbledon Case* with regards to the provisions of the Kiel Canal.[802] Under this sense, self-contained is intended as "interrelated wholes of primary and secondary rules, sometimes also referred to as "systems" or "subsystems" of rules that cover some particular problem differently from the way it would be covered under general law".[803]

3) Lastly, the ILC identifies a self-contained regime in an even broader sense that comprises "whole fields of functional specialization […] [in which] special rules and techniques of interpretation and administration are thought to apply".[804] In this sense when referring, for example, to "principles of international air law", it is assumed that "those principles differ from what the general law provides for analogous situations."[805]

International air law falls under all the three meanings:

1) It is self-contained in the narrow sense as it possesses secondary specialized rules for the breach of a primary international obligation.[806] Further, under Article 84 of the Chicago Convention, ICAO has a quasi-judicial role for settlement of disputes arising from a claimed breach of such obligations.[807] A self-contained dispute settlement that remains connected to the general system of public international law is evidenced by the fact that the decision of the Council under Article 84 can be appealed, according to Article 85, to either an *ad hoc* arbitral tribunal or to the ICJ.[808]

2) It is self-contained and in the broader sense identified by the PCIJ in the *S.S. Wimbledon Case*. ICAO, indeed, has set a specific system that applies in a case of a breach of a Standard or of other obligations provided under the Convention. Further, ICAO's quasi-legislative power of Article 37 and the provisions of Articles 94 and 95 respectively provide procedures to amend or denounce the Convention. International air law, therefore, is a system capable of creating, modifying,

[802] *Case of the S.S. "Wimbledon"* (1923) PCIJ (Ser A) No 1 at 23-24.
[803] ILC Report, *supra* note 789 at 68 para 128.
[804] *Ibid* at 68 para 129.
[805] *Ibid*.
[806] *Ibid* at 72 para 135.
[807] Chicago Convention, *supra* note 65, art 84. This adjudication method has been already used on five occasions, *see* Dempsey, *Public International Air Law, supra* note 18 at 75.
[808] Chicago Convention, *supra* note 65, art 85. See also ILC Report, *supra* note 789 at 72 para 135.

terminating, interpreting and applying the whole set of its specialized rules.[809]

3) It certainly is self-contained in the broadest sense as it provides interpretative guidance and direction that deviate, partially or totally[810], from general international law.[811]

International space law does not fall under the first category as it fails to provide a system of specialized secondary obligations that apply in case of a breach of primary obligations.[812] It may fall in the second as creates specialized primary obligations; nevertheless, it fails to establish an international body capable of creating and modifying rules.[813] It however falls under the third category.[814]

Conclusion

This chapter has attempted to clarify the innovative character of the ICAO system (and of the Convention) as a pillar of a self-contained regime of public international air law. As seen above, States are increasingly reluctant to adopt traditional international hard-law instruments or to confer direct enforcement power to an international organization. The system of SARPs has proven itself to be a very efficient means of providing the necessary regulatory needs to international civil aviation in a flexible and innovative character. The "soft-law" nature of the standards does not undermine their legally-binding character; on the contrary, the soft-law standards have proven to be more efficient than traditional hard-law instruments and further have put in crisis the traditional differentiation of source of law provided by Article 38 of the ICJ Statute. Further, ICAO has again proven itself able to catalyze States' interests in monitoring standard compliance. Uniformity of rules is essential to developing commercial international PTP suborbital operations. As seen above, national space legislation and approaches differ among countries in a potential controversial spiral of increased fragmentation. However, ICAO's role of guaranteeing uniformity and harmonization of the law and of keeping up with technological innovation has proven very effective. This should be the reason why ICAO should have jurisdiction over suborbital operations.

The next chapter will analyze the legal basis for ICAO to extend its role and powers to cover the regulation of suborbital aerospace operations.

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[809] ILC Report, *supra* note 789 at 72 para 135. See also Stotler, *Air and Space Law, supra* note 462 at 56.
[810] ILC Report, *supra* note 789 at 68 para 129.
[811] *Ibid* at 70 para 132.
[812] Stotler, *Air and Space Law*, *supra* note 462 at 54.
[813] *Ibid* at 56-57.
[814] ILC Report, *supra* note 789 at 68 para 129.

Chapter VI
A Proactive Approach as a Basis for an Evolutionary One

1 Need to proactively address the issue now

As seen in the previous chapter, the ICAO regulatory system has innovative characteristics. If ICAO's legal authority were applicable to civilian aerospace vehicles engaged in international flight, it would be a win-win solution for both civil aviation (as intended today) and new methods of aerospace transportations. Two problems of regulating such new activities are, in fact, the need of a comprehensive international uniform regulatory regime to guide their safe development and such a regime's necessary interaction with existing aviation regulations. If ICAO had this legal competence, both problems would be addressed at once and comprehensively.

This chapter will first explore whether the Chicago Convention grants ICAO the jurisdiction to adopt SARPS for commercial suborbital aerospace vehicles engaged in international transportation. Second, it will critically analyze which options and consequences should eventually be foreseen.

It is, therefore, necessary to explore, first, whether the Chicago Convention, *per se*, prohibits or limits its application to suborbital aerospace vehicles. If regulatory ground exists, does the application of the ICAO regulatory regime flow directly from the Convention, or only through an incidental interpretation, which means that aerospace vehicles would not fall within the competence of ICAO but could be regulated only incidentally within SARPs aimed to protect aircraft? This latter hypothesis finds its basis in the principle of implied extension, provided in the seminal opinion of the PCIJ in *Competence of the International Labour Organization to Regulate, Incidentally, the Personal Work of the Employer*, in which it was held that the competence of an international organization in relation to a specific function lay in the treaty provisions applicable to the functions of that organization, and that such competence ought to be determined through the treaty interpretation.[815] The Court asserted that the ILO treaty confirmed the power to extend its scope of functions to the agricultural sector.[816] Considering the broad scope of ICAO, one should verify whether the Organization could implicitly extend its functions to areas that are not aviation *strictu sensu*. One should however note that any

[815] *Competence of the International Labour Organization to Regulate, Incidentally, the Personal Work of the Employer* (1931), Advisory Opinion, PCIJ (Ser B) No 2 at 9 and ss.
[816] *Ibid* at 43.

implied extension should carefully be interpreted and, eventually, applied. As Judge Green Hackworth noted in his dissenting opinion to the 1949 *Reparation for Injury Case:*

> Powers not expressed cannot freely be implied. Implied powers flow from a grant of expressed powers, and are limited to those that are "necessary" to the exercise of powers expressly granted.[817]

The international customary law principles of the VCLT shall therefore guide such interpretation.[818]

The Outer Space Treaty applies to all activities in outer space and to all space objects;[819] however, it does not define outer space and it does not permit a clear determination of what falls under the definition space object. The Chicago Convention does not give any definition of airspace and of aircraft. Articles 1, 12 and 37 make clear that the Convention applies to international airspace and, through State implementation of the rules established under the Convention, to national airspace. The Convention solely applies to international civil aviation and to civil aircraft.[820] State aircraft are excluded from its application save in limited cases where the Convention incidentally applies.[821]

The Preamble of the Convention provides that States have "agreed on certain principles and arrangements in order that international civil aviation may be developed in a safe and orderly manner".[822] Indeed, the whole text of the Convention and especially its objectives enumerated in Article 44 is informed by the principal object of creating a unified regime of safety and navigation of airspace. To achieve these goals ICAO has been provided with the aims and objectives of "develop[ing] the principles and techniques of international air navigation and […] foster[ing] the planning and development of international air transport"[823], among those:

> (a) Insure the safe and orderly growth of international civil aviation throughout the world;
> (h) Promote safety of flight in international air navigation;
> (i) Promote generally the development of all aspects of international civil aeronautics.[824]

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[817] *Reparation for Injuries Suffered in the Service of the United Nations,* Dissenting Opinion by Judge Hackworth*,* [1949] ICJ Rep 174 at 198.
[818] See VCLT, supra note 144, arts 31, 34.
[819] Peter Haanappel, *The Law and Policy of Air Space and Outer Space – A Comparative Approach* (The Hague and New York: Kluwer Law International, 2003) at 11 [*hereinafter* Haanappel, *The Law and Policy of Air Space and Outer Space*].
[820] Chicago Convention, *supra* note 65, art 3(a).
[821] *Ibid*, art 3.
[822] Chicago Convention, *supra* note 65, Preamble.
[823] *Ibid,* art 44.
[824] *Ibid.*

With this regard one should note that the Convention's purpose *is not to regulate a specific type of vehicle; on the contrary, it aims at ensuring the safety and order of international civil aviation.*
A scenario where aircraft and aerospace vehicles operate in the same airspace without standardized rules of navigation, communication, and collision avoidance undoubtedly compromises the very basic objectives of the Convention. This is especially true if a substantial part of the flight path of aerospace flights happens at around the same altitude of current civil aviation.

2 ICAO practices

Following Article 31(3)(b) of the VCLT, when interpreting a treaty, "any subsequent practice in the application of the treaty which establishes the agreement of the parties regarding its interpretation provide the context for the purpose of its interpretation" shall be considered. The ICAO Assembly resolutions are arguably examples of such subsequent practices.
In Resolution A15-1 the ICAO Assembly recognized that:

> although the Convention does not specifically define how the term 'outer space' should be interpreted, the space used by or usable for international civil aviation is also used by space vehicles [therefore] *the use of the same medium by different fields of activity necessarily requires adequate co-ordination to achieve the normal and efficient functioning of both these fields.*[825]

In this sense the Assembly has directed the Council "to carry out a study of those technical aspects of space activities that affect international navigation and that, in its view, *call for special measures*, and report the results […]".[826]

Under Resolution A29-11 the ICAO Assembly provides that:

[825] ICAO, *Participation by ICAO in Programmes for the Exploration and Use of Outer Space*, Res A15-1 (1965), ICAO Doc 8528, A15-P/6 at 23 [emphasis added].
[826] *Ibid* [emphasis added].

> the exploration and use of outer space […] is of great interest to international civil aviation and *affect matters falling within the Organization's competence* under the terms of the Chicago Convention. […][827] *ICAO [is] responsible for stating the position of international civil aviation on all related outer space matters*.[828]

According to Dr. Dempsey and Dr. Mineiro, these ICAO Assembly resolutions:

> support an interpretation of the Convention that places outer space activities that affect international civil aviation *within the purview of ICAO*.[829]

From these resolutions, indeed, it appears that States Parties have provided ICAO with a clear obligation and power to ensure the safe development of civil aviation, which encompasses any non-aviation related activity that may, nevertheless, impact aviation safety. This also implies that any activity that somehow interacts with aviation or uses the same medium requires at least coordination with ICAO.[830] These reasons would at least be enough to provide ICAO, within the current status of the Convention and with no further action required by the Council, such as the potential modification of the definition of aircraft, with the authority to implicitly regulate suborbital activities in airspace.

Another example of subsequent practices that set a concrete precedent for ICAO to regulate areas non-considered as civil aviation *strictu sensu* is the promulgation of SARPs addressing environment and security concerns, respectively contained in two separate and *ad hoc* Annexes, 16 and 17[831].

Although the language of the Convention does not mention environmental and security issues, the provision of Article 37 allows ICAO to address "such other matters concerned with the safety, regularity, and efficiency of air navigation as may from time to time appear appropriate"[832] The wording is broad enough to provide ICAO the necessary legitimacy to regulate anything that could

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[827] *ICAO, Use of Space Technology in the Field of Air Navigation*, Res A29-11 (1992), ICAO Doc 9602 at I-33 [emphasis added].
[828] *Ibid* at I-34 [emphasis added].
[829] Paul S Dempsey and Michael Mineiro, "ICAO's Legal Authority to Regulate Aerospace Vehicles", *Proceedings of 3rd IAASS Conference* (2008) at 3 [emphasis added], [hereinafter Dempsey & Mineiro, "ICAO's Legal Authority"]
[830] *Ibid.*
[831] ICAO, *Annex 16 to the Convention on International Civil Aviation*, Environmental Protection, 8th ed (2017); ICAO *Annex 17 to the Convention on International Civil Aviation*, Security, 10th ed (2017).
[832] Chicago Convention, *supra* note 65, art 37.

seriously interfere with "the safe and orderly growth of international civil aviation"[833] , which was unforeseen when the Convention was drafted.[834]
Indeed, Dr. Abeyratne notes that:

> The ability to exercise its inherent powers has enabled ICAO to address issues on aviation insurance and establish an insurance mechanism; perform mandatory audits on States in the fields of aviation safety and security; and establish a funding mechanism to finance aviation safety projects, all of which are *not* provided for in the Chicago Convention but are not expressly prohibited.[835]

Keeping in mind the above, this author, however, believes ICAO competence on suborbital operations should go further.

2.1 ICAO's position on suborbital vehicles

In 2000, Dr. Assad Kotaite, then President of the ICAO Council, regarding the pertinence of ICAO's involvement in space transportation asserted:

> Laid out on the drawing boards of aircraft manufacturers and futurists are spacecraft that one day will carry passengers into the upper airspace and eventually into outer space. When that day comes, and it may not be that far away, real issues will need to be addressed by government regulators. [...] The idea of adopting ICAO as a model, *or expanding the mandate of ICAO to encompass outer space […] has merit*.[836]

Dr. Kotaite further duly noted that ICAO has been actively involved in promoting the use of space technology in aviation at least since 1972 when, at ICAO's 7th Air Navigation Conference, the concept of Future Air Navigation System (FANS) was discussed.[837]

At the 175th session of the ICAO Council, a Secretariat Working Paper was presented by the Secretary General and considered by the Council. The Working Paper, entitled *Concept of Suborbital Flights: Information from the International Civil Aviation Organization (ICAO)*, provides that:

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[833] *Ibid*, art 44(a).
[834] Dempsey & Mineiro, "ICAO's Legal Authority", *supra* note 829 at 5-6.
[835] Ruwantissa Abeyratne, *Aviation Security Law* (Berlin and London: Springer, 2010) at 274 [emphasis added].
[836] Assad Kotaite, "Formal Regulatory Framework Needed to Govern Expanding Operations in Outer Space" (2000) 55:7 ICAO J at 5 [emphasis added].
[837] *Ibid*.

> 2.3 […] Should sub-orbital vehicles be considered (primarily) as aircraft, when engaged in international air navigation, consequences would follow under the Chicago Convention, mainly in terms of registration, airworthiness certification, pilot licensing and operational requirements (unless they are otherwise classified as State aircraft under Article 3 of the Convention).[838]

Although the Council failed to determine whether the Chicago Convention *does* apply to suborbital vehicles engaged in international air operations, should it be recognized that these vehicles are civil aircraft, then the Convention applies.[839] The Working Paper, in fact, concludes:

> 6.1 Vehicles which would effect earth-to-earth connections through sub-orbital space could incorporate the constitutive elements of aircraft and fly as such at least during descending phase while gliding. However, rocket-propelled vehicles *could be* considered as not falling under the classification of aircraft […].
>
> 6.2 From a spatialist viewpoint, there is no clear indication […] which would permit to conclude on the applicability of either air law or space law to sub-orbital flights. On the other hand, it might be argued from a functionalist viewpoint that air law would prevail since airspace would be the main centre of activities of sub-orbital vehicles in the course of an earth-to-earth transportation, any crossing of outer space being brief and only incidental to the flight. […] UNCOPUOS […] is considering the question of possible legal issues with regard to aerospace objects but no final conclusion has been reached yet.
>
> 6.3 Should, however foreign airspace(s) be traversed, and should it be eventually determined that sub-orbital flights would be subject to international air law, pertinent Annexes to the Chicago Convention would in principle be amenable to their regulation.[840]

[838] ICAO, *Concept of Sub-orbital Flights*, supra note 207 at 3 para 2.3.
[839] See Dempsey & Mineiro, "ICAO's Legal Authority", *supra* note 829 at 2.
[840] ICAO, *Concept of Sub-orbital Flights*, *supra* note 207 at 5 paras 6.1, 6.2, 6.3 [emphasis added].

3 Expanding ICAO authority

No provision of the Convention specifies or defines what an aircraft is, but its definition is contained in certain Annexes of the Convention, as follows:

> [An aircraft is] "any machine that can derive support in the atmosphere from the reactions of the air other than the reactions of the air against the Earth' s surface".[841]

Should it be determined that the term aircraft of Article 3(a) is applicable to civil suborbital aerospace vehicles, then the Convention, as well as ICAO's jurisdiction, extends to them.[842]

On this point, Dr. Dempsey and Dr. Mineiro maintain that:

> It seems absurd to conclude the treaty was meant to be frozen in time, only regulating vehicles that fit within the concept of aircraft at the time of the drafting of the Convention.[843]

Indeed, the aircraft used in 1944 are practically non-existent anymore. At the time of the Convention neither jet engines nor hypersonic aircraft such as the Concorde had been conceived. Nevertheless, one of the aspects of the Convention's modernity is that without a firm definition of aircraft in its text, it may adapt from time to time to technological advancement.

3.1 In the short term

Commercial PTP suborbital operations could constitute the natural and gradual evolution of current civil aviation. It is essential, therefore, that they fall under a uniform regime of global governance which ensures their safety and that of international civil aviation. Any future action towards their regulation should indeed consider their interaction with airspace and the activities in it. But how to address it? One, indeed, should consider that "[t]he international treaty-making process can be slow and, at times, may not even result in an agreement".[844]

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[841] See Annex 2, Annex 7 and Annex 11, *supra* note 113.
[842] Dempsey & Mineiro, "ICAO's Legal Authority", *supra* note 829 at 2.
[843] *Ibid* at 3.
[844] Steven A Mirmina, "Reducing the Proliferation of Orbital Debris: Alternatives to a Legally Binding Instrument" (2005) 99:3 AJIL 649 at 652.

Nevertheless, as seen above, a careful reading of the Chicago Convention does not provide any bar to the possibility of ICAO regulating suborbital flights. On the contrary, ICAO *has the duty and authority* to ensure the safe and orderly growth of air navigation, "even if the exercise of such authority results in a region of space or over a particular transportation vehicle to be subject to conflicting legal regimes".[845]

As attorney Tracy Knutson provided,

> [O]ne of the primary hazards or risks associated with this young industry is that there are no accepted standards guiding the industry regarding critical concerns like the physical condition of the [spaceflight participant], what gear the [spaceflight participant] should be required to wear, what safety equipment should be in the vehicle, what is required in a safety briefing, what type of vehicle is capable of routinely traveling to suborbital space, or even what specific categories of aircraft or specific instrument ratings a pilot must have[846]

For States to act in the regulation of aerospace operations, there is no reason to wait until an aircraft collides with a suborbital vehicle or until a vehicle itself crashes for lack of safety features. A proactive approach to obviate the pressing need for a unified legal regime is therefore necessary. ICAO shall take the lead and regulate such activities.

As Dr Dempsey and Mineiro suggested, the simplest – and perhaps – wisest way to proactively (and not merely implicitly) address the issue would be – at least in the immediate period – for ICAO to use the power granted under Article 37 to provide standards for suborbital vehicles.[847]

This will require first, the modification of the definition of aircraft so as to include suborbital vehicles with the contextual modification of the other relevant Annexes or the introduction of a new Annex - Annex 20 - altogether. Although it has been suggested that the mere modification of the term aircraft would be enough "so that when [suborbital vehicles] fly in airspace used by civil aircraft, the rules of

[845] Dempsey & Mineiro, "ICAO's Legal Authority", *supra* note 829 at 7.
[846] Tracey Knutson, "What is "Informed Consent" for Space-Flight Participants in the Soon-To-Launch Space Tourism Industry?" (2007) 33:1 Space L J 105 at 114. When Ms. Knutson made this declaration, she was already Representative on the Commercial Space Transportation Advisory Committee (COMSTAC) sitting on the Risk Management Working Group within COMSTAC.
[847] Dempsey & Mineiro, "ICAO's Legal Authority", *supra* note 829 at 4.

safety and navigation are the same"[848] I disagree with the sufficiency of this single step. One, in fact, should take into consideration that the different exigencies of this emerging industry and any mechanical extension of the Annexes on the basis of a new refined definition of aircraft may hinder it. In fact, the introduction of a new definition accompanied by the modification of the relevant annexes or by the creation of a new annex altogether seems the better, if not the sole realistic, option. This would fully fall under Article 37 of ICAO power to amend or adopt SARPs.[849]

Under the Chicago Convention, a Member State is obliged, "to collaborate in securing the highest practicable degree of uniformity",[850] and to "keep its own regulations […] uniform, to the greatest possible extent," with SARPs.[851] As illustrated in the previous chapter, the nature and extent of such an obligation constitutes a basis for a production of *de facto* hard law which States are willing to respect. This will guarantee an orderly evolution of the regulation concerning suborbital activities in the optic of their and civil aviation safety.

3.2 In the long term – an International Civil *Aerospace* Organization

The above approach is sufficiently realistic and not too complex to realize a proactive move towards safeguarding the safety of civil aviation and suborbital flights, and it can well accommodate the near future regulatory exigencies of both industries. This thesis, however, does not claim to look at this step as a final one. On the contrary, such a move should be the premise for an evolutionary approach that seeks a future modification of the Chicago Convention so as to include all the civilian near-space activities in it. This will require many more years and subjects involved. Nevertheless, this thesis analyses and advocates a proactive approach as a solution for the interim and as a hint of an evolutionary approach that focuses on the creation of a new Convention explicitly encompassing aviation and near-space into the competence of a unique International Civil *Aerospace* Organization.

[848] Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 62.
[849] Chicago Convention, *supra* note 65, art 37. Indeed, the latest definition of aircraft is an amendment of the former and happen in 1967 by adding the phrase "other than the reaction of the air against the Earth's surface" to exclude hovercraft.
[850] *Ibid.*
[851] *Ibid,* art 12.

Currently there is no international body that oversees space safety as ICAO does for aviation. Despite the lack of such a regulatory framework, the rapid expansion of the space industry increases exponentially the risk.[852]

Although scholars such as Dr. Nandasiri Jasentuliyana have called for UNCOPUOS to play a similar role to that which ICAO does with aviation through the promulgation of "Space Standards" supported by a new a convention creating an international framework for space vehicles[853],one should note that since the 1979 Moon Agreement, UNCOPUOS has not been able to produce any treaty for ratification by States. Especially because UNCOPUOS is deadlocked, ICAO should take the lead in regulating commercial aerospace activities to provide for a system of comprehensive and consistent international standards, which are continuously updated and adapted to the needs of the aerospace sector. Further, one should consider that any international space flight organization would, when and if it is to be realized, need to coordinate with ICAO for regulations pertaining to the passage and interference of spaceflight with airspace and civil aviation. Indeed, aviation regulations would necessarily overlap with future space regulations.[854] It would then be more logical to let ICAO evolve organically to become the International Civil Aerospace Organization. In this sense, Jakhu, Dempsey and Sgobba support the extension of ICAO's mandate:

> to the region of space up to and including the geosynchronous orbit. Realistically, this is the region of commercial interest for the next half a century.[855] […] and when in future appropriate technology makes it possible for outlying regions beyond the geosynchronous orbits to become routinely usable for commercial space operations, ICAO's mandate might again be extended

[852] Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 14. COPUOS, indeed, is the only intergovernmental body that considers all legal aspects of outer space activities. Nevertheless, it is not comparable to ICAO as per scope and functions. COPUOS, which has been set up in 1959 by the UN General Assembly, is mandated to "govern the exploration and use of space for the benefit of all humanity: for peace, security and development". See "Committee on the Peaceful Uses of Outer Space", *UNOOSA* (online): <http://www.unoosa.org/oosa/en/ourwork/copuos/index.html>.The Committee, which is also tasked with reviewing and "studying legal problems arising from the exploration of outer space", has not the same structure of ICAO in terms of SARPs production, compliance facilitation and monitoring, etc. Involvement of COPUOS in the ambit of space safety are a set of principles relevant to the use of nuclear power sources in outer space endorsed by UNGA in its Resolution 47/68 of 14 December 1992 and its review of the IDAC guidelines endorsed by the UNGA in its resolution 62/217 of December 2007. The only global organization which provides international space safety standard is ISO. Nevertheless, such standards, besides not being a coordinated effort of space policies implementation, are vague and largely disattended. Further, they are fully voluntary. See Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 37.

[853] Nandasiri Jasentuliyana, *International Space Law and the United Nations* (The Hague and Boston: Kluwer Law International, 1999) at 379–382.

[854] Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 120.

[855] *Ibid*.

thereby entitling it to be responsible for the regulation of all forms of operations and transport in space.[856]

The OST, under Articles I and II, expressly prohibits the exercise of sovereignty in outer space, guaranteeing its freedom of exploration and use. Article 1 of the Chicago Convention expressly grants exclusive State sovereignty over national airspace. At first one may object that the two provisions of the OST are irreconcilable with ICAO's extension of authority over outer space. Nevertheless, those respective principles do not constitute an obstacle. On the contrary, one should note that under Article 12 of the Chicago Convention, ICAO is responsible for regulating safety and navigation over the high seas, which cover 72% of the Earth's surface, over which the majority of space-bound traffic takes place. Therefore, there already is a precedent for ICAO to regulate areas not subject to State sovereignty.[857] Furthermore, many systems fundamental to guaranteeing aviation safety and upon which aviation fully depend are increasingly shifting to space-based systems that have a nexus to space activities, either in space or through the use of outer space.[858] ICAO should be involved in the administration and control of such a region since it is also necessary to guarantee aviation safety. Further, there are future perspectives of integration between air traffic management and space traffic management (ATM-STM), dual-use airport-spaceports, and other infrastructure whose functions will need to be integrated under a single, uniform, international regulatory framework.[859]

In recent years, Jakhu, Dempsey and Sgobba have advanced a concrete hypothesis on how to structure an "ICAO for space".[860] Although the analysis of such a proposal is beyond the scope of this thesis, the suggested process to implement it are worth considering within the perspective of an evolutionary approach. According to the authors, as it may take even 25 years to modify the Chicago Convention, three possible options have been taken into consideration as alternatives to directly amending it:

1) Expand ICAO's jurisdiction under the above-mentioned Article 37's residual powers of ICAO over anything that involves aviation safety and efficiency.
2) The Council makes appropriate changes to current ICAO annexes so as to expand its jurisdiction to space activities.

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[856] *Ibid*.
[857] *Ibid* at 121.
[858] *For example*: traffic control, weather forecasts, aviation communication services, a series dispositive and services based on GPS and its augmentation systems, etc. See ICAO, GANP 2016, *supra* note 701.
[859] Jakhu, Sgobba & Dempsey, *ICAO for Space?, supra* note 12 at 123.
[860] *Ibid* at 132-133.

3) The creation of a new treaty which could grant ICAO the right to conduct space traffic management and promulgate space safety SARPs.[861]

One should note that the Convention has been modified several times in the last years; nevertheless, it is true that modification in this direction may well encounter the resistance of many States. Indeed, the Chicago Convention is among the most successful treaties. This of course does not mean that it has been created to remain frozen in time, for as history demonstrates, there have been gradual modifications to the Convention whenever developments and events demanded. The first two alternatives are – however – too ambitious and *simplistic* to achieve such an expansion of jurisdiction. Indeed, not all near-space activities impact or interact with civil aviation safety, and such an expansion of jurisdiction cannot rely on residual ICAO power but would need solid principles and a clear mandate. For this reason, the author endorses the third solution as the *sole* path for an evolutionary approach. In this sense, perhaps a *protocol* to the Chicago Convention would be the best path to follow.

Conclusion - The way forward

This study has been carried out to investigate those selected but key legal issues that justify the need, urgency, and legitimacy for ICAO to immediately address the regulation of commercial suborbital operations.

As discussed, there is no established legal delimitation between airspace and outer space, and it is unclear whether there is a grey area between the two domains, and which rules apply to operations in this grey area: rules from space law treaties, rules from the Chicago Convention, or rules from neither regime. This situation is further complicated by the lack of definition of aerospace vehicles and the all-encompassing definition of space objects. Further, aircraft are defined in ICAO SARPs in a way that precludes suborbital vehicles to fully fall under this definition. Such uncertainty of the law creates a dangerous void of comprehensive rules disciplining suborbital operations.

On the one hand, the regime of international space law is not comprehensively developed to a level necessary to accommodate such operations. Although space law treaties have laid down fundamental principles that serve as guidance for the future and more detailed rules, the lack of a centralized institution like ICAO to regulate space activities profoundly penalizes the comprehensive development of a viable regulatory regime for this nascent industry. Further, as analyzed above,

[861] *Ibid* at 139.

national approaches to the regulation of aerospace activities seem to vary greatly. There is a concrete risk of the fragmentation of space law, which could ultimately endanger the safety of the industry and of other operators of the medium. On the other hand, international air law is very well developed in both public and private regimes. Indeed, ICAO plays a fundamental role in harmonizing the rules of the air among countries and in guaranteeing the safety, security, efficiency, and environmental impact of international civil aviation. In this sense, ICAO has the potential to cover, under its global governance umbrella, the aerospace sector.

As illustrated above, certain countries are creating the opportunity to develop international suborbital PTP transportation outside and ahead of any comprehensive international regulatory regime that currently exists. A proactive approach by ICAO would pave the way for a harmonious development of the suborbital industry.

This research demonstrates that ICAO is indeed the best system for regulating suborbital operations and to actuate the passage from *lex lata* to *lex de ferenda* for the benefit of the international community. As presented above, the Chicago Convention grants the necessary powers to ICAO to address the regulation of aerospace operations in a comprehensive manner, at least for the near future. Further, from the point of view of safety, ICAO has an obligation to address the regulation of these flights to ensure the safety of civil aviation. The relevance of this study at this point in time should, therefore, be seen as the need of proactively addressing the issue now.

A proactive approach to the issue does not prevent an evolutionary one. As seen above, the area that goes from normal flight altitude to LEO will be the commercial focus of the next 50 years in the field of commercial aerospace applications. Technology is rapidly developing, and it will unavoidably change the way we think about international transportation by flight. Further, even current civil aviation is and will increasingly be more reliant on space. It is fundamental that a single intergovernmental agency addresses and is empowered with the competences to address such activities, and it is reasonable that ICAO could become the International Civil Aerospace Organization. The modification of the Chicago Convention through a protocol could broaden ICAO powers up to LEO. A protocol, indeed, would perhaps be the best instrument: States having the interest and capability to exploit this area could effectively join it. This would provide ICAO with the necessary basis to broaden its competence without abruptly unsettling the Chicago Convention.

Historically, States have been reluctant to proactively regulate a subject matter. In fact, a reactive approach has been dominant in practically all branches of law. There is no need to wait for a catastrophe to occur before seeking ICAO's input or involvement. Despite arguing that up to now the

Chicago Convention has greatly served its purpose, this cannot hinder the need to change, to move forward. As President Kennedy once said,

> Change is the law of life. And those who look only to the past or present are certain to miss the future.[862]

[862] John F Kennedy, Address in the Assembly Hall at the Paulskirche in Frankfurt, 26 June 1963.

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