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SPACE PASSENGER LIABILITY

Stefan Kaiser, Germany*
Martha Mejía-Kaiser, Mexico†

1. ABSTRACT AND INTRODUCTION

On 21 June 2004 Space Ship One, the first privately funded, designed and operated craft reached an altitude of more than 100 km. Virgin Galactic, a company incorporated in Delaware, is planning to commence commercial suborbital flights in 2007 using an enlarged version of Space Ship One with about five passenger seats[1]. With the Commercial Space Launch Amendment Act of 2004, US legislation has started to establish rules on the liability of space flight participants. This paper compares these rules with the history of air law liability regimes.

Passengers who fly onboard these suborbital vehicles need to be protected against risks. Any resulting liability and insurance regime reflects not only risks, but also legal traditions. In this context, it needs to be seen if emerging national regimes can be the seeds for international regulation, or if future international rules will have to follow another path.

2. HISTORIC BACKGROUND

2.1 Air Transport

When aviation had reached an early stage of maturity, legislators realized that passengers needed legal protection against the risks of air travel. Consequently, in one way or another, national rules for the liability of the air carrier were established based on the contract of carriage of the passenger.

At the international plane, the Warsaw Convention of 1929[2], far-sightedly drafted, broke ground for the international unification of the private law on the field of the air carrier's liability for international air transportation. Its principle building blocks are as simple as efficient: non-waivable[3] strict liability for damages caused by the carriage by air[4] – but with a breakable[5] liability cap[6]. As a modern concept, the Warsaw Convention did not become old, but became a classic. In essence, it is an early international Convention on consumer protection.

* LLM (McGill).
† PhD (UNAM).

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Only in 1999, it was super-ceded by the Montreal Convention[7], which did not so much change the Warsaw foundations, but adapted it to the needs of the modern mass traveler using the services of a mature, safe and efficient airline industry. But the requirements of modern consumer protection prevail: In the improbable event of an accident, the complexity of aviation makes it very difficult for the passenger to prove the fault of the air carrier. For that reason, the liability limitation of Warsaw was abandoned and replaced by a staggered regime with strict liability up to a cap and, subject to counter-evidence, presumed unlimited liability there above[8].

2.2 Space Transport

(a) The focal point of liability for space activities is the protection of uninvolved bystanders on the ground or in atmospheric flight. The Outer Space Treaty[9] and the Liability Convention[10] are drafted around these concerns[11]. For a long time, liability for death and bodily injury of space crews and passengers was not an issue and therefore there exists no international regulation.

(b) Lacking any specific legal rules, liability for death and bodily injury of space passengers can be construed under domestic laws based on a contract of carriage, unless more specific national or international rules preclude the general ones.

(c) Private liability relating to spacecraft is strongly influenced by contractual practice. Among industrial players it is common to contractually conclude cross-waivers of liability. This is nothing unusual in industrial relations between risk sharing partners with equal bargaining power. It can be considered appropriate for a non-consumer environment, which is strongly experimental in nature.

If cross waivers were good for other industries, they could not be wrong for the emerging space industry. In the United States, however, the Commercial Space Launch Act of 1984 went a step further. It *mandates* waivers of liability for licensed activities between licensee or transferee with its contractors, subcontractors and customers, and contractors and subcontractors of the customers[12]. Thus in the US the Commercial Space Launch Act amplifies commercial contract practice[13]. One of the reasons is the own interest of the US Government to obtain similar reciprocal waivers from the involved parties[14].

(d) The application of cross waivers in space activities took a new turn with the Commercial Space Launch Amendment Act of 2004[15], which introduced regulation on manned suborbital flights. As a novelty, it requires also crew[16] and space flight participants[17] to execute mutual waiver of liability with the US government[18]. The Federal Aviation Administration's (FAA) Draft Guidelines for Commercial Suborbital Reusable Launch Vehicle Operations detail the information to be provided and the procedures to be followed, when space flight participants and crew sign such waivers[19]. It remains questionable if the liability waivers established in accordance with the Commercial Space Launch Amendment Act of 2004 are watertight, should they be challenged in court[20].

(e) However, at one crucial point the cross waiver requirement was abandoned: crew members and space participants will not be obligated to sign cross waivers with the

licensee or permitee, as foreseen in an earlier bill[21]. Nevertheless, it must be expected that in the US contractual waivers will also be used between operators of suborbital flights and their passengers. FAA administrator Marion Blakey draws a parallel to the FAA certification of experimental aircraft, which can be used to carry non-paying passengers[22], although the FAA rules do not address liability waivers. Provided operators of future suborbital flight vehicles inform their passengers about the spaceship and the medical factors of spaceflight, Blakey takes an easy approach "We recognize there is risk, but risks are worth taking"[23]. The reference to experimental aircraft is doubtful. Waivers agreed between operators of experimental aircraft and their passengers for recreational flights do not necessarily hold up in US courts. More important, suborbital passengers will not have the same bargaining power as their commercial operators.

(f) The cross waiver concept is the antipode to consumer protection. While cross waivers may hold up between parties with equal bargaining power, consumer protection laws create asymmetrical contracts for the protection of the weaker party. The Warsaw and Montreal Conventions belong to this latter category. On the contrary, the Commercial Space Launch Amendment Act of 2004 weakens the position of the space flight participant for the protection of the Government[24].

(g) Besides the cross waiver concept, the Commercial Space Launch Amendment Act of 2004 introduced an additional new insurance and liability aspect for space flight participants. The insurance coverage or demonstration of financial responsibility to be obtained by the licensee or transferee is *not* to protect the space flight participant[25]. Following this line, the US government's indemnification for third party claims exceeding liability insurance and financial responsibility requirements does expressly *not* cover space flight participants[26]. Although the US government is exploring ways of phasing out the liability indemnification regime[27], it remains unclear why the US exposes space flight participants to third party claims more than other involved parties[28]. By comparison, in air law there is no third party liability of passengers for aviation specific risks.

3. DIVIDING LINES

It is still unclear how a future liability regime for space passengers may look like. But the more significant the differences of the aviation and space passenger regime will be, the more important will be the dividing line between them. Regime shopping must be avoided, so that the rights of aviation passengers are not curtailed by applying less stringent space passenger liability rules. In turn, the Montreal Convention is not meant to apply to suborbital flights and space passengers.

3.1 Technical Distinction

From the technical perspective, it is easy to distinguish the extremes: orbital flights on one side and conventional aviation on the other. But suborbital flights are in between, where borders blur. Suborbital flights belong to an intermediary category between orbital flights and future space planes. Neither physical[29] nor functional[30] criteria appear to be satisfactory in distinguishing suborbital flight vehicles from space planes. The theories about the delimitation of air space and Outer space also lead to irritating results[31]. The registration of the involved vehicles is not of help either, as current US practice

shows: Space Ship One is a two stage hybrid vehicle, of which *both*, the jet-propelled carrier aircraft and the rocket-propelled space glider bear US civil *aircraft* registrations ("N–418SL" and "N–428KF" respectively).

3.2 The Liability – Insurance Nexus

(a) From a practical perspective, liability is strongly influenced by economic factors. The driving element is the (economic) assessment of damages, especially those, which cannot be restituted *in integrum*, for example in case of bodily injury or death. In order to warrant protection for third parties and passengers, any liability is only effective if the liability compensation can actually be paid. Insurance is the instrument to make this happen. In aviation, insurance is mandatory for third party damage and passenger liability. For many years insurance requirements were established nationally.

(b) But the inter-dependence of liability and insurance is evolving. Today international aviation lawmakers tend to align insurance with liability requirements. The European Union has set an example by enacting a Regulation on uniform aviation insurance requirements for both, passenger and third party liability[32]. The minimum insurance requirements of the Regulation follows the lines of the Montreal Convention, as far as passengers, baggage and cargo are concerned, and the structure of the Rome Convention[33], as far as third-party liability is concerned[34]. This legislative trend shows that today aviation liability is strongly seen in the context of insurability. Therefore liability is shaped along the lines of insurance, which is commercially available at acceptable market rates. In case of a mismatch, State action is needed, as happened following 9/11, when insurance companies rescinded airline insurance coverage for war and terror risks[35].

(c) Based on these considerations, it needs to be seen at what commercially available premiums suborbital flights can be insured. At the beginning of commercial operations, risks associated with suborbital vehicles will exceed risks of general aviation aircraft with the same number of passenger seats. As a result, a limited liability system, perhaps similar to the Warsaw Convention, can be considered appropriate. It could apply to the activities licensed under national space law legislation – but not to certified aircraft. Liability caps could be established at insurable levels. With this economically oriented approach, a liability system for suborbital flights could be established without relying on technical distinctions.

In comparison, future space planes need to operate from the beginning with an accident risk no higher than of conventional aircraft, so that the Montreal Convention can be applied. Otherwise passengers will not understand why the liability for space planes is less stringent than for conventional aircraft.

4. NEED FOR INTERNATIONAL REGULATION

Cross-border operations were the reason why the Warsaw Convention came into being already in 1929. For domestic flights there was no need to reach an international agreement. At first glance, one may conclude that the same applies to suborbital flights, because they are primarily intended to be launched from and to re-enter in the same State. But also other factors raise jurisdictional issues.

(a) The US Commercial Space Launch Act is based on the launching state concept of the Liability Convention[36]. Therefore the Act creates US jurisdiction for US citizens who launch vehicles, operate launch sites or re-entry sites or re-enter a vehicle, also outside of the US[37]. Irrespective of the location of operations of suborbital flights, the US nationality of the operator will determine the applicability of the US licensing regime, which will in turn determine the liability towards space flight participants as set out in the Commercial Space Launch Amendment Act of 2004.

It can be assumed that operators like Delaware incorporated Virgin Galactic will conduct suborbital flights not only from US territory. In such cases States may not accept an exterritorial application of the laws of the US in matters of liability relating to passengers on suborbital flights originating or landing in their territory. This could be a driver for establishing an international regime on space passenger liability.

(b) Assad Kotaite, President of the Council of the International Civil Aviation Organization (ICAO), considers ICAO to have international jurisdiction for protecting space passengers. For him outer space is an international zone like the high seas[38]. Over the high seas ICAO has a mandate to establish "rules of the air"[39]. Kotaite is right inasmuch as international regulation for space passengers is soon needed. It is highly doubtful, however, if States want to see this regulatory role to be exercised by ICAO, rather than COPUOS or by another multi- or bilateral mechanism. The pre-requisite for Kotaite's approach is an internationally recognized consensus on the delimitation of airspace and outer space, which does not exist.

5. CONCLUSIONS

At the bottom line, the liability rules for space flight participants as established by the Commercial Space Launch Amendment Act of 2004 must not only be qualified as an interim regime, but also as a typical reflection of the legal traditions under US domestic law. Industry protection takes precedence over passenger protection. In the litigious US environment, even the Government seeks coverage through cross waivers from all involved parties including crew and space flight participants. Therefore the Commercial Space Launch Amendment Act of 2004 cannot serve as an international model for space passenger liability.

Cross waivers are based on a concept of liberalism in private law, when both parties have equal bargaining power. This is the antipode to the Warsaw and Montreal Conventions, which provide non-waivable liability for the protection of the passenger.

Suborbital flights will be the first stepping-stone for commercial manned spaceflight. Fostering this emerging industry will require passenger protection rather than a risk-taking attitude. This new industry will need a liability passenger regime closer to the Warsaw Convention than the Commercial Space Launch Amendment Act of 2004. At the other end of the scale, the unlimited liability of the Montreal Convention is not suitable for an emerging industry either.

For the time being space passenger liability needs to be capped at a level, which can be insured with acceptable premiums. Linked to the economical assessment of the insurable risk, this liability regime does not need to rely on technical distinctions

relating to the nature of suborbital flights.

Space passenger liability needs to be regulated internationally. Otherwise national regulation will lead to segmentation, exterritorial application of national rules and conflict of laws.

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[1] Dornheim, Michael, SpaceShipWon, AW&ST, October 11, 2004 p. 34

[2] Convention for the Unification of Certain Rules Relating to International Carriage by Air (Warsaw Convention), 1929

[3] Art. 23 Warsaw Convention

[4] Art. 17 Warsaw Convention

[5] Art. 25 Warsaw Convention

[6] Art. 22 Warsaw Convention

[7] Convention for the Unification of Certain Rules Relating to International Carriage by Air (Montreal Convention), 1999

[8] Arts. 17 (1), 21 Montreal Convention

[9] Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, Including the Moon and Other Celestial Bodies (Outer Space Treaty), Jan. 27, 1967, 610 U.N.T.S. 205

[10] Convention on International Liability for Damage Caused by Space Objects (Liability Convention), March 29, 1972, 961 U.N.T.S. 187

[11] Today it can be said that this concern was overestimated. Since their entry into force, no compensation was paid based on the Liability Convention and the Outer Space Treaty.

[12] 49 USC 701, Sec. 70112 (b)(1) "A launch or reentry license issued or transferred under this chapter shall contain a provision requiring the licensee or transferee to make a reciprocal waiver of claims with its contractors, subcontractors, and customers, and contractors and subcontractors of the customers, involved in launch services or reentry services under which a party to the waiver agrees to be responsible for property damage or loss it sustains, or for personal injury to, death of, or property damage or loss sustained by its own employees resulting from an activity carried out under the applicable license."

[13] By comparison, the Australian Space Activities Act (Act No. 123 of 1998 as amended) does not mandatorily impose cross waivers when it states that regulations of the Governor-General "may make provision in relation to the waiver of some or all of the rights of persons connected with the launch or return, and of their employees, contractors and subcontractors, to seek compensation for damage to which this part applies." The referenced Space Activities Regulations 2001 (Statutory Rules 2001 No 1861) does not contain a regulation on liability waivers.

[14] 49 USC 701, Sec. 70112 (b)(2), see text in note 18

[15] Public Law 108-492 of 23 December 2004

[16] 49 USC 701, Sec. 70102 (2) (as amended) defines 'crew' as "any employee of a licensee or transferee, or of a contractor or subcontractor of a licensee or transferee, who performs activities in the course of that employment directly relating to the launch, reentry, or other operation of or in a launch vehicle or reentry vehicle that carries human beings."

[17] 49 USC 701, Sec. 70102 (17) (as amended) defines 'space flight participant' as "an individual, who is not crew, carried within a launch vehicle or reentry vehicle"

[18] 49 USC 701, Sec. 70112 (b)(2), as amended by the Commercial Space Launch Act of 2004 (amendments

underlined) "The Secretary of Transportation shall make, for the Government, executive agencies of the Government involved in launch services or re-entry services, and contractors and subcontractors involved in launch services or reentry services, a reciprocal waiver of claims with the licensee or transferee, contractors, subcontractors, crew, space flight participants, and customers of the licensee and transferee, and contractors and subcontractors of the customers, involved in launch services or reentry services under which each party to the waiver agrees to be responsible for property damage or loss it sustains, or for personal injury to, death of, or property damage or loss sustained by its own employees or by space flight participants resulting from an activity carried out under the applicable license. The waiver applies only to the extent that claims are more than the amount of insurance or demonstration of financial responsibility required under subsection (a)(1)(B) of this section. ... "

[19] Federal Aviation Administration, Draft Guidelines for Commercial Suborbital Reusable Launch Vehicle Operations with Space Flight Participants, version 1.0, February 11, 2005; Federal Aviation Administration, Draft Guidelines for Commercial Suborbital Reusable Launch Vehicle Operations with Flight Crew, version 1.0, February 11, 2005

[20] See also Martin Marietta Corp. v. Intelsat, 991 F. 2d 94 (4th Cir. 1992)

[21] H.R. 3752, 108th Congress, 2d Session, 3 February 2004

[22] Federal Aviation Regulations (FAR) Part 91, Section 91.319 and Part 21, Sections 21.191, 21.193, 21.195

[23] Cited after Dornheim, Michael, SpaceShipWon, AW&ST, October 11, 2004 p. 34

[24] This has some resemblance to the statutory liability limitations for the protection of the aviation industry against compensation claims developed by case law; see the General Aviation Revitalization Act of 1994, to amend the Federal Aviation Act, 49 USC App 1510-1518, Sec. 1119

[25] 49 USC 701, Sec. 70112 (a)(4)

[26] 49 USC 701, Sec. 70113 (a)(1), as amended by the Commercial Space Launch Act of 2004 (amendments underlined) "To the extent provided in advance in an appropriation law or to the extent additional legislative authority is enacted providing for paying claims in a compensation plan submitted under subsection (d) of this section, the Secretary of Transportation shall provide for the payment by the United States Government of a successful claim (including reasonable litigation or settlement expenses) of a third party against a licensee or transferee under this chapter, a contractor, subcontractor, or customer of the licensee or transferee, or a contractor or subcontractor of a customer, but not against a space flight participant, resulting from an activity carried out under the license issued or transferred under this chapter for death, bodily injury, or property damage or loss resulting from an activity carried out under the license. ... "

[27] The indemnification regime is planned to be eliminated and the National Academy of Public Administration is tasked to study the overall impact on the US space industry, specially on international competitiveness, if the indemnification is phased out, Public Law 108-492-Dec. 23, 2004, sec. 3.

[28] Strangely, 49 USC 701, Sec. 70113 (a)(1) does not mention "crew". Consequently "crew" is neither included in

the indemnification, nor expressly excluded like space flight participants.

[29] Physical criteria, such as the generation of (aerodynamic) lift by airfoils do no provide sufficient distinction. For achieving suborbital flights, one, two or multi-stage (hybrid) vehicles may be used, of which one or another may rely on aerodynamic lift without compromising the function of the combined vehicle to reach outer space. The physical criterion of achieving at least one complete Earth orbit, which is normally used to define a space object, reaches its limits in case of suborbital flights. By definition, they do not reach a full Earth orbit.

[30] Functional theories introduce an additional subjective notion, namely the purpose of the flight. If a vehicle is destined to space, it is considered a space object (even if it does not reach outer space in case of a failure at lower altitude). If a future space-plane is destined from one point on the Earth's surface to another, even if traversing outer space, it is considered an aircraft. This concept leads to irritating results in case of suborbital vehicles, although their design may not allow them to remain in outer space as long as a space-plane.

[31] At first glance, identifying the delimitation line between national air space and outer space appears an attractive solution for defining suborbital flights. One may say, whenever a vehicle reaches beyond this line, it becomes a suborbital (space) flight. COPUOS has not agreed for decades to establish this delimitation line (for the current status see U.N. Doc A60/20 (2005); Australia was the first State to determine in its national legislation the delimitation line at 100 km, see Australian Space Activities Act (Act No. 123 of 1998 as amended), sec. 8 (Definitions) "launch", "space object"). This concept alone cannot distinguish suborbital space flight from future aerospace planes. It is also insufficient, in case the vehicle does not reach this altitude, because of a failure.

[32] Regulation (EC) No. 785/2004 of 21 April 2004 on insurance requirements for air carriers and aircraft operators

[33] Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, signed at Rome on 7 October 1952. This Convention is ratified by 47 States. A modernization is currently under way at ICAO.

[34] ICAO, Assembly – 35th Session, Economic Commission and Legal Commission, A35-WP/87 of 16/08/04

[35] States provided guarantees for their airlines to cover war and terror risks and, as a replacement, are discussing mutual fund schemes to apply worldwide, see also ICAO, A35-WP/87 of 16/08/04.

[36] The launching State concept is based on nationality (Art. I (c) (i) Liability Convention) and territoriality (Art. I (c) (ii) Liability Convention). In order to cover the responsibility for national activities in outer space under Art. VI Outer Space Treaty, national space legislation needs to include the activities of nationals regardless of their location. This jurisdictional link based on nationality has no parallel in the Warsaw and Montreal Conventions.

[37] 49 USC 701, Sec. 70104 (a)

[38] Assad Kotaite, according to Rauch, L., L'OACI veut instaurer des règlements en matière de vols spatiaux civils, Presse Canadienne, 17 January 2005:
"Je ne vois rien d'autre que l'OACI pour mettre en place cette réglementation." ...
"Mais on devrait voir l'espace comme la

haute mer, une zone internationale ... un endroit appartenant à tout le monde."

[39] See Art. 12 (3) Chicago Convention. However, if ICAO's mandate for rules of the air were to extend to outer space, it would first of all relate to space traffic management, but not passenger liability (For a general overview of space traffic management see Perek, Lubos, Rational Space Traffic Management ZLW (53), 573-583 (2004); for parallels between rules of the air and space traffic management see Kaiser, Stefan, Rules of the Road for Space Traffic, 46th Colloquium on the Law of Outer Space (2003)). Art. 12 (3) Chicago Convention was not meant to extend ICAO's mandate to other international zones than the high seas and not to other vehicles than aircraft.