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ARTICLE VI OF THE OUTER SPACE TREATY AND PRIVATE HUMAN ACCESS TO SPACE

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1. Introduction

The theme of the third Eilene Galloway Symposium on Critical Issues in Space Law was “Article VI of the Outer Space Treaty: Issues and Implementation”.¹ One of the main fields where Article VI needs to be analysed is that of private human spaceflight, commonly called ‘space tourism’.² This will be *the* private commercial space activity of the next era of spaceflight, and although the industry is not taking off as quickly as was thought until last year, expectations are still that in the next few years the first commercial flights for wealthy individuals seeking the thrill of going on a sub-orbital flight will take off. Therefore this paper analyses Article VI in the context of space tourism, to see if it will be able to adequately accommodate this activity while at the same time preserving the framework of state responsibility and liability designed in the Sputnik-era.

2. Article I of the Outer Space Treaty

Before turning to Article VI, it is important to set the scene by recalling the words of the first article of the first space treaty:

Article I of the Outer Space Treaty. It states in relevant part that:

*The exploration and use of outer space [...] shall be carried out for the benefit and in the interests of all countries [...] and shall be the province of all mankind.*³

The question this article raises is whether it contains a firm and enforceable legal principle or ‘merely’ a moral obligation. Of course it is hard to realise it in practice, because it is hard to concretely conceptualise ‘the benefit and interests of all countries’ or the ‘province of all mankind’. Would it mean for instance that space tourism should become ‘Spaceflight for Mankind’ in order to be a legally acceptable space activity? Looking at current price tags this hardly seems realistic. Does this mean that space tourism is illegal under the Outer Space Treaty? That would be pushing it too far, and after all, Article VI does open the door for private activities, which by nature are ‘for profit’. Perhaps it is then best to see whether space tourism will eventually make access to space cheaper, which will create a spinoff that is ‘beneficial’ for ‘Mankind’?

3. Article VI of the Outer Space Treaty

Discussing Article VI in the context of space tourism necessitates a full quote of its provisions:

States Parties to the Treaty shall bear international responsibility for national

¹ This paper is based on the presentation made by the author at the 3rd Eilene Galloway Symposium on Critical Issues in Space Law, held on 11 December 2008 in Washington DC. Copyright © 2009 by T. Masson-Zwaan. All websites have been accessed in May 2009.

² Even though I believe that the term ‘space tourism’ is not the ideal one, because the word tourism implies large groups of people going on a trip, and that will not be the case for space travel for individuals for the foreseeable future, I will use the term for the sake of convenience.

³ Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies, 18 UST 2410 (1967) (Outer Space Treaty).

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.

When activities are carried on in outer space, including the Moon and other celestial bodies, by an international organization, responsibility for compliance with this Treaty shall be borne both by the international organization and by the States Parties to the Treaty participating in such organization.

Many eminent scholars have written about the history of the drafting of Article VI, so I will just recall here that the agreed text was a compromise between States that wished not to allow private activities at all, and those that wished to permit such activities. The compromise was that private activities are allowed, on the condition that the appropriate state exercises authorisation and continuing supervision over the activities of its non-governmental entities.

It implies in fact an obligation of due diligence; the state must verify for instance that activities by its nationals do not present a danger to the public health or to the safety of persons and goods, that they are not inconsistent with the State's treaty obligations, do not pose any risk for national security or have a negative environmental impact, and that they do not pose significant financial risks.

Since private space activity is still in its infancy, this system has worked well. What can be observed in recent years is that a constantly growing number of States has come to the conclusion that it is wise for

them to adopt national legislation to bring the activities of non-governmental entities under their control. After all, they bear responsibility for those activities and can be held liable in case of damage. Even though the adoption of a licensing system under national law is not an obligation flowing from Article VI, it is certainly the recommended method of protecting the State's interests and exposure to liability risks.

4. Case study: space tourism

As mentioned in the introduction, space tourism was selected to provide a case study to test the suitability of Article VI to present and future needs. Space tourism is still considered one of the most promising private space activities in the short- and mid-term.

Evaluating the applicability and suitability of Article VI to space tourism is an opportunity to verify if the space treaties in general are still valuable and can be maintained as the basis for space activity in the future. It will also show if and to what extent there is a need to clarify and/or supplement them, for instance through national law, codes of conduct or via other means. Some authors suggest that the treaties are hopelessly outdated and should be binned altogether; others have suggested major amendments that would almost certainly mean the end of the space treaties as we know them. My belief is that the legal framework created after the launch of Sputnik is still extremely valuable and that it should be preserved.⁴

⁴ This was also the firm belief of Eilene Galloway, who sadly passed away a few months after the Symposium. She wrote to me in August 2008: "We need to explain what needs to be done to bring private space activities under the control of the space system we have. We need a code of conduct for the [100] nations that have ratified the '67 Treaty. I think the framers of Article VI were foresighted in anticipating the possibility of private ventures. If we can suggest the legal language for implementing Article VI, it would be a real contribution for the future."

Categories of space travel

There are basically three categories of space travel which are briefly outlined below:

Suborbital spaceflight

In sub-orbital spaceflight, orbital velocity is not achieved. After engine shutdown, 3 to 6 minutes of microgravity is achieved, after which the vehicle falls back to Earth and re-enters the atmosphere. Most current projects will offer this kind of space travel. Vehicles usually attain an altitude of around 100 km.⁵

Orbital spaceflight

In orbital spaceflight, orbital velocity must be achieved for the vehicle to keep flying along the curvature of Earth and not fall back to Earth. Orbital space flight is technically highly complex and therefore expensive. Providing orbital spaceflight for private paying clients is much more demanding than suborbital flight, both in terms of technology and cost, but is nevertheless envisaged by several ventures. This is also what the six tourists who went up to the ISS so far have experienced.

Intercontinental rocket transport

Intercontinental rocket transport implies a transit through space in order to substantially shorten the travel time from one point on earth to another. It is not a new idea⁶, but the technical challenges are

sky high in terms of the velocity and the amount of propellant required, and the need for robust thermal protection for re-entry. Cost is therefore prohibitive, at least for the mid-term.⁷

In the present paper I will address only sub-orbital space tourism, since the other two categories seem still so far away that it would not be wise, and premature, to try to fit them into a regulatory framework now.

A brief overview of providers of sub-orbital space tourism

In order to have a good understanding of the potential impact of 'space tourism', it is useful to give a broad overview of projects underway. On October 4, 2004, the birthday of the launch of Sputnik 1, the first private manned spacecraft exceeded 328,000 ft two times in 14 days, thus winning the 10M\$ Ansari X-Prize. The list of enterprises venturing into this new and promising market is surprisingly long, but many of them may never see the light of day and I will concentrate on the most well-known ones.

Space Adventures' trips to the ISS

In April 2001, the first commercial space tourist Dennis Tito spent six days in the Russian section of the ISS, after extensive training at the Star City complex.⁸ After him, five others were launched to the ISS on a Russian Soyuz; Mark Shuttleworth in 2002, Gregory Olsen in 2005, Anousheh Ansari in 2006, Charles Simonyi in April 2007 (and again in 2009) and Richard Garriott (son of a NASA astronaut) in October 2008. The price for a flight brokered by Space Adventures to the ISS on board Soyuz is now around \$35 million. Recent reports claimed that space tourism seats will be unavailable on Soyuz

⁵ Numerous different technologies are under consideration. Some concepts involve a horizontal take-off or 'launch' (sometimes from an aircraft), while others take off vertically. For landing, they can vary from aircraft to parachute, the main technology challenge being thermal protection during re-entry.

⁶ For an overview of legal issues of aerospace planes, see Tanja L. Masson-Zwaan, *The aerospace plane: an object at the cross-roads between air and space law*, in: *Air and Space Law: de lege ferenda* (Essays in Honour of Henri A. Wassenbergh), (T. Masson-Zwaan / P. Mendes de Leon, eds.), 247-261 (Nijhoff 1992).

⁷ See David Hoerr, *Point-to-point Suborbital Transportation: Sounds Good on Paper, But...*, at <http://www.thespacereview.com/article/1118/1>.

⁸ See <http://www.spaceadventures.com/>.

spacecraft for the next few years, since the International Space Station doubled its crew size up to six people in May 2009. However it is now reported that Cirque du Soleil founder Guy Laliberté may fly to the ISS in September 2009, as Kazakhstan cancelled its plans to send a trained cosmonaut.⁹ It is expected that after that, this form of space tourism will also continue. Spaceports are being planned in the UAE and Singapore

Virgin Galactic's SpaceShipTwo

The most famous space tourism enterprise is without doubt Virgin Galactic, the project of the flamboyant Sir Richard Branson. Despite earlier reports, Virgin Galactic is now expected to take off with commercial flights in 2012 at the earliest. The concept involves a launch of SpaceShipTwo in midair at 50,000ft from the mothership, an aircraft called WhiteKnightTwo. Its homebase will be Spaceport America in New Mexico, but flights are also planned from Kiruna in Sweden. The 2½ hour journey into space sells for US\$200,000 a seat, and hundreds of people have reportedly already signed up.¹⁰

EADS' Spaceplane

EADS unveiled its plans for a spaceplane at the 2007 Paris Airshow. EADS, unlike Virgin Galactic, is not planning to act also as the operator of the plane, it is just planning to build it. However due to funding problems it is now on hold.¹¹

⁹ See <http://www.space.com/missionlaunches/090403-space-adventures-future.html> and <http://uk.reuters.com/article/scienceNewsMolt/idUKTRE54C48520090513>

¹⁰ See <http://www.virgingalactic.com>. Up to 300 Virgin Galactic 'astronauts' could venture to space in the foreseeable future.

¹¹ See <http://www.astrium.eads.net/en/families/space-plane-tourism-flight-shuttle> and <http://www.flightglobal.com/blogs/hyperbola/2009/03/eads-astrium-puts-its-space-je.html>.

Xcor's Lynx

XCOR Aerospace is developing the two-seat Lynx suborbital spaceship. The spaceship intends to take off in 2010 and will be capable of flying several times each day.¹² Some say it may beat Virgin Galactic in being the first to start commercial operations.

Spaceports

The first commercial spaceport is Spaceport America, which is under construction in New Mexico.¹³ The US Government provides licences to build a number of spaceports across the country, and there are proposals for spaceports in various states. Plans for spaceports in the UAE and Singapore have also been announced. In Europe, a planned spaceport in Kiruna, Sweden has made an agreement with Virgin Galactic. Other spaceports are being planned in Scotland and France, although the latter (in Montpellier) is on hold. A spaceport is also being planned in the Netherlands Antilles.

5. Realities

It is certain that space tourism is going to happen. And, at the risk of sounding pessimistic, accidents are also going to happen.

The basic legal framework for private commercial space activity is in place, although the extent to which humankind would one day engage in commercial space tourism activities was not anticipated.

¹² <http://www.xcor.com/press-releases/2008/08-03-26-Lynx-suborbital-vehicle.html>.

¹³ For information on various planned spaceports: <http://www.spaceportamerica.com/>, <http://www.spaceportsingapore.com/>, <http://emiratesupdate.wordpress.com/2008/01/15/uae-spaceport/>, <http://www.ssc.se/?id=9500>, <http://www.spaceportscotland.org/>, <http://spatioportfrance.free.fr/>, <http://caribbean.spaceport.com/>.

More and more licensing systems are being put in place under national law, complementing the international legal framework, which will help to provide legal certainty and harmonised rules. Legal certainty is good for new industries as well as for passengers and third parties.

Mass tourism is probably still several decades away. When ticket prices come down to \$20-40.000, the numbers of passengers will certainly increase, as the prospect of experiencing weightlessness and observing the 'Blue Planet' from outer space is very attractive to many people.

For the immediate future, it will be only for the rich few, at considerable risk, liability for which they will be requested to waive, while insurance will not yet be available.

6. Needs

The multilateral space treaties elaborated within UNCOPUOS were formulated in the 'Cold War' era, when only a small number of countries had space-faring capability. They could not fully anticipate the extent to which humankind would one day engage in commercial space tourism activities. The Outer Space Treaty foresaw that private entities would one day engage in space activities, yet one of the most essential topics for private operators, namely their exposure to second- or third-party liability,¹⁴ is not addressed. Instead, the Treaty, as well as the Liability Convention¹⁵, only addresses liability at the level of the States involved. There is no cap on liability of operators, and no opportunity for passengers or third parties to present direct claims for compensation.

¹⁴ Second-party or contractual liability refers to liability of the operator vis-à-vis passengers and cargo, while third-party or non-contractual (tort) liability refers to liability for damage to persons or property on the ground, who have no contractual relations with the activities of the operators.

¹⁵ Convention on International Liability for Damage Caused by Space Objects, 672 UNTS 119 (1968) 24 UST 2389 (1972) (Liability Convention).

Thus, even though the Treaties maintain their relevance even after several decades, the existing international legal regime needs to be supplemented with additional and more specific rules.

A balance must be found between commercial and technological opportunities on the one hand and principles of international space law on the other, and between the interests of the State and those of private enterprise and passengers and third parties.

In essence, it is necessary to protect the legitimate interests of states and to ensure the safety of crew, passengers and third parties in a satisfactory way, without creating a regulatory overkill.

7. Does international space law or air law apply to space tourism?

A lot has been written about the legal aspects of space tourism.¹⁶ The UN space law treaties apply to relations between states in carrying out space activities. International air law conventions (Chicago, Warsaw, Montreal) deal with international carriage by air.

Many of the currently planned space tourism projects plan to operate from one

¹⁶ See for instance S. Hobe, G. Goh & J. Neumann, *Space Tourism Activities – Emerging Challenges to Air and Space Law*, in 33 *Journal of Space Law* 359 (2007), F. von der Dunk, *Passing the Buck to Rogers: International Liability Issues in Private Spaceflight*, in 86 *Nebraska Law Review* 400 (2007), S. Hobe, *Legal Aspects of Space Tourism*, *ibid.* at 439 and S. Freeland, *Up, up and ... Back: The Emergence of Space Tourism and its Impact on the International Law of Outer Space*, in 6 *Chicago Journal of International Law* 1 (2005). These articles contain extensive references to the majority of earlier publications in this field. See also T. Masson-Zwaan & S. Freeland, *Private Human Access to Space: legal challenges and possibilities*, presented at the 1st IAA Symposium on Private Manned Access to Space, May 2008, Arcachon, France (an elaborated version is to be published in *Acta Astronautica* under the title *Between Heaven and Earth: the legal challenges of human space travel*).

territory only. And as long as the vehicles 'take off' and 'land' in that territory, the likelihood of cross-border damage is limited, so in principle that State's *national* law will apply. Most ventures are planned to take place in the USA, for instance the Mojave desert. Here, no international element will be involved a state may determine whether it will consider the activity as an aviation or space activity under its national law.

The USA has developed a substantive body of rules governing private human spaceflight that is applicable until the end of 2012, possibly longer.¹⁷ A 'light touch' legal approach has been taken, and licenses from the FAA's Office of Commercial Space Transportation are mainly concerned with public safety, not so much with the safety of passengers (who are voluntarily engaging in a risky activity).

However there are other cases where the probability of an *international* element, and thus the applicability of international air or space law, is much less remote, for instance if and when Virgin Galactic would launch from Kiruna in Sweden. Countries in Europe are much smaller and so the risk of cross-border damage is much bigger. This could then lead to damage being caused by (the private entity of) one state to persons or property of another.

Before turning to a discussion of whether air or space law would apply in such cases, it must be noted that even though more and more states in Europe have enacted national space legislation creating a licensing system, most of these do not contain any specific rules on space tourism.¹⁸ Interestingly, the Dutch Act

contains a provision stating that it can be declared 'wholly or partly applicable to the organization of outer space activities by a natural or juridical person from within the Netherlands' (Sec.2.2.b). The explanatory note states: 'This might include the commercial organization of space tourism activities'.

What is worrying is that efforts at harmonisation are only just starting, and the risk is that we end up with a patchwork of rules that may lead to flags of convenience and forum shopping. Recently, the European Aviation Safety Agency (EASA), the European counterpart of the FAA, has declared its competence in regulating space tourism, limited to horizontal take-off concepts such as SpaceShipTwo, and has taken a less flexible approach than the FAA, basically considering these craft as aircraft requiring full certification at the start of commercial operations.¹⁹

Returning to the situation where an international element warrants the application of international law, the challenging question is whether we should apply air or space law to damage resulting from space tourism (what's in a name...!).

As is well known, space law is based on 'freedom of use', in the absence of sovereignty, whereas air law is based on the sovereignty of states over the airspace above their territory. This results in major differences in both regimes. In air law, passenger liability and liability of the operator towards third parties on the ground is laid down in an elaborate system

¹⁷ Code of Federal Regulations (CFR), Title 14, Chapter III, based on the CSLAA of 2004. Relevant parts are 14 CFR 401, 415, 431, 435, 440 & 460, at http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=6a5153b45a2675c8b05adfd8d7195483&c=ecfr&tpl=/ecfrbrowse/Title14/14cfrv4_02.tpl#300.

¹⁸ E.g. Norway, Sweden, the UK, Belgium, the Netherlands and France. An overview and texts are available at

<http://www.unoosa.org/oosa/en/SpaceLaw/national/index.html>. For the French law ('Loi no. 2008-518 du 3 juin 2008 relative aux opérations spatiales', JO (Official Journal) 129, 4 June 2008), see <http://www.senat.fr/dossierleg/pj06-297.html>. Its full implementation is expected in mid-2010.

¹⁹ See *Accommodating sub-orbital flights into the EASA regulatory system*, by J.B. Marciacq *et al.*, at www.congrex.nl/08a11/presentations/day1_S09/S09_05_Marciacq.pdf. See also Masson-Zwaan/Freeland, *supra* note 16.

of rules tested and clarified extensively by jurisprudence, while space law is based on a rudimentary state-based system of liability that has moreover never been put to the test in a court case.

So, should air law apply for part of the journey and space law at some (as yet undefined) point during the activity? Is the case different for suborbital flights and for orbital flights? And what about horizontal (aircraft) take-off as opposed to vertical (rocket propelled) take-off?²⁰ The application of two totally different regimes to one suborbital flight may be the result; this would be both unsatisfactory and impractical. Of course, ideally, a comprehensive and uniform 'hybrid' legal regime ('aerospace law'?) should cover the complete launch and return journey of private individuals. Such a regime may well require a new treaty, but we all know that the probability of being able to agree on a new treaty is not high nowadays and might well take decades.

Since there is a need to provide clarity to today's space tourism entrepreneurs and to safeguard the interests of all players involved, the second best, or interim solution would seem to apply space law to the entire suborbital flight, on the basis of the function of the vehicle or mission. Since the purpose of space tourism is to go to space, space law should be applied to the entire mission.

But, there is a but, and that is that appropriate clarifications and additions (perhaps based on the model of the US CFR/FAA) are made to supplement the provisions of the space treaties. And national laws should be harmonised as much as possible. This will require action at the international level, probably steered by UNCOPUOS, relying on the expertise and experience of ICAO, and at the regional level, e.g. by the EU.

²⁰ One can also wonder if the case is different for suborbital flights and for orbital flights, but as stated earlier, this article only addresses sub-orbital flights.

8. Article VI and space tourism

Having thus established a preference for the applicability of space law, there is a need to discuss some of the elements of Article VI in the context of space tourism, and to see what needs to be done to supplement or clarify the regime.

'National activities in outer space'

The state bears international responsibility for 'national activities in outer space'. It is not very clear what is meant by the term 'national activities'. Is reference made to activities of nationals, also if they are abroad? Does it refer to private companies registered or headquartered in its territory? Do the activities concerned need to take place in outer space, or have an effect in outer space? What about a ticket sales office for space tourism? Does that make the state where the sales office is registered or headquartered responsible? This would seem farfetched, as it would just concern the activity of selling tickets to go into outer space; the activity has no direct effect in outer space, it is not an activity 'in space'. Would the operation of a spaceport make the country where it is located or headquartered internationally responsible? Operating a spaceport also is not an activity 'in' space, so its operation would most probably not fall under Article VI, and thus a license under national space legislation would also not seem necessary under the various national space legislations. Operating a spaceline on the other hand could be construed as an activity 'in outer space' and Article VI would probably make the state of incorporation responsible. For operating a spaceline therefore, national space legislation would probably request a license. Nevertheless, we can observe that the term would benefit from clarification.

'Appropriate State Party'

The 'appropriate' state party has to authorise and supervise, however the

question is why the term 'appropriate state' is used instead of another. This is again a complicated question.²¹ Is it the state of nationality of a spaceline that is meant, or is it the launching state? But in that case, why use a different name? Can there be several 'appropriate states', like there can be several launching states? Can the appropriate state change, for instance if a spaceline is sold?

What must be kept in mind is that the purpose of Article VI is to provide for control by the state that is responsible, which is the main subject of this article. Again, clarification would be beneficial.

'Authorisation'

In order to authorise an activity, the company carrying out the activity must have a link with the authorising state. The establishment of a licensing system is one way of establishing an authorisation mechanism. But it is not the only way. The state decides, this is an internal affair. Lately many states have come to the conclusion that the establishment of a national licensing system is the most logical way of authorising space activities, but for instance France, a major space power, has functioned quite well without an explicit licensing system for many decades. And besides, as already mentioned above, even states that have enacted national space legislation did not always address space tourism or create a licensing system.

'Continuing supervision'

The issue of continuing supervision is of course closely linked to authorisation, and the best way seems for a state to include a mechanism of for instance bi-annual reviews once a license has been granted in

order to fulfil this obligation under Article VI. But again, this is not the only way, and states may also choose not to provide for a supervision audit under their national schemes. A license definitely facilitates supervision as it creates a direct link between the state and the private entity. Also, nothing is foreseen in Article VI about what 'continuous' implies, so for instance the frequency and the extent of the supervision are left for states to decide. Should the potential risk exposure be taken into account? Or new technological developments? Should the nature of the activity have an influence on the extent of supervision? For instance for telecommunications satellites in the geostationary orbit once every three years, and for the operation of a spaceline once every year? Again, we can see that Article VI imposes a rather general obligation on states and it is left to their discretion to give meaning to it – which may lead to a patchwork of differing national regulations. Here as well, harmonisation and guidance on how to fill in the obligation of Article VI seems desirable.

9. Problems with implementing Article VI

The question for states where private space activities, including space tourism, are (or will be) carried out, is how they should realise an adequate authorisation and supervision process, so that they can fulfil their obligations under Article VI of the Outer Space Treaty in a satisfactory way, avoiding uncontrollable exposure to international responsibility and liability. As stated above, not all states have implemented their obligations under Article VI in the same manner. The absence of objective evaluation criteria and standards does not facilitate the work, and in some countries the authorities in charge of the licensing process lack the necessary know-how to properly evaluate the activity, especially in smaller countries without a long history of space activities. For the US

²¹ See K.H. Böckstiegel, *The Term "Appropriate State" in International Space Law*, Proceedings of the 37th Colloquium on the Law of Outer Space 77 (1994).

government to assess whether an activity should obtain a license or not will thus be much easier than for the Dutch or Belgium government for example. These will often be obliged to hire external experts in order to carry out the necessary safety, financial and insurance audits. This is amplified by the fact that space activities in such countries will remain the exception rather than the rule for the foreseeable future, and therefore it is not economically feasible for them to build up and maintain such hi-tech expertise in-house.

The lack of harmonisation in legislations interpreting Article VI may lead to a wide variety of implementation methods.

Another problem that may severely impact the capacity of states to carry out a proper evaluation of a proposed space activity is the long arm of ITAR.²² The purpose of ITAR is to prevent international proliferation of US technology that may be critical to national security, and non-adherence to its provisions can result in huge fines. This may lead to the undesirable effect that a third state is unable to properly verify the implications of a proposed space activity under its responsibility because ITAR prevents the applicant from providing the information that will assure the government of the compliance of the activity.

And then of course we have not even started to address the problems that may arise for passengers of space tourism flights or third parties on the ground; the space treaties do not allow the victims to present a claim directly to the operator, claims must be presented by one state to another. Moreover, nationals of the launching state may be excluded altogether from presenting a claim under

Article VII of the Liability Convention. This provision was designed for astronauts on board of the launch vehicle of their own national state, but is inadequate for a paying passenger on board a commercial flight – even though for the time being passengers are required to sign an ‘informed consent’ letter waiving their right to claim for damages.²³

10. Solutions?

Efforts to harmonise national legislations are undertaken by the UNCOPUOS and this is a very good initiative, as ideally harmonisation must be a global effort.²⁴ An agenda item called “General exchange of information on national legislation relevant to the peaceful exploration and use of outer space” is considered under a multi-year work plan for the period 2008-2011, and a new Working Group on National Legislation Relevant to the Peaceful Exploration and Use of Outer Space has been established. The gathered information will allow all States, in particular developing States, to gain an understanding of existing national regulatory frameworks and could assist States in their efforts to establish their own national regulatory frameworks in accordance with their specific needs and level of development.

At the regional level as well such efforts should be continued, e.g. in Europe.²⁵

²² International Traffic in Arms Regulations, ITAR (22CFR120-130). see http://ecfr.gpoaccess.gov/cgi/t/text/text-idx?sid=a5d12a23a5dfe0e4495181703bdae79a&c=ecfr&tpl=/ecfrbrowse/Title22/22cfrv1_02.tpl. See for instance P.J. Blount, *The ITAR Treaty and its implications for US space exploration policy and the commercial space industry*, 73 JALC 705 (2008)

²³ See T. Knutson, *What is “Informed Consent” for Space-Flight Participants in the Soon-To-Launch Space Tourism Industry?* 33 JSL 105 (2007). It is questionable whether legal representatives of deceased space tourists will be bound by such letters.

²⁴ See for instance the Report of the Legal Subcommittee on its forty-eighth session, held in Vienna from 23 March to 3 April 2009, http://www.oosa.unvienna.org/pdf/reports/ac105/AC_105_935E.pdf at 22.

²⁵ Initial steps are being taken by EASA, see *supra* note 19, and ESA has issued a position paper and a press release on space tourism, but the EU has not yet expressed itself. See the ESA press release at http://www.esa.int/esaCP/SEM49X0YUFF_index_0.html, and the position paper at

As regards ITAR, a solution may be to conclude TAA's (Technical Assistance Agreements) that may allow the government to have access to the information, but this generally takes several months and in some states, a shorter term applies for applicants to receive a decision on their license application.²⁶

Apart from the necessary clarifications of the component concepts of Article VI ('national activities', 'appropriate state', 'authorisation', 'continuing supervision'), it is also necessary to complement the state-based responsibility and liability system of the space treaties.

Detailed rules governing second- and third-party liability are needed, and lessons may be learned here from the extensive liability provisions governing the international carriage by air under the Warsaw/Montreal/ Rome system.²⁷

The Warsaw Convention of 1929, as amended, provides for upper limits for liability in relation to the carriage of passengers and of baggage and cargo as well as dealing with areas of responsibility and insurance. Article 20(1) exonerates the carrier from liability where it or its servants and agents 'have taken all necessary measures to avoid the damage or that it was impossible for him or them to take such measures'.

The Montreal Convention of 1999 was designed to supersede the Warsaw

Convention and removed the system of arbitrary limits on air carrier liability, by providing that the carrier was liable for the full amount of the damages, unless it could demonstrate that it was not negligent or that a third party was solely responsible for the damage: Montreal Convention, art VI.

The Rome Convention on Damage Caused by Aircraft to Third Parties on the Surface and its Montreal Protocol of 1978, deals with third party liability in respect of commercial air activities. It is intended 'to ensure adequate compensation for persons who suffer damage caused on the surface by foreign aircraft, while limiting in a reasonable manner the extent of the liabilities incurred for such damage in order not to hinder the development of international civil air transport'. However the Rome Convention is not widely ratified because of its low limits and its relevance is negligible. In most cases, national law will determine the compensation to third parties on the ground.

Some other areas where space law might use provisions from air law are vehicle safety, the status of the crew, commander, and passengers, navigation (traffic, transit), security (criminal law), and of course liability (collisions, third parties, passengers). With these at its disposal, states will have the necessary tools to fulfil their obligations under Article VI.

The unintended extra-territorial effect of ITAR must also be reduced, but this will probably take time. Perhaps the conclusion of TAA's will help in the meantime, but it is also a responsibility of the US government to reduce the global negative effects of ITAR.

11. Conclusions

Safe, efficient private human access to space at reasonable cost will boost space activity, the global economy, and thus will benefit Mankind as a whole. Article I of the Outer Space Treaty therefore does not

http://esamultimedia.esa.int/docs/gsp/Suborbital_Spaceflight_ESA_Position_Paper_14April08.pdf.

²⁶ Under the Dutch Space Activities Act, the authorities are expected to give their decision within six months.

²⁷ Convention for the Unification of Certain Rules Relating to International Carriage by Air, Warsaw, 12 October 1929; Convention for the Unification of Certain Rules for International Carriage by Air, Montreal, 28 May 1999; Convention on Damage Caused by Foreign Aircraft to Third Parties on the Surface, Rome 7 October 1952. See for texts http://www.mcgill.ca/iasl/research/treaties/air_law/private/.

stand in the way of seeing space tourism as a legitimate use of space.

Article VI Outer Space Treaty sets the scene for state control of space tourism by posing a due diligence obligation on the state and imposing a state-based system of responsibility and liability.

Clarifications to this system are needed, as is harmonisation at the global and regional level. Also, additional rules are to be derived from air law in order to better equip the state to fulfil its obligations of authorisation and continuous supervision under Article VI, and to develop an adequate system of second- and third party liability.

A clear, functional, harmonized legal framework for space tourism is essential to safeguard the interests of the state and those of the private entities engaging in this great new leap for Mankind