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#### TOWARDS A NEW AEROSPACE CONVENTION ? - SELECTED LEGAL ISSUES OF "SPACE TOURISM" -

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### **ABSTRACT**

This paper analyses several basic aspects of passenger liability and proposes answers to "old" questions of public international space law which are likely to become relevant in the context of "space tourism". As various activities may fall under this broadly defined concept, this paper specifically undertakes to clarify to which extent existing instruments of private international air law may apply to "space tourism". Especially with respect to suborbital flights and "air launches", the authors propose practicable interpretations of the term "aircraft" as used in private international air law. The delimitation of airspace and outer space must be addressed to clarify the applicability of relevant legal principles. Here the authors submit that the example of the Australian national legislation of fixing an altitude for the beginning of outer space should be regarded as an encouragement for respective attempts at international level. Moreover, this paper argues that the introduction of a new instrument of private international law on space transportation may be desirable in the

future. The historical differences must at least partially be overcome in order to reconcile certain liability rules of air and space law.

#### **INTRODUCTION**

The term "space tourism" may be broadly defined as any commercial activity offering customers direct or indirect experience with space travel. The possible scenarios include long-term stays in orbital facilities (possibly with participation in research and entertainment). short-term orbital or suborbital flights, and parabolic flights in aircraft to expose tourists to - even short periods of weightlessness.<sup>1</sup> This prospect of the development of some kind of "space tourism" as a new branch of the space industry includes various technological, strategic and legal aspects that have raised the attention of States and private industry. The broad definition of space tourism makes it evident that issues both of air and space law will be of interest. Both legal regimes have developed largely separated from each other, with the exception of the discussion about the right of overflight for spacecraft.

Thus, in some respects legal principles of air and space law may even prove to be irreconcilable. The long and rather fruitless

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debate about a functional or a spatial approach to the determination of the application of space law reflects this situation, as no practical need for an agreement has existed so far.

However, new technological developments may force air and space lawyers to find common solutions to practical problems. The various forms of space tourism may even serve as a catalyst for the development of a future aerospace law.

Here several legal aspects should be clarified, such as the status of passengers, crew and vehicle, questions of intellectual property rights, especially copyright protection in outer space, as well as criminal and civil jurisdiction. The practical need to find common solutions may first arise in the area of liability, where legal clarity is of high importance for private actors.

Among the many problems involved with "space tourism", this paper focuses on some issues of liability of operators using suborbital vehicles to transport passengers for touristic purposes, which is especially the case of "air launch", i.e. the launch of space vehicles in the air using an aircraft as the launch platform. Furthermore, questions of third party liability will be adressed. Here clarification is needed as to which extent air law conventions are applicable to these activities, and how air and space law principles interrelate. These questions of liability may serve as a good example for common issues of an aerospace law and offer the chance to clarify some basic notions of air and space law. Finally, we will try to give a short outlook on possible future developments.

# PASSENGER LIABILITY

Questions of liability are of highest importance and may arise in various forms. The liability of the carrier vis-à-vis the passenger is essentially contractual. In international air law, this type of liability is governed by a body of private international law instruments, the so called Warsaw Convention system, and the Montreal Convention of 1999, that unify certain important aspects of liability. However, many aspects of private air law are not unified, resulting in the applicability of national conflicts of law rules and different national laws with the well-known and undesirable effects.

In space law, no international rules on passenger liability exist. When thinking about the applicable passenger liability regime in the field of "space tourism", it is therefore helpful to establish to which extent the unified rules of private international air law apply and, as a next step, to determine whether and how the existing "gaps" should be filled, and whether a convention on the "unification of certain rules relating to international carriage by aerospace" is needed. The different possible activities of "space tourism" should be kept in mind, since the applicable legal regime depends on the specific features of each case.

# International air law

In international air law, the "Warsaw system" consists of the original Warsaw Convention of  $1929^2$ and subsequent amendments and supplements, including intercarrier agreements. This private patchwork of legal instruments makes it difficult to establish which regime applies to a given case. To remedy this situation, it is the purpose of the Montreal Convention of 1999<sup>3</sup> to consolidate and modernize the different instruments. According to its Art. 1 (1), the Montreal Convention, like its predecessors, is applicable to "all international carriage of persons" by aircraft. In the field of "space tourism", the applicability therefore depends on the question whether the vehicle used for transportation can be considered as an

"aircraft", and whether the transportation is "international".

## The term "aircraft"

The term "aircraft" is not defined in the Montreal Convention or in any instrument of the Warsaw Convention system. Therefore, one must turn to the general principles of international public law for the interpretation of international treaties, as contained in the Vienna Convention on the Law of Treaties.<sup>4</sup> The ordinary meaning of the term "aircraft" is reflected in the Annexes to the Chicago Convention,<sup>5</sup> where the term is defined as "all machines which can derive support in the atmosphere from the reactions of the air".<sup>6</sup> This definition might therefore also be applied to the Montreal Convention."

The characterisation of vehicles thus depends on the exact technical features. Suborbital vehicles using rocket propulsion for thrust should not be regarded as aircraft. If a vehicle takes off vertically like a rocket. does not it "derive support in the atmosphere", though the vehicle may use the "reactions of the air" in the landing process. In these cases, the purpose as well as the launch (in contrast to a take-off, though the literal interpretation should not be pushed too hard) supports the conclusion that the vehicle should not be regarded as an "aircraft". Furthermore, the dangers involved in the operation of space vehicles may not justify the application of air law.

In the case of an "air launch", two objects must be distinguished: the aircraft itself and the space vehicle attached to the aircraft until the time of separation. As the passengers will stay on board of the space vehicle, it is submitted that the transportation on board the space vehicle before separation from the aircraft should be considered as a carriage by aircraft. Until the separation, of the combined time aircraft/space vehicle has the characteristics

of an aircraft in terms of technical functions, flight pattern and manoeuvrability. While connected, it therefore also derives "support in the atmosphere from the reactions of the air". After separation, the "space vehicle" can clearly not be considered to be an aircraft any longer, thus making the Montreal Convention inapplicable to the second part of the journey on board the space vehicle.

For the "aerospace plane", a functional approach – arguing that these activities can be regulated by reference to their nature – has been proposed. If the vehicle uses outer space only "in transit" between two points on the earth, it might be possible to apply a broad interpretation *de lege ferenda*, and the vehicle could be treated like an aircraft.<sup>8</sup>

# "international carriage"

The Montreal Convention of 1999 is applicable to "all international carriage of persons" by aircraft.<sup>9</sup> A carriage by aircraft is international if "according to the agreement between the parties, the place of departure and the place of destination, [...] are situated [...] within the territories of two States Parties [...]."<sup>10</sup> It is submitted that in case of an air launch, the Convention is applicable to the first part of the carriage, as the position where the separation takes place would constitute a "place of destination", provided that this place of destination is located in a different State to make the carriage international. The determining factor for both the nature of the "place of destination" and of the internationality of the carriage is the contract made by the parties. Emphasising this subjective view, there is no compelling argument for a narrow interpretation. The carriage by aircraft ends at the time of separation. Consequently it is convincing to accept this point of separation as the "place of destination" of the carriage by aircraft. Therefore, this place is not necessarily a place on the ground.

If the separation takes place over a territory not under the jurisdiction of a signatory of the Montreal Convention, or over an area not under the jurisdiction of any State, e.g. over the High Seas, the carriage cannot be regarded as international under Art. 1 (2). The Montreal Convention would be inapplicable. The applicable liability regime would have to be determined in accordance with the principles of private international law.

However, this result cannot be considered to be satisfactory, as it makes the Convention applicable only to a part of the journey. Other solutions are therefore required.

#### International space law

In international space law, the Liability Convention of 1972 in its Art. II establishes a regime of absolute liability of the launching State for damage on the surface of the earth or to aircraft in flight caused by the "space object" of a launching State. According to Art. III of the Liability Convention, if the damage is being caused elsewhere than on the surface of the earth to a "space object" or to persons or property on board, the launching State is liable if the damage is due to its fault. Though private space activities can involve the same risks and dangers as space activities conducted by public bodies, the international legal regime governing space activities is mainly a public law regime which cannot directly bind private actors.<sup>11</sup>

Passengers of a space object cannot claim compensation under the Liability Convention. The Convention does not apply to damage caused by a space object of a launching State to nationals of this State and to "foreign nationals during such time as they are participating in the operation of that space object [...]".<sup>12</sup> The requirement that the foreign nationals must be "participating in the operation" of the space object might on the one hand support the conclusion that the Liability Convention applies, as passengers are usually not involved in the operation of the spacecraft. However, the passengers voluntarily put themselves at risk by participating in a space mission and should therefore not benefit from the provisions of the Liability Convention. Passengers and crew members of manned space missions are therefore not protected by the provisions of the Liability Convention.<sup>13</sup>

If the Liability Convention is inapplicable, liability must be established in accordance with national laws. Furthermore, the Liability Convention only applies to claims by one State against another State, natural and legal persons must turn to remedies of private (national) laws.

This exclusion has been criticised, as the protection of passengers is paramount for the success of the space industry.<sup>14</sup> On the other hand, in a possible future era of purely commercial space transportation, the responsibility and liability of States may become less acceptable.<sup>15</sup> Therefore, it must be considered whether a new international legal instrument is required to address the issue of passenger liability.

### THIRD PARTY LIABILITY

The Rome Convention of 1952 as amended<sup>16</sup> provides that the operator of an aircraft is liable for damage caused to third parties on the ground. Any person who suffers damage on the surface, upon proof that the damage was caused by an aircraft in flight, is entitled to compensation without a need to prove fault. Currently, the Legal Committee of the International Civil Aviation Organisation is considering proposals for a modernization of the Rome Convention which would introduce liability principles similar to those of the Montreal Convention of 1999 on passenger liability.<sup>17</sup> In space law, the liability of the launching State for damage caused by its "space object"\_is unlimited, absolute and provides for full compensation. However, it depends on the political will of the State whose natural persons suffer damage to present the claim to a launching state.<sup>18</sup>

A harmonization of both legal regimes could be considered, as a clear-cut distinction between the regimes may not always be possible and the principle of State liability may be outdated in an era of private space activities.<sup>19</sup>

### Other private international law

While the Montreal Convention and its predecessors apply to certain aspects of air transport, many other issues of private air law are not unified. The rules of private international law/conflict of laws apply to determine the applicable national law on a case-by-case basis.

However, the application of these principles in outer space is not easy. In outer space, the principle of lex loci cannot be applied, as there is no law of the place. Furthermore, strictly speaking space objects do not have a nationality and are not part of a national territory.<sup>20</sup> Article VIII of the Outer Space Treaty establishes only that a State "on whose registry an object launched into outer space is carried shall retain jurisdiction and control over such object and over any personnel thereof', thus establishing some kind of quasi-territorial jurisdiction. Thus only "space objects" can be registered and jurisdiction and control can only be exercised over "space objects". There is no complete definition of a "space object", partly due to the unresolved debate about the delimitation of airspace and outer space.<sup>21</sup> The registration of an object in accordance with the Registration Convention is a strong indication that the vehicle is a space object.<sup>22</sup> It can be assumed that the term is used for any object that is launched or attempted to be launched into outer space, making the purpose of the activity the

decisive factor.<sup>23</sup> As there is no agreement on the delimitation issue, and no clear rule can be identified in international law, it is doubtful and depends on each case whether a suborbital vehicle can be considered to be a space object.

Even though according to Art. 17 of the Chicago Convention aircraft have the nationality of the State in which they are registered, they cannot be said to belong to the territory of the State of registration in every case either.<sup>24</sup>

It is suggested that a practicable solution would be to apply the law of the State of registration after take-off/launch and before landing to space objects<sup>25</sup> as well as to aircraft.<sup>26</sup>

In the case of an air launch, the aircraft should be registered in accordance with Art. 17 of the Chicago Convention, and the space vehicle should be registered as a "space object" in accordance with the Registration Convention if it is intended to reach outer space. The space vehicle only becomes a "space object" at the moment of its separation from the aircraft. as the separation should be considered the "launch". Other possible solutions<sup>27</sup> would be less practicable and might face the problem of possible dual registrations, a possible resulting in conflict of jurisdictions. The registering State of the aircraft could be a "launching State".

If the vehicle does – due to its technical features – neither qualify as an aircraft, nor – due to the mission profile – as a space object, no registration can take place. In the airspace or on the territory of a State, the vehicle is subject to the jurisdiction of that State. *Lex loci* therefore generally is the law of the overflown State. Other linkages could also be applied, such as the law of the place of departure, the law of the place of destination. Concurrent competences may also be claimed by other States with substantial interest in a controversy.<sup>28</sup>

# **Future developments**

Clearly, the current legal situation is not satisfactory. For example, the application of the Montreal Convention only to a part of the transportation in case of an air launch is not a convincing solution, as the very purpose of the Convention cannot be achieved if the applicable legal regime depends on fortuitous circumstances, *i.e.* the moment when an accident happens. It could therefore be advisable to introduce a new legal instrument of private international law similar to the Warsaw Convention for aerospace transportation.<sup>29</sup>

An extension of the existing instruments of private international air law to space transportation does not seem to be a viable option. These instruments are designed to meet the requirements of the airline industry with characteristics that are different from the specifics of space transportation. The adoption of air law could lead to more problems than solutions, given that the development of air and space law has taken different paths.<sup>30</sup>

*Bin Cheng* has stated that, *inter alia*, there must always be a felt need for the new rules before international treaty rules can be established.<sup>31</sup> As commercial passenger transportation to and through outer space currently does not occur on a larger scale, there does not yet seem to exist any practical need for new rules.

Though it may therefore be premature to suggest the adoption of new legal instruments, the discussion could orient itself along the following lines. Once demand for space travel has been proven, an international legal instrument could be developed similar to the Warsaw Convention of 1929. Several similarities seem to exist. In international air law at that time there was a perceived need to unify certain aspects of law, especially liability, to travelling public from protect the unreasonable contract clauses, and to limit

the liability of the carrier to protect an infant industry from potentially ruinous, possibly not insurable claims.<sup>32</sup> A public interest in passenger transportation by space vehicles may thus also justify a limitation of liability, considering the hazardous nature of this mode of transportation, and to protect the activities of the "space carrier".<sup>33</sup>

Especially the issue of insurance of space activities deserves closer attention in the future and could be a key to the success of the industry. The availability of insurance coverage for operators and passengers could significantly influence the decision whether and under which circumstances a liability limit would be appropriate.

However, as the risk of travel will have to be relatively small to attract customers, and as passengers will probably be able to purchase insurance, the need for a limitation of liability will have to be critically analysed.<sup>34</sup> Another option for governments could be to indemnify the operator for passenger claims. Furthermore, it should be taken into account that the liability limitations of the Warsaw Convention have been challenged in law and have been criticised for various reasons. Finally, industry currently does not seem to seek government protection from passenger liability.

With respect to third party liability, it should be considered whether the involvement of private operators in space transportation still justifies the sole responsibility and liability of States,<sup>35</sup> or whether the liability should attach to the private operator. The applicable liability regime would depend on a policy decision which largely depends on the assessment of the degree of hazard involved and the assessment of the degree of protection needed by passengers, third parties and industry. Given the different safety standards in aviation and space transportation, it must be concluded that the dangers involved in space activities are considerably higher. With the current system

of State liability, national space legislation is required in order to give States a right of recourse against the private operators or their insurers under national law.<sup>36</sup>

### **Other aspects**

Though liability is one important issue, the possible advent of "space tourism" raises a broad variety of further question which cannot be discussed in detail here.

Institutional aspects also need to be addressed. Both UN COPUOS and ICAO have the expertise to provide significant input. A cooperation of both organisations will be required.<sup>37</sup>

National legislation will have to specify the requirements for the permissibility of suborbital missions. Generally speaking, the use of national airspace is subject to permission. The Chicago Convention grants aircraft only certain rights to enter foreign airspace.<sup>38</sup> There is no right of innocent passage for space vehicles, as until now no customary international law seems to have developed to this effect.<sup>39</sup> In outer space, on the other hand, free passage is guaranteed by the provisions of the Outer Space Treaty. Especially for suborbital flights, a clear definition of airspace and outer space is therefore desirable in order to clarify up to which altitude a permission for overflight is needed.

In 2002, Australia amended the definition of a "launch" in its Space Activities Act which now stipulates that a launch from Australia will need only to be licensed if the launch vehicle and/or payload are intended to reach an altitude of at least one hundred kilometres above sea level.<sup>40</sup> Though national legislation cannot have a direct interpretation of influence on the international law, this step might be seen as an expression of a respective opinio juris.<sup>41</sup> Further developments need to be closely monitored to determine whether new customary international law emerges.

### **CONCLUSION**

Is there a development towards a uniform legal aerospace law regime? The advent of space tourism can be an opportunity to clarify "old" questions of international space law. The applicability of international space law to "space tourists" must be analysed and amendments to existing law should be considered. With an increase of suborbital flights, the delimitation of airspace and outer space becomes a matter of practical importance, as for example the applicable liability regime and the permissibility of missions depend on this question. Customary international law may be about to emerge. Clear rules are required, as in an environment of legal uncertainty the industry is not likely to develop. Issues of passenger liability will likely be of highest importance. In the long run, an instrument of private international space law may be necessary to unify rules of passenger liability. Lessons from air law should be learnt without disregarding the specific environment of outer space which might necessitate the development of new legal instruments.

It becomes evident that the new era of space flights will force both, air and space lawyers, to share their respective knowledge and expertise in order to either interpret existing legislations in the necessary flexible manner or even to come up with new international legal instruments combining air and space law conceptions.

As these issues deserve closer scientific investigation, Project 2001 Plus, a joint research project of the Institute of Air and Space Law, Cologne, Germany and the German Aerospace Center DLR, will dedicate a session of its Final Symposium in 2005 to specific common issues of air and space law.<sup>42</sup>

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<sup>3</sup> Convention for the Unification of Certain Rules for international carriage by air, done at Montreal on 28 May 1999, entry into force on 4 November 2003.

<sup>4</sup> Of 23 May 1969, entry into force: 27 January 1980, 8 ILM (1969), 679.

<sup>5</sup> Convention on International Civil Aviation, signed at Chicago on 7 December 1944, ICAO Doc. 7300/6 (1980).

<sup>6</sup> The "Definitions" sections of Annexes 6 (8<sup>th</sup> ed., July 2001), 7 (5<sup>th</sup> ed., July 2003) and 8 (9<sup>th</sup> ed., July 2001) to the Chicago Convention.

<sup>7</sup> Giemulla, in: Giemulla/Schmid, Frankfurter Kommentar zum Luftverkehrsrecht, Warschauer Abkommen [Frankfurt Commentary on Air Law, Warsaw Convention ], looseleaf, June 2004, Art. 1 WA, marginal note 26.

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<sup>9</sup> Art. 1 (1) of the Montreal Convention.

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<sup>12</sup> Art. VII of the Liability Convention.

<sup>13</sup> P. Malanczuk, *Haftung [Liability]*, in: K.-H. Böckstiegel (ed.), *Handbuch des Weltraumrechts [Manual on Space Law]*, Köln et al. 1991, p. 755 (791).

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<sup>16</sup> Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, signed at Rome on October 7, 1952, ICAO Doc. 7364; Protocol to Amend the Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, signed at Rome on October 7, 1952, Signed at Montreal on 23 September 1978, ICAO Doc. 9257.
<sup>17</sup> Draft Convention on Damage Caused by Foreign Aircraft to Third Parties, ICAO Doc 9832-LC/192.

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<sup>19</sup> S. Hobe, *op. cit.* in n. 8.

<sup>20</sup> B. Cheng, Studies in International Space Law, London 1991, p. 475 (482 et seq.).

<sup>21</sup> See Art. I (d) of the Liability Convention and Art.
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