

Liability in the context of space tourism

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This article is dedicated to my colleague and friend Professor Soon-Kil Hong, Ph.D, who is the famous President of the Korean Association of Air and Space Law and distinguished teacher at the prestigious Hankuk Aviation University. I had the honour and pleasure to teach there a few years ago – upon his gracious invitation.

Professor Soon-Kil Hong has made a long, outstanding and impressive career in aviation and space activities, both from a practitioners and academic perspective. That is why I have tried to find a subject which addresses these facets of his personality – although this humble article cannot do justice to the great merits of Professor Soon-Kil Hong.

This article discusses the liability aspects for damages and injuries to passengers on suborbital flights, by examining:

1. Recent developments regarding space tourism
2. Suborbital flights in relation to the Chicago Convention
3. The application of space law treaties to space tourism
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1. The dawn of a new era: the emergence of commercial suborbital flights

Space tourism is perhaps triggered by human's desire to discover the unknown, to observe the curvature of the earth from a point far outside the earth, to experience brief moments of weightlessness and to watch how black outer space illuminated by sparkling stars can be. Space tourist can be carried on suborbital and orbital flights.

Suborbital flights are parabolic flights made during approximately three hours to points which are located at a distance of about 100 kilometres from the earth's surface, that is, the edge of outer space, whereas orbital flights may go far beyond that distance. As suborbital tourism, also referred to as "near space tourism", is more concrete and realistic at the moment, and it offers an interesting field of discussion the interaction between international air and space law, I will focus on space tourism in the suborbital phase. Before engaging into that legal discussion it may be useful to draw the attention to relevant facts illustrating the topicality of the subject.

On April 28, 2001, Dennis Tito, a California-based multi-millionaire, has been called 'the first ever space tourist'. Upon his successful trip in a Russian Soyuz capsule, Tito proved that travelling beyond earth's gravity was possible. Other significant events include the first private sector human commercial rocket launch on 8 April 2004, the successful flight of SpaceShipOne made by Mike Melvill on 17 June 2004, and various other flights which were operated in 2001, 2002 and 2005. Such flights were carried out, not only for the purpose of developing tourism, but also conducting research²⁾.

2) See: www.space.com/spacetourism

SpaceShipOne merits special attention as it won a prize in 2004 because of its design and technical capabilities³⁾. As I am writing this article for a Professor appointed at a broadly oriented university which is not only specialising in law and policy but also technical features of aviation, I may add that the SpaceshipOne vehicle uses nitrous oxide as the oxidizer and rubber (hydroxyl-terminated polybutadiene) as the fuel source. This spacecraft also has unfolding and folding wings as explained as follows:

"In space, the wings are folded up to provide a shuttle-cock or "feather" effect to give the ship extremely high drag for reentry. This allows the reentry deceleration to occur at a higher altitude and greatly reduces the forces and heating on the structure. Also, the ship, in the feathered configuration, will align itself automatically such that the pilot has a less-critical flight control task. We refer to this as "care-free reentry". The atmosphere orients the vehicle to a belly-first attitude without pilot input. Another benefit is that, since the altitude is higher, the pilot can glide further after the entry deceleration. A SpaceShipOne pilot can glide more than 60 miles after he converts back to the non-feathered glider shape⁴⁾."

The construction of SpaceShipOne is to be followed by the SpaceShipTwo, which was developed by Scaled Composites and Virgin Galactic. SpaceShipTwo could carry up to nine tourists to the edge of outer space, which flights are scheduled for 2008. The tourists on

3) The "Ansari X Prize" see: www.xprizefoundation.com

4) As to which see: <http://www.scaled.com/projects/tierone/faq.htm>

board will be the first true - near - space tourists⁵⁾. eportedly, these persons pay as much as 200,000 US\$ per "ticket".

A recent space tourism industry study showed that space tourism could generate more than 1 billion US\$ per year in revenues by 2021. The study also found that suborbital flights will constitute the biggest share of this emerging market, with the potential for 15,000 passengers and 700 million US\$ in revenues per year. Orbital flights were found to possibly include up to 60 passengers and generate 300 US\$ million per year. These figures may have legal relevance as they may impact upon a discussion of the applicable liability regime (as to which see below).

2. Suborbital flights in relation to the Chicago Convention

The above mentioned SpaceShipOne is operated and developed by Scaled Composites and Virgin Atlantic. In accordance with its physical and operational capabilities, it is deemed to be an aircraft from take off until it is released from a launcher aircraft, at which moment it becomes a spacecraft. The craft returns to earth as an aircraft.

Hence, it can be considered as a "hybrid" craft⁶⁾—which qualification raises legal questions, as to which see below.

5) See: Darcy Beamer-Downie, lawyer at Beaumont and Son aviation at Clyde and Co, London, UK: A Brief Introduction to Space Tourism, paper presented at the 25th annual Aviation Law Association of Australia and New Zealand (2006)

6) See: Darcy Beamer-Downie, lawyer at Beaumont and Son aviation at Clyde and Co, London, UK: A Brief Introduction to Space Tourism, paper presented at the 25th Annual Aviation Law, at p.8

As confirmed by the constitution of international civil aviation, laid down in the Chicago Convention, air law applies to *aircraft* navigating in airspace. In the words of articles 1 and 2 of the Chicago Convention, a state exercises "complete and exclusive sovereignty" on its territory, including the airspace above such territory⁷⁾. Neither the Chicago Convention nor any other international agreement, including any of the treaties regulating outer space and activities related to it, defines the upper borders of airspace.

Consensus appears to exist on delimitation between 80 and 120 kilometres above the surface of the earth. In an exceptional case, namely, Australia, national law defines the demarcation between airspace and outer space – in this case at 100 kilometres above the surface of the earth⁸⁾.

The Chicago Convention is concerned with the operation of aircraft in *airspace* – whether national or ‘international’airspace, that is, the airspace above the high seas⁹⁾. That makes the qualification of SpaceShipOne as an aircraft – or not – relevant.

The Chicago Convention does not define aircraft. Annexes made by ICAO to the Chicago do supply a definition. In accordance with the

7) See: Article 1 on Sovereignty

"The contracting States recognize that every State has complete and exclusive sovereignty over the airspace above its territory."

And Article 2 on Territory

"For the purposes of this Convention the territory of a State shall be deemed to be the land areas and territorial waters adjacent thereto under the sovereignty, suzerainty, protection or mandate of such State."

8) See, the Australian Space Activities Act No 123 of 1998, as amended by the Space Activities Act No 100 of 2002

9) Which is regulated by, amongst others, Article 12 of the Chicago Convention which reads as follows:

"Over the high seas, the rules in force shall be those established under this Convention." – including the Rules of the Air laid down in Annex 2 of ICAO.

definitions listed in for instance, Annex 6 containing rules on the *Operation of Aircraft*, an aircraft is defined 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."

Hence, the flight of a craft must be supported by the gaseous elements of the atmosphere –without which it cannot fly. That is why the above mentioned demarcation between airspace and outer space has been adopted: at altitudes above 120 kilometres above the earth's surface, such gaseous elements are missing.

Most national legislations are using this definition, or similar formulations. However, and, interestingly, the German aviation act considers spacecraft, missiles and similar spaceships as aircraft as long as they find themselves in (German) airspace¹⁰). This definition has interesting legal implications, as to which see also below.

For instance, a craft flying from the earth surface to the edge of outer space would, if it is subject to the German Aviation Act, be subject to the provisions of the Chicago Convention regulating navigation of aircraft in national or international airspace. Such a perspective might, for instance, grant freedom of transit through the airspace of other states in relation to the operation of non-scheduled flights¹¹).

10) See Article 1(1)(2) of the German Aviation Act (Luftverkehrsgesetz of 1999, as last amended in 2006): "Raumfahrzeuge, Raketen und ähnliche Flugkörper gelten als Luftfahrzeuge, solange sie sich im Luftraum befinden."

11) As permitted under Article 5 of the Chicago Convention regarding the Right of non-scheduled flight:
"Each contracting State agrees that all aircraft of the other contracting States, being aircraft not engaged in scheduled international air services shall have the

In conclusion, there are reasons to regard Spaceship One as an aircraft – at least as long as it flies in airspace. This consideration brings aviation law based provisions regarding the operation and navigation of the craft in question into play. As shall be seen below, such a conclusion may also be relevant for a discussion of the question pertaining to the establishment of liability of the operator of SpaceShipOne. Before proceeding to that discussion, the applicability of space law treaties to space tourism will be addressed.

3. The application of space law treaties to space tourism

Spacecraft as such is not defined under international space law. The Convention on *International Liability for Damage Caused by Space Objects* of 1972 – henceforth referred to as: the Liability Convention (1972) – regulates damage caused by "space objects" without defining the term. The Liability Convention (1972) – merely – states that a space object is deemed to include "component parts of a space object as well as its launch vehicle and parts thereof¹²⁾. The same definition is included with the *Convention on Registration of Objects Launched into Outer Space* of 1975. The *Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space* of 1968 speaks of "spacecraft" without defining it¹³⁾.

right, subject to the observance of the terms of this Convention, to make flights into or in transit non-stop across its territory and to make stops for non-traffic purposes without the necessity of obtaining prior permission, and subject to the right of the State flown over to require landing."

12) See Article I(d)

13) See Article 2

As stated above, international space law does not define the term "outer space". Obviously, space tourism is an unknown activity under the international space treaties.

At the time when the space treaties were drawn up, space activities concerned research, exploration and use of outer space –rather than exploitation of outer space for the purpose of developing tourism there. However, nothing prevents us from applying the term "use of outer space" to activities related to tourism - as this can be seen as a "use of outer space" as defined under Article I of the *Treaty on principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies of 1968*, henceforth referred to as: the Outer Space Treaty.¹⁴⁾

However, whether tourism can be seen as an activity which is carried out "for the benefit and in the interests of all countries, irrespective of their degree of economic or scientific development,"¹⁵⁾ is yet another question. This issue will not be explored in the context of this brief essay as this would require an interpretation of the used terms and an analysis of the binding nature of the involved provisions for the states whose nationals are participating in space tourism, including but not limited to states involved with the operation of Spaceship One.

Under international space law, people travelling from the earth to outer space and back are identified as: "envoys of mankind", "astronauts",¹⁶⁾ "personnel of a spacecraft"¹⁷⁾ or as "persons on board

14) See Article I of the Outer Space Treaty

15) See Article I of the Outer Space Treaty

16) See Article V of the Outer Space Treaty

17) See Articles 1 and 2 of the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space of 1968

... a space object"¹⁸). Other categories, including for the reasons set out above, are absent.

In short, the combined effect of two factors seems to be in favour of, or at least do not prohibit the operation of space tourism into outer space. *Firstly*, space tourism was not thought of at the time when the international space law conventions were drawn up some four decades ago. *Secondly*, whereas international air law is based upon national sovereignty requiring explicit permission of foreign states for the operation of air transport activities, international space law proceeds from a rather free regime for activities carried out there as all activities are permitted as long as they benefit mankind.

The Outer Space Treaty lists other conditions which participating states must comply with when carrying out activities in outer space, including but not limited to compliance with international law¹⁹) and the undertaking regarding the prohibition to place nuclear weapons or any other kinds of weans of mass destruction in outer space.²⁰) An analysis of these commitments falls outside the scope of this paper.

In short, while acknowledging the freedom of states to explore and use outer space for peaceful purposes, the Outer Space Treaty places responsibility upon *states* when carrying out activities in outer space. The continued use of – the edge of – outer space for space tourism without protests from states that have signed and ratified the Outer Space Treaty may contribute to the legality of that activity.

18) See Article IV of the Liability Convention

19) See Article III of the Outer Space Treaty

20) See Article IV of the Outer Space Treaty

4. Potential candidates for liability regimes applying to space tourism

Introduction

The above observations demonstrate that the battle between international air law and international space law has yet to be decided in relation to the present subject matter.

Arguments can be found for the application of either regime. Consequently, this section will look at the basis liability regimes from both bodies of law, to wit:

- the Montreal Convention of 1999, which is gradually replacing the Warsaw Convention of 1929, as variously amended; and
- the Liability Convention (1972),

While contractual relations may also play a role.

4.2 Liability under international space law

4.2.1 The Outer Space Treaty (1969)

As stated above, the Outer Space Treaty vests states with responsibilities when carrying out activities in outer space²¹). Such responsibilities may result into liability, when following the rule drafted by to the International Law Commission (ILC). This rule stipulates that

21) As confirmed by Article VI:

"States Parties to the Treaty shall bear international responsibility for national activities in outer space, including the Moon and other celestial bodies, whether such activities are carried on by governmental agencies or by non-governmental entities, and for assuring that national activities are carried out in conformity with the provisions set forth in the present Treaty. The activities of non-governmental entities in outer space, including the Moon and other celestial bodies, shall require authorization and continuing supervision by the appropriate State Party to the Treaty." (italics added)

a state committing, through its agents acting in their official capacity, an internationally wrongful act, incurs responsibility and:

"...is under an obligation to make full reparation for the injury caused by the internationally wrongful act."²²⁾

If the inaccurate performance of space tourism, falling under the responsibility of a state, acting through a private operator which should then be considered as an "agent", can be qualified as an "internationally wrongful act", the above rule of the ILC could lead to liability of the – delegating – state.

The Outer Space Treaty addresses liability in a more specific manner. Again, liability is attached to states, and not to private operators. Liability is absolute, and without limits.

A state is liable "for damage to another State Party to the Treaty or to its natural or juridical persons" caused by a space object or its component parts on the earth, in air space or in outer space, including the moon and other celestial bodies²³⁾. This appears to exclude damage caused to a natural person *on board* spacecraft, whereas it does not address damage which is not caused by the space object – such as Spaceship One or Space Ship Two – to the persons on board such space ships. For instance, if Spaceship One is hit by a space debris,

22) See Article 31(1) of the Articles of the International Law Commission on State Responsibility

23) See Article VII of the Outer Space Treaty:

"Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the Moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the Moon and other celestial bodies." (italics added)

the resulting damage does not seem to fall under state liability as regulated under the Outer Space Treaty.

The above situation is not as hypothetical as it may seem. On 27 March 2007, a Russian satellite fell down from orbit into the Pacific. Two airlines – one of LAN Chile and one of Aerolíneas Argentinas were nearly hit by the space debris. So it can happen.

4.2.2 The Liability Convention (1972)

Obviously, the Liability Convention (1972) comes to mind when discussing liability in the context of space tourism. Again, it is useful to recall the full title of this convention which reads: *Convention on International Liability for Damage Caused by Space Objects*. Hence:

- there must be an international element;
- the damage must be caused by a space object.

This is further articulated in Articles II and III of the Liability Convention (1972).²⁴⁾ The last mentioned convention explicitly specifies that liability shall be "absolute" – as opposed to the aforementioned Outer Space Treaty which does not refer to the term "absolute liability". However, the formulation of the concerned and above quoted provision (see article (VII)) appears to – implicitly – introduce – absolute state liability.

Consequently, if the Russian satellite had hit the Chilean or the Argentinean aircraft in the incident briefly reported in the previous subsection, the Russian Federation could be made subject to "absolute

²⁴⁾ See, Article II

"A launching State shall be absolutely liable to pay compensation for damage caused by its space object on the surface of the earth or to aircraft flight."
(italics added)

liability" under the Liability Convention (1972) for the resulting damages. The Russian Federation is a party to this convention.

In the event of an accident between two space objects, liability for damage under the Liability Convention (1972) is based upon fault.²⁵⁾ "Again, there are no limits of liability.

Damages include, and are probably limited to loss of life, personnel injury or other impairment of health; or loss of or damage to property of states or of natural or juridical persons. The term "personal injury" is rather broad as compared with the term "bodily injury" used in private air law conventions, as to which see the next sub-section. The terms have never been interpreted in case law.

The Liability Convention states that state liability arises in case the damage is caused by "its" space object (see Article II), or by the space object "of" another state (see Article III). The link between the state and space object is not defined – in which context thought could be given to a similar question under the Chicago Convention, referring at several instances to an airline "of" a contracting state.²⁶⁾ It is – and probably has always been – assumed that the link between the space object and a state is established by Article I of the Liability Convention – a premise which is confirmed by the Convention on Registration of Objects Launched into Outer Space (1975), and, more implicitly, the Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (1968). Hence, the state "which launches or procures the launching of a

25) Pursuant to Article III:

"In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.

26) See for instance Articles 7 and 87 of the Chicago Convention

space object", or a state "from whose territory or facility a space object is launched" is liable for the mentioned damages.²⁷⁾

This is perhaps not always the most efficient or desirable choice. Alternatives for the establishment of a link between a space object and a state are registration, licence and principal place of business of the operator of the space object. A further discussion of this subject falls outside the scope of the present essay.

In the light of the quoted provisions (Articles II and III) of the Liability Convention (1972), damages caused by an accident between two or more space objects inflicted upon space tourists would have to be paid by the state or states which launched the space object and caused the damage through its or their fault. It seems that damages caused under other conditions are not covered by international space law. For instance, if space tourists suffer damages as a consequence of space debris hitting the space ship which carried them to the edge of outer space, or physical conditions inside the space ship, such damages cannot be recovered under international space law.

Also, procedures are not easy. Claims "may" be presented by the state whose national suffers damage to the launching state "through diplomatic channels", raising the matter to a non-legal, that is, political level, with all the inconveniences of that level.²⁸⁾

In case no solution is found via diplomatic channels, recourse may be had to a Claims Commission, which can be formed as an *ad hoc* body.²⁹⁾ Lack of practice and case law shed a light on the practicality or lack thereof of this remedy.

27) See Article I(c) of the Liability Convention (1972)

28) See Articles VIII and IX of the Liability Convention (1972)

29) See Article XV of the Liability Convention (1972)

4.2.3 Conclusions

Space tourists flying on SpaceShipOne (or Two) from the earth to the edge of outer space are not always well served by the liability framework set up by international space law conventions. On the positive side, their claims may include all personal injuries, which is a broad term. There are no liability limits. However, the causes of the damage may prevent them from making a claim as such causes are relatively narrowly defined.

Procedures are cumbersome. Claims are handled at state level, which may complicate judicial settlement.

The question can be asked whether a claimant – space tourist – is prevented from seeking redress of its damages via local remedies and local law. This issue may be addressed in the contractual arrangements made between the space tourist and the operator of the space object, such as Virgin Galaxy.

A related question concerns the exclusivity of the substantive and procedural provisions of international space law which has yet to be tested. International space law is a matter of public law that is, governing relations between states, and not between private parties. As the next section will demonstrate, this is different for international air law.

4.3 Liability under international private air law

4.3.1 Introduction

In international carriage by air, liability is regulated on a different footing. The liability regime has so to say been "privatised" as private operators can be sued directly by private claimants under treaty law. This is the great merit of the drafters of the Warsaw Convention

regulating civil liability between airline and passenger at a time when air transport was still considered as an adventure – perhaps as much as space tourism is now, or at least in a couple of years from now.

The Warsaw Convention has been amended a number of times, for instance and principally by The Hague Protocol of 1955 under which the modest liability limits set by the Warsaw Convention - amounting to approximately 10,000 US\$ per passenger per accident –were doubled. In 1929, liability was subject to a relatively low ceiling as the airline industry had to be protected as an infant undertaking. Sixty years after, the Montreal Agreement of 1999 abolished limits for passenger liability.

가) 4.3.2 The Warsaw Convention (1929) as variously amended

The Warsaw Convention applies to "all international carriage of persons, luggage or goods performed by aircraft for reward."³⁰⁾ The Warsaw Convention does not define the term 'aircraft'.

The term "international carriage is rather cryptically defined under paragraph 2 of the same provision as:

"... any carriage in which, according to the contract made by the parties, the place of departure and the place of destination, whether or not there be a break in the carriage or a transshipment, are situated either within the territories of two High Contracting Parties, or within the territory of a single High Contracting Party, if there is an agreed stopping place within a territory subject to the sovereignty, suzerainty, mandate or authority of another Power, even though that Power is not a party to this Convention. A carriage without such an

30) See Article 1(1)

agreed stopping place between territories subject to the sovereignty, suzerainty, mandate or authority of the same High Contracting Party is not deemed to be international for the purposes of this Convention."

Applying the above conditions to tourists being carried between a point on the earth, for instance, in Arizona, U.S., and a point in the edge of outer space, and back to the same point in Arizona, U.S., and proceedings from the ratification of the Warsaw Convention, 1929, by the U.S. (which indeed is the case), the result may be seen as follows:

SpaceShipOne carries "persons" for reward. Whether SpaceShipOne can be termed an "aircraft" has yet to be determined. The answer to that question depends on the physical characteristics of the craft in question, and on the applicable legal regime. Reference is made to the brief discussion of the ICAO definition of aircraft and provisions of international law in section 2 above.

The Warsaw Convention is applicable to *international* carriage only. A "return flight" between a point in Arizona U.S., a point on the edge of outer space and the same point in Arizona, U.S. can only be viewed as "international carriage" under the provisions of the Warsaw Convention if, proceeding from the U.S. ratification of the Warsaw Convention (which is a matter of fact) "there is an agreed stopping place within a territory subject to the sovereignty, suzerainty, mandate or authority of another Power".

The last mentioned condition raises two questions regarding the applicability of the Warsaw Convention:

- Can a point in the edge of outer space be regarded as an "agreed stopping place"? and, if so, even more complicated:
- Can that point be deemed to be located "in a territory subject

to the sovereignty, suzerainty, mandate or authority of another Power"?

The answer to the second question could be no. A point in outer space, or on the edge of outer space, does not fall under the jurisdiction of any state. This follows from Article II of the Outer Space Treaty, proclaiming that "Outer Space is not subject to national appropriation by claim of sovereignty " .

This said, other factors, such as the question whether 'the edge of outer space' belongs to outer space or to the national airspace of the underlying state, and the question of a stopover or break at an international space station falling under the jurisdiction of a state, may fine tune this answer to the above second question.

There are alternative arguments for the applicability of the Warsaw Convention of 1929. If the place of departure and the place of destination, whether or not there be a break in the carriage, are located within the territories of two different states party to this convention, it may be applied to the carriage in question. If SpaceShipOne starts its flight in Arizona, U.S., and if it is agreed that it returns to a point in Mexico, place of origin and place of destination are located in the territories of two different states, namely, the U.S. and Mexico - in which case the carriage in question is "international" as defined under Article 1(1) the Warsaw Convention. A 'stopover' in a point at the edge of outer space may or may not be regarded as 'a break in the carriage'- but the answer to that question does not affect the applicability of the Warsaw Convention of 1929.

Assuming that all other conditions are fulfilled, including the qualification of the SpaceShipOne as an 'aircraft', provisions on liability may be appealed to. The essence of the liability regime of the Warsaw

Convention of 1929 is laid down in Article 17, proclaiming that the carrier – not the air carrier – shall be liable "for damages sustained in case of death or bodily injury of a passenger upon condition only that the accident which caused the death or injury took place on board the aircraft or in the course of any operations of embarking or disembarking."

This regime signifies quite a change. To begin with, the space tourist must be qualified as a "passenger". Arguments may be found in favour of such a qualification. Again, the terms "passenger" is not defined under the Warsaw Convention but he/she may be understood to be a (natural) person who has a contract with the carrier, stipulating, amongst other things that he/she is carried from A to B.

Admittedly, and this is on the negative side from the "passenger", the liability is ceiled under the Warsaw Convention to about 10,000 US\$ per accident per passenger. In addition, the scope of damages may be more restricted than under the Liability Convention (1972) as 'bodily injury' is narrower than 'personal injury'.

However, from a procedural point of view, the 'Warsaw Convention passenger' is (much) better off than the 'astronaut' falling under the regime of the Liability Convention (1972). The passenger is entitled to address his/her claim directly against the carrier. If no agreement on the settlement is reached, a number of jurisdictions are available to the passenger.³¹⁾

4.3.3 The Montreal Agreement (1999)

Save for the abolishment of liability limits, the changes brought about by the Montreal Agreement (1999) when compared with the

31) As listed –again rather cryptically – in Article 28 of the Warsaw Convention

above provision of the Warsaw Convention are not radical. The scope of application of this convention is the same.

Hence, if a passenger travels under a contract which may be made subject to the provisions of the Montreal Convention, 1999, he/she has a rather good deal. Perhaps not all damages are compensable. For instance, the award of mental injury if not identified as 'bodily injury' is questionable. The carrier is absolutely liable for claims up to 100,000 Special Drawing Rights of the International Monetary Fund (IMF) but it may exonerate itself for claims exceeding that ceiling.

Again, from a procedural point of view, the remedies are more efficiently organised under the Montreal Convention (1999). There is even one more jurisdiction available to passengers, namely, the court of their own domicile if specified conditions are met.³²⁾

4.3.4 Conclusions

Depending upon the availability of private air law instruments, passengers on board a SpaceShip One or Two may be entitled to remedies in relation to the operator of their SpaceShip. The availability depends on the satisfaction of principally two conditions, namely,

32) As to which see Article 33 of the Montreal Agreement (1999): Jurisdiction

(1) An action for damages must be brought, at the option of the plaintiff, in the territory of one of the States Parties, either before the court of the domicile of the carrier or of its principal place of business, or where it has a place of business through which the contract has been made or before the court at the place of destination.

(2) In respect of damage resulting from the death or injury of a passenger, an action may be brought before one of the courts mentioned in paragraph 1 of this Article, or in the territory of a State Party in which at the time of the accident the passenger has his or her principal and permanent residence and to or from which the carrier operates services for the carriage of passengers by air, either on its own aircraft, or on another carrier's aircraft pursuant to a commercial agreement, and in which that carrier conducts its business of carriage of passengers by air from premises leased or owned by the carrier itself or by another carrier with which it has a commercial agreement.

whether the carriage performed by the SpaceShip can be termed "international" –which is questionable, and whether the SpaceShip can be qualified as an aircraft.

Substantive and procedural remedies are well organised under private air law conventions. There is ample case law explaining the interpretation of terms used under these conventions, enhancing the transparency of rights and duties of passengers.

5. Final observations

International space law is public law. States are the only subjects of law. Private operators let alone their contractual counterparts such as the persons travelling on SpaceShipOne have no rights or obligations under the space law treaties.

That situation may reveal to be a flaw when space tourism becomes a mass industry, as predicted. For the time being, the few people travelling from the earth to a point in the edge of outer space and back must be capable of organising their entitlements under contracts with the operators of operators themselves – without backing of public treaties.

However, when the moment comes that space tourism becomes a reality for great numbers of people, states should intervene in favour of that industry by drawing up an international agreement laying down rights and obligations of the carrier and the passenger. Alternatively, present private air law conventions may be amended in order to draw up a framework for such a contractual regime, or they may be interpreted extensively - by special agreement - in order to submit space tourism to its scope.

In this regard, the Montreal Agreement, 1999, could be relied upon, as the liability limits of the Warsaw Convention as amended by The Hague Protocol are obviously ridiculous.

The two tiers unlimited liability regime set by the Montreal Agreement, 1999, may prove to be a better example to follow. Foremost should states withdraw from procedures between the operator of spaceships and their 'passengers'. Political considerations and public international law principles should not be allowed to play a role in that relationship; that is one of the reasons why space law treaties do not provide an adequate solution for liability claims in the context of space tourism.