

## LEGAL ASPECTS OF SPACE TOURISM

By

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### ABSTRACT

This paper analyses some important aspects of applicable international space law and some national laws that have direct relevance to space tourism. Legal lacunae are identified and suggestions are made with a view to encourage the development of this newest application of space technology.

### INTRODUCTION

It is a unique trait of human beings to be curious, to crave to know the unknown, to see the unseen, to unveil the mystic and to conquer the invincible, which attribute to their endeavor to moving from one geographic location to other, and this trait accounts for the birth of tour and travel, including space tourism.

Space tourism has a unique characteristic, which makes it distinguishable from any other fields of

Tourism. A visit to the International Space Station (ISS), or any other space stations leaving the human defined territories and crossing the undefined border between airspace and outer space, does not only give such visit an extra-territoriality character, but also makes its visitors a kind of representatives of the people from the planet Earth in a limitless universe.

Normally, tourists do not undertake trips to see the air or the water; they take advantage of these means to see other places. But a space tour is a tour to see and contemplate what outer space is. The feeling of weightlessness is an alluring feature of space tourism. More importantly, space tourism is a branch of tourism where the travelers' state of health is of prime importance. Thus, it is essential for a space tourist to undergo special and expensive medical fitness training and tests so that he/she could endure such an excursion or tour.

It can be asserted that because of several recent and significant technological developments, safe, reliable, and affordable transportation systems for space travel will become available within the next ten to fifteen years. The availability of such vehicles, meeting high standards of spaceworthiness, will encourage the initiation of commercial space lines and other space travel service providers for routine visits to outer space.

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From a market research project sponsored by the National Aerospace Laboratory, Japan, it came to light that “surveys of the world’s two largest consumer markets and supporting data from Europe, [show] that the price of a return ticket to low Earth orbit should be reduced to between US\$10,000 and US\$20,000 per person”, and further that “a market of the order of one million passengers per year, paying approximately US\$10,000 per person, would generate revenues of US\$10 billion per year.”<sup>1</sup> Therefore, space travel by ‘ordinary’ or “average” people could become possible in the near future. A study carried out by the World Tourism Organization Statistics Chief, Enzo Paci, points out that short pleasure voyages to outer space will become a reality by 2004 or 2005.<sup>2</sup>

The motivating factors, which will guide tourism of the 21st century are entertainment, excitement and education. The space tourism would be “neither a fantasy nor just a nickname for conventional manned space flights, but an economic activity based on public demand.”<sup>3</sup> Actual examples of birth of such an economic industrial activity are the space trips made by

Dennis Tito of the U.S.<sup>4</sup> and Mark Shuttleworth of South Africa.<sup>5</sup>

## POLICY AND LEGAL ISSUES

It has now been made clear by different studies that unless a definite regulatory framework exists it is difficult to promote space tourism. Several studies have been conducted by governments and private companies in search of a regulatory framework, which could serve as a platform or jumping board for the space tourism industry.

### Aviation regulations as a precedent:

It is generally accepted that the existing aviation regulatory framework, after adequate and appropriate modifications and reforms, is compatible to be extended for to space transportation.<sup>6</sup> A group of authors rightly observed that “In view of the trend under way to commercialize NASA's activities, it seems likely that the evolution of

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<sup>1</sup> P. Collins, R. Stockmans, M. Maita, Demand for Space Tourism in America and Japan and its Implication for Future Space Activities, 1995. For text see: [http://www.spacefuture.com/archive/demand\\_for\\_space\\_tourism\\_in\\_america\\_and\\_japan.shtml](http://www.spacefuture.com/archive/demand_for_space_tourism_in_america_and_japan.shtml) (accessed on 5.10.2002)

<sup>2</sup> Francesco Frangialli, “Crystal Ball Gazing”, Dossier, The Courier, May-June 1999, p. 2.

<sup>3</sup> Makoto Nagatomo *et al*, “Study On Airport Services For Space Tourism”, Proceedings of 6th IS COPS, AAS, For the text see: [http://spacefuture.com/archive/study\\_on\\_airport\\_services\\_for\\_space\\_tourism.shtml](http://spacefuture.com/archive/study_on_airport_services_for_space_tourism.shtml)

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<sup>4</sup> Lift off on April 28, 2001 on Soyuz TM-32; De-orbit burn completed at 12:47 a.m. EDT Sunday; Landing completed at 1:42 EDT Sunday, May 6, 2001. For more details see: <http://www.space.com/dennistito/> (accessed on 5.10.2002)

<sup>5</sup> Soyuz-TM34 rocket lifted clear of the launch pad at 0626 GMT from Baikonur, Kazakhstan and reached orbit eight minutes later. Soyuz capsule landed at 03.51 GMT. Also see: <http://cooltech.iafrica.com/spacetourist/news/935985.htm> (accessed on 5.10.2002)

<sup>6</sup> P. Collins and K. Yonemoto, “Legal and Regulatory Issues for Passenger Space Travel”, IISL-98-IISL-3.09, Proceedings of International Symposium on Space Law, 49th IAF Congress, p.1.

government space activities will belatedly follow the precedent of aviation, with governments' role being progressively cut back from operations to supporting research - and the majority of activities being passenger transportation."<sup>7</sup>

For the purpose of studying the range of legal and regulatory issues, other than those relating to vehicle certification, which are necessary to be resolved before the commencement of the space tourism industry, a new committee called "the Commercial Space Transportation Legislation Research Committee" was established in 1998 in Japan under the chairmanship of Mr. Y. Funatsu, an aviation consultant. On board this Committee are experts possessing extensive aviation operating expertise in advanced technological passenger carrying vehicle and in working for building a bridge between the rocket community and the civil aviation community. The Committee extensively studied the existing aviation regulations and airworthiness standards. This approach parallels with the work being carried out in the U.S.

Since 1996, the U.S. Federal Aviation Administration (FAA)'s Office of the FAA Associate Administrator for Commercial Space Transportation

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<sup>7</sup> P. Collins, K. Isozaki and R. Wakamatsu, "Space Tourism in Japan - the Growing Consensus", 2nd International Symposium on Space Tourism, 2nd International Symposium on Space Tourism, Bremen, April 21-23, 1999. For text see: [http://www.spacefuture.com/archive/space\\_tourism\\_in\\_japan\\_the\\_growing\\_consensus.html](http://www.spacefuture.com/archive/space_tourism_in_japan_the_growing_consensus.html) (accessed on: 26.9.2002)

(FAA-AST),<sup>8</sup> has been considering various forms of regulation of reusable rocket operations.<sup>9</sup> Several proposals concerning regulation of commercial facilities in orbit have been made to the FAA-AST,<sup>10</sup> which in turn felt the need of bringing in new regulations by 2005 to integrate space traffic and air traffic.<sup>11</sup> The FAA-AST is comprised of three divisions (a) Space system development (b) Licensing and safety

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<sup>8</sup> On October 1, 1995, the U.S. Department of Transportation (DOT) transferred control over the Office of Commercial Space Transportation (OCST) to the Federal Aviation Administration (FAA). William A. Gaubatz, "Comments on Certification Standards for New Reusable Launch Vehicles", FAA Office of Commercial Space Transportation Panel on Certification Standards for New Launch Vehicles, April 24, 1996, p. (1). For text see: [http://www.spacefuture.com/archive/comments\\_on\\_certification\\_standards\\_for\\_new\\_reusable\\_launch\\_vehicles.shtml](http://www.spacefuture.com/archive/comments_on_certification_standards_for_new_reusable_launch_vehicles.shtml). (accessed on 25.9.2002).

<sup>9</sup> P. Collins and K. Isozaki, "The Japanese Rocket Society's Space Tourism Research", International Symposium on Space Tourism, Bremen, 1997, March 20-22. For text see: [http://www.spacefuture.com/archive/the\\_japanese\\_rocket\\_society's\\_space\\_tourism\\_research.shtml](http://www.spacefuture.com/archive/the_japanese_rocket_society's_space_tourism_research.shtml). (accessed on: 25.9.2002).

<sup>10</sup> C. Lauer, "Analysis of Alternative Governance Models for Space Business Parks", Engineering Construction & Operations in Space 5, ASCE, Vol. 1, 1996, pp 177-185; and B. Sherwood *et al*, "Government Actions to Enable Space Business Parks", Engineering Construction & Operations in Space 5, ASCE, Vol. 1, 1996, pp 186-193.

<sup>11</sup> Patricia G. Smith, "Concept of Operations in the National Airspace System in 2005", Version 1.0, FAA Commercial Space Transportation, 1999, un-paginated. For the text see: [http://www.spacefuture.com/archive/concept\\_ofoperations\\_in\\_the\\_national\\_airspace\\_system\\_in2005.shtml](http://www.spacefuture.com/archive/concept_ofoperations_in_the_national_airspace_system_in2005.shtml). (accessed on: 25.9.2002)

and (c) Systems engineering and training. Active 'Strategies' have been worked out by FAA-AST to accomplish certain well-defined objectives in these three divisions.<sup>12</sup> This plan also outlines strategic support areas, vehicle system approvals and training, which cut across and support FAA-AST strategic focus areas.<sup>13</sup>

An evaluation of the existing Federal Aviation Regulations (FAR's) was conducted to assess their applicability to the design of reusable space vehicles. It was recognized that the existing FAR's do not cover all areas of reusable space vehicle (RSV) design, production, test and evaluation, and operations, but it suggested that the certification requirements for new RSV's can be developed within the existing FAR's, and that the FAR's and policies for RSV should therefore be similar to that of commercial aircraft. Apart from addressing the requirements for passenger space vehicles for having a type design certificate, production certificate, airworthiness certificate, commercial operators license, spaceport license and other approvals, it was emphasized that "Although individual nations need to put their own policies into place, their implementations need to be carried out in an atmosphere of international cooperation. This international planning should begin

<sup>12</sup> See 'AST Strategic Plan 2002', FAA-AST. For text see: <http://ast.faa.gov/files/pdf/strategicplan2k2.pdf>

<sup>13</sup> See [http://ast.faa.gov/aboutast/strat\\_plan.htm](http://ast.faa.gov/aboutast/strat_plan.htm)

now during the most formative stages of the Spaceways."<sup>14</sup>

Though there has been a conscious attempt to apply the regulatory system, which is generally followed in case of aviation, however it would have some inherent problems also. The principal of them is the domain of certification. There may be different types of certifications, including the spaceworthiness certificate. "In order to extend existing aviation regulations to apply to passenger space vehicles, appropriate rules concerning vehicle structural integrity and damage tolerance, fire-suppression systems, passenger evacuation standards, maintenance procedures and other matters must be developed."<sup>15</sup> A major practical problem for such type of certification is that these certifications are issued after lots of test runs and if such test runs are applied as a prerequisite mechanism the cost of operation per space flight will be enormous and that can pose a deterrent to the promotion of this industry.

Another important issue is the use of cryogenic propellants. Unlike aviation, the propellants used by space vehicles

<sup>14</sup> William Gaubatz, "Reusable Space Transportation - The Key Infrastructure Element in Opening the Space Frontier to the Public", Proceedings of 21st International Symposium of Space Technology and Science, May 24-31, 1998, Sonic City, Omiya, Japan. For the text see: [http://www.spacefuture.com/archive/reusable\\_space\\_transportation\\_the\\_key\\_infrastructure\\_element.shtml](http://www.spacefuture.com/archive/reusable_space_transportation_the_key_infrastructure_element.shtml)

<sup>15</sup> P. Collins and K. Isozaki, "Legal and Regulatory Issues for Passenger Space Travel", *supra* note 6.

is different in composition and use. It has a close nexus with the safety of the flight also. In case of emergency landing of an aircraft, its fuel is generally jettisoned but in case of a space flight it has to be maintained in flight for a longer time in order to burn out the propellants on board the spacecraft.

Though a preliminary study in Japan showed that the noise level in case of space transport vehicles is far more than the permissible noise level, it is expected that with the passage of time and with the advent of advance technology this can be taken care of. The supporters who encourage space tourism vehemently forward their views that space tourism flights are so rarely flown that they would not affect anybody except the travelers who would be mentally prepared to bear such noise. This problem can also be tackled by constructing spaceport far away from human localities.

The most serious issue that has troubled various study groups is that of space traffic management. Once space vehicles start flying regularly and aircraft traffic would increase with arithmetic progression by then, undoubtedly there could be severe interference between the two services. There would be a need of establishing a body parallel to the International Civil Aviation Organization (ICAO) for space activities.<sup>16</sup> If a similar organization for space traffic is created, possible conflict of their jurisdictions

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<sup>16</sup> For more discussion on ICAO's role, see below.

and overlap of operations of space vehicles and civil aviation activities of the two organizations in view of the lack of demarcation between airspace and outer space, need to be resolved.

Unlike airplanes within the atmosphere, spacecrafts in orbit do not maintain fixed positions relative to the Earth's surface, and so a practical procedure for defining orbits needs to be devised and agreed upon.<sup>17</sup> There is an ongoing discussion regarding 'slot management'. To date, allocation of 'slots' has been carried out primarily for the geostationary orbit. Although that orbit is easy to define, the matter of allocating geostationary orbital 'slots' is nevertheless the subject of substantial legal activity involving both telecommunications law and space law.<sup>18</sup> This activity will have some serious implications in defining and

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<sup>17</sup> P. Collins and T. Williams, "Towards Traffic Control Systems for Near-Earth Space", Proceedings of 29th Colloquium on the Law of Outer Space, IISL, 1986, pp. 161-170; also [www.spacefuture.com/archive/towards\\_traffic\\_control\\_systems\\_for\\_near\\_earth\\_space.shtml](http://www.spacefuture.com/archive/towards_traffic_control_systems_for_near_earth_space.shtml); and P. Collins, "Legal Considerations for Traffic Systems in Near-Earth Space", Proceedings of 31st Colloquium on the Law of Outer Space, IISL, 1989, pp. 296-303; [www.spacefuture.com/archive/legal\\_considerations\\_for\\_traffic\\_systems\\_in\\_near\\_earth\\_space.shtml](http://www.spacefuture.com/archive/legal_considerations_for_traffic_systems_in_near_earth_space.shtml).

<sup>18</sup> J. Thompson, "Space for Rent: The International Telecommunications Union, Space Law, and Orbit/Spectrum Leasing", *Journal of Air Law and Commerce*, Vol. 62, 1997, pp. 279-311.

regulating the use of space "traffic lanes" and low Earth orbits.<sup>19</sup>

Security issues will be a major concern from the beginning of the space travel. Any deficiency in security may bring devastation for future prospects of this industry. Therefore, insurance issues will also have important relevance to space travel as they are currently for the aviation industry. Substantial insurance coverage will be needed to make each venture risk-free and a successful one both from the operator's point of view and that of the travelers.

For the sub-orbital flights the question of training may not be so important but for orbital flights it will play a significant role as some formal training to appraise and regulate the behavior of the space tourists in zero/micro gravity environment will be required. Medical certification may also be necessary which may limit the intake of space travelers for orbital flights. The passengers will not only be exposed to physical stress due to a micro/zero gravity environment but also to the high speed with which the orbital flights would operate and the level of endurance a human body could bear. There is also the risk of damaging space radiation, which needs to be taken care of.

For the sub-orbital flights mainly, and in a few cases of orbital flights also, the question of international political relations between States would inevitably come into play requiring

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<sup>19</sup> L. David, "Surge in Launchers Spurs FAA to Study Traffic Control Plan", *Space News*, Vol. 9, No 15, 1998, pp. 4 and 19.

compliance of relevant immigration and customs laws.

Another important issue is that of liability. Some authors<sup>20</sup> feel that some regulatory mechanism may be developed similar to the one under the 1929 Warsaw Convention<sup>21</sup> that deals with the limits of liability not only because of the historic role it played in nourishing an infant aviation industry to its present adulthood but also in considering the interests of aviation passengers. However, the attitude and actions of the insurance industry in the wake of September 11, 2001 tragedy should act as a pre-cautionary lesson for not placing utmost reliance on the war risk insurance type clauses which may be applied to space transportation as well. Thus, not only an international treaty is required establishing a Warsaw Convention type regime but equal emphasis should be placed on the other insurance elements which are closely connected to any particular space flight operation. Another serious issue related with orbital space travel operations is the problem of space debris. Though a rosy picture is painted by all the commercial firms in order to promote their prospective space tourism endeavors, the most serious risk about which they are silent is the hazards

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<sup>20</sup> Ricky J. Lee et al, "Space Tourism and Permanent Human Settlement: The Legal and Regulatory Issues", *The legal and Regulatory Issues*", *Colloquium on the Law of Outer Space*, (2000), IISL-00-IISL.2.05, at p. 4; P. Collins and K. Yonemoto, "Legal and Regulatory Issues for Passenger Space Travel", *supra* note 6.

<sup>21</sup> Convention for the Unification of Certain Rules Relating to International Carriage by Air, Warsaw, October 12, 1929.

arising out of possible collisions with rapidly increasing space debris, particularly in the low Earth orbit. The insurance premiums inevitably would be high in view of this risk. Unless some parity is drawn between the operational cost (including insurance payable by the space liners) and the cost of travel per passenger, the space tourism industry may suffer irreparably despite the efforts by governmental or non-governmental entities.

It is interesting to note that during the last few years, several space-related tax reform bills have been introduced in the U.S. Congress. This shows that the U.S. government is taking important initiatives in space utilization, and if passed, these bills can be expected to encourage space tourism industry as well. Among the bills, are (a) Invest in Space Now Act of 2001(HR 2177),<sup>22</sup> (b) The Spaceport Equality Act (H.R. 1931, S. 1243),<sup>23</sup> (c) The "Zero Gravity, Zero Tax Act" (H.R. 2504),<sup>24</sup> (d) Space

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<sup>22</sup> To benefit investors of both small start-up launch companies as well as larger well-established ones, the proposed legislation offers two categories of tax credits: one for small space vehicle manufacturers and the other for large ones. See: <http://www.spaceprojects.com/tax/#INVEST>. <http://thomas.loc.gov/cgi-bin/query/D?c107:1:/temp/~c107TjLtax>.

<sup>23</sup> To treat spaceports like airports under the exempt facility bond rules. See: <http://www.spaceprojects.com/tax/#INVEST>. For the text see: <http://thomas.loc.gov/cgi-bin/query/D?c107:2:/temp/~c107TjLtax>.

<sup>24</sup> To amend the Internal Revenue Code of 1986 to provide tax incentives for investing in companies involved in space-related activities See: <http://www.spaceprojects.com/tax/#INVEST>. For the text see: <http://thomas.loc.gov/cgi-bin/query>

Tourism Promotion Act of 2001 (H.R. 2443),<sup>25</sup> and (e) Commercial Space Partnership Act of 1999 (S. 2316).<sup>26</sup>

### Legal status of space tourists

The universally accepted designation of a crewmember of a space object is "astronaut". However, there is no definition of the term "astronaut" in the 1967 Outer Space Treaty;<sup>27</sup> the first cardinal treaty which is accepted universally as the *magna carta* of the international space law. Though, the Russians use the term 'cosmonaut' for the same, the term 'astronaut' undoubtedly can be considered to have been legally and universally a recognized term as the Outer Space Treaty (adhered to by Russia as well) refers to this term.

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<sup>25</sup> To create guaranteed loans and capital gains exclusions essentially for the development of facilities and services directly involved with space tourism. See: <http://www.spaceprojects.com/tax/#INVEST>. For the text see: <http://thomas.loc.gov/cgi-bin/query>

<sup>26</sup> To authorize the lease of real and personal property under the jurisdiction of the National Aeronautics and Space Administration to public or private businesses, as well as to local, state and other federal government entities. See: <http://www.spaceprojects.com/tax/#INVEST>. For the text see: <http://thomas.loc.gov/cgi-bin/query/D?c106:1:/temp/~c106GymWKn>.

<sup>27</sup> The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies (adopted by the General Assembly in its resolution 2222 (XXI)), opened for signature on 27 January 1967, entered into force on 10 October 1967. (96 ratifications and 27 signatures). (hereafter referred to as the Outer Space Treaty).

Under the Outer Space Treaty, each astronaut is regarded as an 'envoy of mankind' in outer space.<sup>28</sup> Astronauts enjoy the assurance of universal assistance from States in the event of accident, distress or emergency landing be it on a territory of a State or high seas.<sup>29</sup> They enjoy the protection of and assistance for being promptly and safely returned to the State of registry of the space vehicle.<sup>30</sup>

In the texts of the international space treaties, (namely the Outer Space Treaty, the Rescue and Return Agreement, and the Registration Convention<sup>31</sup>) there has been the use of three terms for a space traveler, however without any definition of either of them; i.e. 'envoy of mankind', 'astronaut' and 'personnel'. An interesting matter is the status of an astronaut of a particular State *vis a vis* another astronaut of a different State.

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<sup>28</sup> Ibid., Article V.

<sup>29</sup> Ibid. Also see: The Agreement on the Rescue of Astronauts, the Return of Astronauts and the Return of Objects Launched into Outer Space (the "Rescue Agreement", adopted by the General Assembly in its resolution 2345 (XXII), opened for signature on 22 April 1968, entered into force on 3 December 1968. (87 ratifications and 26 signatures). (hereafter referred to as the Rescue and Return Agreement).

<sup>30</sup> Ibid.

<sup>31</sup> The Convention on Registration of Objects Launched into Outer Space, adopted by the General Assembly in its resolution 3235 (XXIX), opened for signature on 14 January 1975, entered into force on 15 September 1976. 43 ratifications and 4 signatures. (hereafter referred to as the Registration Convention).

These envoys of mankind transform into political identities representing two sovereign States; their interrelations, behavior, actions and movements are controlled and dictated by their respective States. So we can see that the status of a space traveler changes with location or situation; an 'astronaut' bearing a explorative and scientific connotation, a 'personnel' bearing administrative connotation, a 'representative of a State' bearing a political connotation, an 'envoy of mankind' bearing a global diplomatic yet humane connotation.

The legal status of a space tourist will have to fit in any of the above-mentioned three terms in conformity with the contemporary space law. However, their legal status seems to be more akin to an astronaut than the others. They have some traits of astronauts, though not all, and as such they can be called as pseudo astronauts. Whatever may be the case any space traveler, under the present regime of space law will remain under the jurisdiction and control of the State under which the concerned space object (the space tour vehicle) is launched.<sup>32</sup> The 'take-off' of a spacecraft will be treated as a launch. Again each space travel venture will be treated as separate launch and a separate space activity and the appropriate State will be internationally responsible for it.<sup>33</sup>

Dennis Tito, the first officially acclaimed space tourist had the status of a space tourist for the public and the

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<sup>32</sup> Article VIII of the Outer Space Treaty.

<sup>33</sup> Article VII of the Outer Space Treaty.



media, a guest cosmonaut for the Russians and an amateur astronaut for the Americans.<sup>34</sup>

It is quite interesting to note that the second commercial space traveler, Mark Shuttleworth, has not been termed as a 'guest'. He has been designated as a 'non-professional cosmonaut.'<sup>35</sup> His mission was not to just travel for pleasure but something more than that which has changed his status from a mere guest to a pseudo cosmonaut intending to carry out a series of experiments on board the International Space Station. According to his spokesman, Barak Geffen, Shuttleworth was "a fully certified member of the Soyuz crew responsible for some of its systems during the flight [and would] conduct several scientific experiments with South African and Russian researchers..."<sup>36</sup> Unlike Tito, Shuttleworth had to undergo rigorous cosmonaut medical check ups, followed by a thorough cosmonaut training, including intense Russian language tuition. He was, in his own words, "Trying to achieve with this program what most countries set out to achieve when they first start a manned space program."<sup>37</sup> Thus Shuttleworth's motivation was not primarily pleasure (which remained the sole driving force

of a tourist) but to achieve scientific zero/micro gravity results. The Russians have asserted that they were selling the third seat on Soyuz space shuttle. As per the spokesman of Russian Space Agency, Sergei Gorbunov, "Taking into account our difficult situation, our partners will understand why we shall be forced to sell one of the three seats on Soyuz spaceships.[However], this is not to say that the third seat will invariably be sold to space tourists."<sup>38</sup> Thus, it appears that the Russian view on the status of a space tourist is of a 'non-professional cosmonaut'. This is supported by an official statement according to which Shuttleworth was "accompanied by professional cosmonauts."<sup>39</sup> It has already been decided that Lance Bass will be the third tourist.<sup>40</sup> However, according to a Russian official, Bass will receive "training as a simple space tourist like dozens of other amateurs that pay the Gagarin center for a theoretical course and a few thrills, such as low-gravity parabolic plane flights ... [and] will not train as part of the two-person professional crew".<sup>41</sup> Thus for the Russians, Shuttleworth was a 'non-

<sup>34</sup> <http://www.spacedaily.com/news/011206133411.3i4zwwq28.html> (accessed on: 27-12-01)

<sup>35</sup> <http://www.spacedaily.com/news/020122143959.qz3jsqlw.html>, (accessed on: 22-01-02)

<sup>36</sup> <http://www.spacedaily.com/news/011204120530.hlj8wds3.html> (accessed on: 27-12-01)

<sup>37</sup> <http://www.spacedaily.com/news/tourism-02a.html> (accessed on: 06-0102)

<sup>38</sup> <http://www.spacedaily.com/news/020122143959.qz3jsqlw.html> (accessed on 22-0102)

<sup>39</sup> <http://www.spacedaily.com/news/011205155750.qi4myfex.html> (accessed 27-12-01)

<sup>40</sup> Simon Saradzhyan, "Lance Bass to Resume Cosmonaut Training, Won't Fly Until April at Earliest", 20 September 2002; on line: [http://www.space.com/missionlaunches/bass\\_resumes\\_020920.html](http://www.space.com/missionlaunches/bass_resumes_020920.html) (accessed on: 27.9.02).

<sup>41</sup> Ibid.

professional cosmonaut' and Bass will be a 'simple space tourist'.

These first space travelers are expected to lead to a host of similar tours from different nations. The borderline between a space tour and a space travel is fading and so is the status of a space tourist, a space traveler and an astronaut.

In determining the legal status of a space traveler an essential question is: 'for what mission?' There may be a secondary query 'under which flag?' The Russian approach of commercializing space made it more important for the West to carve out the importance of the flag bearer of the space traveler. However the importance of a flag warrants great importance considering the specific provisions of the Outer Space Treaty, the Registration Convention, the Rescue and Return Agreement, and the Liability Convention,<sup>42</sup> particularly from the perspective of liability as well as jurisdiction and control.

### **Licensing:**

An important part in space tourism operations is the regulatory regime, at both the international and national levels. This is due to the fact that a space tour vehicle, in its flight to and from outer space, will travel through and/or by using the airspace of several States. Under the 1944 Chicago

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<sup>42</sup> The Convention on International Liability for Damage Caused by Space Objects, adopted by the General Assembly in its resolution 2777 (XXVI), opened for signature on 29 March 1972, entered into force on 1 September 1972. 81 ratifications and 26 signatures. (hereafter referred to as the Liability Convention).

Convention, each State enjoys "complete and exclusive sovereignty over the airspace above its territory."<sup>43</sup> On the other hand, the 1967 Outer Space Treaty, in its Article 1(2) recognizes the freedom of outer space. Since there is no clear demarcation between airspace and outer space, national legal regimes may dictate the rules and limitation of flights through their respective airspace. There is also no clear acceptance of a right of 'innocent passage' allowing a particular space flight through the sovereign airspace of foreign States.<sup>44</sup> Therefore, a space tour vehicle for its operation would need licenses from the States whose airspace it could be traversing. As space tourism primarily will be a commercial activity, it is likely that some States may be reluctant to grant such licenses or may grant them with costly conditions. In order to minimize this regulatory burden, States should

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<sup>43</sup> The Convention on International Civil Aviation (signed at Chicago, on 7 December 1944), Article 1.

<sup>44</sup> The opinion of the Council of ICAO, as presented by the ICAO Observer to the Legal Subcommittee of the COPUOS at its 1986 session, is that: "(d) The right of innocent passage of spacecraft through the sovereign airspace is *proposal de lege ferenda* (i.e. a legislative proposal not reflecting the existing law); such right does not exist under the present international law of the air; an unconditional right of passage through the sovereign airspace does not exist even with respect to the civil aircraft and is specifically subject to a special authorization with respect to State aircraft and pilotless aircraft; (e) The operation of spacecraft in the airspace may require operational co-ordination with air navigation services to ensure the safety of air navigation." See document: C-WP/8158 of 15/1/86.

enter into space transport bilateral or multilateral agreements, as is the case in civil aviation.

The other important dimensions of licensing will emerge when space tourism becomes a significant economic activity. "Licensing covers a variety of non-direct investment production operations, involving arms-length cooperation with an external agency (or agencies). Some elements of market transfer are included in this packaged sale of asset services. A spectrum of relationships is possible, ranging from (the rare) simple sale of embodied knowledge or assets (brand name, patent) through franchising, turn key operations, contract manufacturing, management contracts etc."<sup>45</sup> Therefore, space tourism industry will involve a variety of legal licensing like any other regular commercial operation.

At the national level, the U.S. has been the most active country in devising licensing regime and procedures for privately operated reusable space transportation systems. As noted above, since 1995, the FAA-AST has been actively developing licensing procedure for commercially operated reusable space vehicles.<sup>46</sup> The FAA-AST draws its limited authority and/or responsibility to regulate the commercial space transportation industry, from the law regulating

Commercial Space Launch Act.<sup>47</sup> At present the FAA-AST grants a license when it determines that an applicant's launch or reentry proposal or proposal to operate a launch site will not jeopardize public health and safety, safety of property, the U.S. national security or foreign policy interests, or international obligations of the United States. The FAA-AST, however, does not license launches performed by and for the U.S. government agencies.<sup>48</sup> The FAA-AST has been considering applying appropriate aviation procedures to the field of private reusable space transport vehicles. Though, the existing FARs do not cover all areas of RSVs design, production,

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<sup>47</sup> 49 USC, Subtitle IX, Chapter: 701, gave the FAA-AST the responsibility to: "regulate the commercial space transportation industry, only to the extent necessary to ensure compliance with international obligations of the United States and to protect the public health and safety, safety of property, and national security and foreign policy interest of the United States, ... encourage, facilitate, and promote commercial space launches by the private sector, recommend appropriate changes in Federal statutes, treaties, regulations, policies, plans, and procedures, and facilitate the strengthening and expansion of the United States space transportation infrastructure." <http://ast.faa.gov/lrra/>. For the text see: <http://ast.faa.gov/aboutast/701complete.html> (accessed on: 29.9.2002). It should be noted that the 'finding and purpose' of this Act was *inter alia* to encourage the United States private sector to provide launch vehicles, reentry vehicles, and associated services by simplifying and expediting the issuance and transfer of commercial licenses and facilitating and encouraging the use of Government-developed space technology.

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<sup>45</sup> Stephen F. Witt, Michael Z. Brooke, Peter J. Buckley, *The Management of International Tourism*, 2nd Edition (New York: Routledge, 1992) at p.65.

<sup>46</sup> P. Collins and K. Yonemoto, "Legal and Regulatory Issues for Passenger Space Travel", *supra* note 6.

<sup>48</sup> <http://ast.faa.gov/lrra/>. Also see: <http://ast.faa.gov/files/pdf/2000rlv.pdf> (both accessed on: 29.9.2002).

test and evaluation and operation, it has been suggested that the certification requirements for new RSVs can be developed within the existing FARs and that the FARs and the policies for RSVs should therefore be similar to that of commercial aircraft.<sup>49</sup> There has been recommendation that the FAA-AST should be given further authority and resources to extend its work to include passenger space travel and to license private aircraft to provide zero-gravity flight services to the general public.<sup>50</sup> In fact, in July 2001, a bill has been introduced in the U.S. Congress. If enacted, it will authorize the Secretary of Transportation to issue regulations governing activities related to space tourism.<sup>51</sup>

#### **ICAO and space tourism:**

The involvement of the International Civil Aviation Organization in space tourism should also be seriously considered. The space traffic will have to be appropriately and smoothly accommodated with air traffic, which in itself has become so congested. It will take a serious consideration by all States through ICAO, as the forum, to work out a viable solution to this

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<sup>49</sup> P. Collins, "Legal Considerations for Traffic Systems in Near-Earth Space", Proceedings 31st Colloquium on the Law of Outer Space, IISL, 1989, pp. 296-303.

<sup>50</sup> Robert L. Haltermann, Report On The First U.S. Space Tourism Conference, "Going Public": Moving Toward The Development Of A Large Space Tourism Business, September 30, 1999. For the text see: <http://www.space-transportation.org/99ConReport.htm> (accessed on: 29.9.2002)

<sup>51</sup> Space Tourism Act 2001, July 2001, (H.R. 2443).

problem. Space and air traffic management issues will be a major factor in the allotment of air 'slots' to both air and space liners. Air and space traffic congestion will also force the States to reorganize their military or defense air routes and will likely result in more stringent rules. ICAO's role will be very important in the near future as a participant in resolving the space traffic issues. It is an interesting question as to whether the States will also empower ICAO with a mandate to deal with space travel safety and security issues, as it does in the civil aviation sector.

Will there be parallel aviation and space treaties or will the present aviation treaties be amended to incorporate, with harmony and without dichotomy, the space travel issues and aspects? Will ICAO be the international organization to formulate a regulatory framework for passenger space travel needs or is there a necessity of establishing a parallel or identical international body for space travel related activities and issues? The U.S. FAA-AST has already "proposed the formation of an International Space Flight Organization (ISFO) to play the role of the International Civil Aviation Organization (ICAO) in relation to space travel."<sup>52</sup> Collins and Funatsu rightly assert "the ISFO would help to coordinate different countries' activities and ensure that agreement is reached on

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<sup>52</sup> P. Collins, "Space Activities, Space Tourism and Economic Growth", Proceedings of 2nd International Symposium on Space Tourism, Bremen, April 21-23, 1999. For the text see: [www.spacefuture.com/archive/space\\_activities\\_space\\_tourism\\_and\\_economic\\_growth.shtml](http://www.spacefuture.com/archive/space_activities_space_tourism_and_economic_growth.shtml). (accessed on: 28.9.2002).

international procedures and standards in a timely manner”.<sup>53</sup>

An interesting proposal from Smith<sup>54</sup> for establishing “Space Transition Corridors” (STC),<sup>55</sup> and supported by Collins and Funatsu,<sup>56</sup> warrants a serious consideration. According to these scholars the STC will enable efficient and economical use of airspace and outer (orbital) space.

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<sup>53</sup> P. Collins and Y. Funatsu, “Collaboration with Aviation - The Key to Commercialization of Space Activities”, IAF Congress paper no IAA-99-IAA.1.3.03, 1999. For the text see: [http://www.spacefuture.com/archive/collaboration\\_with\\_aviation\\_the\\_key\\_to\\_commercialisation\\_of\\_space\\_activities.shtml](http://www.spacefuture.com/archive/collaboration_with_aviation_the_key_to_commercialisation_of_space_activities.shtml). (accessed on: 28.9.2002).

<sup>54</sup> Patricia G. Smith, Concept of Operations in the National Airspace System in 2005, Federal Aviation Administration Office of Commercial Space Transportation, February 8, 1999. For the text see: [http://www.spacefuture.com/archive/concept\\_of\\_operations\\_in\\_the\\_national\\_airspace\\_system\\_in\\_2005.shtml](http://www.spacefuture.com/archive/concept_of_operations_in_the_national_airspace_system_in_2005.shtml). (accessed on: 28.9.2002).

<sup>55</sup> Zones linking an area on the ground to an area in orbit reserved for either a vehicle returning from orbit or a launching vehicle, into which aircraft are not permitted for the duration. it is not a permanent fixed route like an air-lane, but a temporary zone defined in space and time within a computerized air traffic control system.

<sup>56</sup> P. Collins and Y. Funatsu, “Collaboration with Aviation - The Key to Commercialization of Space Activities”, IAF Congress paper no IAA-99-IAA.1.3.03, 1999. For the text see: [http://www.spacefuture.com/archive/collaboration\\_with\\_aviation\\_the\\_key\\_to\\_commercialisation\\_of\\_space\\_activities.html](http://www.spacefuture.com/archive/collaboration_with_aviation_the_key_to_commercialisation_of_space_activities.html). (accessed on: 28.9.2002).

### **Registration of transportation vehicles:**

In terms of the existing space legal regime, all launches of space objects to or beyond Earth orbit are to be registered nationally and with the United Nations. According to Funatsu “in case of commercial spaceships which are repeatedly launched (or which can be described more appropriately by saying “flown”) and space structures which are not launched but built and operated in orbit, this requirement (*of being registered with UN*) seems impractical and should not be applicable to these vehicles”<sup>57</sup> (emphasis supplied). He suggests that “the nature of registration for commercial space vehicles should be the same as that for aircraft, the purpose being the establishment of their ownership and identification. It is administered nationally according to ICAO procedures.”<sup>58</sup>

The Outer Space Treaty affirms that States shall bear international responsibility for their national activities in outer space.<sup>59</sup> The Treaty also entrusts ‘jurisdiction and control’ of a spacecraft to the State on whose registry an object launched into outer space is carried.<sup>60</sup> Thus the Registration

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<sup>57</sup> Y. Funatsu, “Some Aspects of Space Navigation Law”, Proceedings of 2nd International Symposium on Space Travel, Bremen, April 21-23 1999 for text see: [http://www.spacefuture.com/archive/some\\_aspects\\_of\\_space\\_navigation\\_law.shtml](http://www.spacefuture.com/archive/some_aspects_of_space_navigation_law.shtml) (accessed on: 28.9.2002)

<sup>58</sup> Ibid.

<sup>59</sup> Outer Space Treaty, Article VI.

Convention, which draws its formulation or legislative basis from the Outer Space Treaty, not only aims to provide identification of space objects but also aims to fix the responsibility arising out of any space activities pertaining to that space object on a launching State. While providing for a detailed procedure regarding registration, the Registration Convention incorporates the same definition of launching State as in the Outer Space Treaty and the Liability Convention.

The Registration Convention provides two fold benefits; i.e. (i) in case of any damage caused to the spacecraft during its flight, (e.g. due to space debris), the responsibility could be attached to the State of registry or for that matter the launching State(s) by identifying the space object (debris) responsible for the damage; and (ii) for fixing responsibility in case of any damage from which a third State suffers.

Whether the 'flag of convenience' practice, as followed in the maritime field, can be applied to space tour vehicles is a time-tested question. Keeping in view the Outer Space Treaty and the Registration Convention, it is clear that even if the flag of convenience is used by a space travel company the victim State will have legal recourse for remedy against the State (of the tour operator), which comes within the definition of a launching State or the State of registry.

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<sup>60</sup> Outer Space Treaty, Article VIII.

### **Liability for damage:**

Liability issues may be broadly categorized under two types: criminal liability and civil liability. The former deals with the more human element in space operations and thus essentially involves punitive consequences whereas the latter includes the legal framework of national and international rules and regulations and compensation issues arising out of space operations.

### **Criminal liability:**

In the case of space tourism, criminal liability may arise on two occasions. First in case of the passengers who are going for pre-orbital and orbital flights and secondly the passengers who will be availing/utilizing or staying on a space station or platform. The legal regime of outer space comprising the five international space treaties<sup>61</sup> do not provide for it specifically.

In the first case, guidance may be sought from the existing aviation conventions on this subject which may be said to be the first uniform, universal and collective approach, initiative and action of all nations to effectively tackle the problem of aviation security. There has been a major contribution to the development of international law in the

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<sup>61</sup> They are: the 1967 Outer Space Treaty, the 1968 Rescue and Return Agreement, the 1972 Liability Convention, the 1995 Registration Convention, and the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, adopted by the General Assembly in its resolution 34/68, opened for signature on 18 December 1979, entered into force on 11 July 1984. (9 ratifications and 5 signatures)

field of civil aviation security by different aviation security instruments with the initiative of ICAO.<sup>62</sup> These international legal instruments while creating special criminal jurisdiction of, and international duty upon, the State of registry in respect of or arising out of offences and other acts which can endanger civil aviation, brought the system of universal jurisdiction in international law and granted particular rights, functions and entitlements to the Pilots-in-command which they did not possess earlier under international law. This issue however unfolds another very important aspect relating to the scope of authority and power to be vested to the Commander of a space tourist vehicle. It is advisable to adopt the same scheme both in cases of the application of criminal jurisdiction, liabilities and vesting of authority to the Commander, as they basically deal with issues similar to the safety and security

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<sup>62</sup> To summarize them: The first international instrument was the 'Convention on offences and certain other acts committed on board aircraft' signed at Tokyo (commonly known as Tokyo Convention, 1963), followed by the 'Convention for the suppression of unlawful seizure of aircraft' signed in Hague (commonly known as Hague Convention, 1970), 'Convention for the suppression of unlawful acts against the safety of civil aviation' signed in Montreal (commonly known as Montreal Convention, 1971), 'Protocol for the suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, Supplementary to the Convention for the suppression of unlawful acts against the safety of civil aviation done at Montreal' signed in Montreal (commonly known as Montreal Protocol, 1988) and 'Convention on the marking of Plastic Explosives for the purpose of Detection' done in Montreal (commonly known as Montreal Convention, 1991).

arising out of aviation passengers' misconduct or criminal behavior.

An answer to the second part of the issue, which deals with criminal liability and/or jurisdiction on space stations or platforms may be searched for in a multilateral space station agreement between five Partner States, commonly known as the Inter Governmental Agreement of 1998.<sup>63</sup>

The 1998 IGA is the first exhaustive legal document dealing with different aspects of space activities. Generally criminal matters are dealt with under the respective national criminal legislations and jurisdictions. However, matters relating to criminal liability and/or jurisdiction over crimes occurring on the space station have been given somewhat uniform treatment under Article 22 of 1998 IGA. It not only provides that Partner States "may exercise criminal jurisdiction over personnel in or on any flight module element who are their respective nationals"<sup>64</sup> but also allows other Partners to prosecute the perpetrator, in certain cases. This means that no perpetrator could escape prosecution taking advantage of his/her national criminal legislation or absence of a extradition treaty. Once this framework is fully implemented,

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<sup>63</sup> Agreement among the Government of Canada, Governments of Member States of the European Space Agency, the Government of Japan, the Government of the Russian Federation, and the Government of the United States of America concerning cooperation on the Civil International Space Station, 20 January 1998. (hereafter referred to as the 1998 IGA)

<sup>64</sup> Article 22(1) of the 1998 IGA.

criminal jurisdiction and liability issues in the operation of space tourism could be easily and properly addressed.

The Parties (Partner States) to this Agreement have taken steps towards reforming their national legislations in order to fulfill their respective obligations (particularly those that relate to criminal matters) under the 1998 IGA. The glaring example on this point is that of Canada as it has enacted the *Civil International Space Station Agreement Implementation Act*<sup>65</sup>. By virtue of Section 11 of this Act, Section 7 of the Canadian Criminal Code<sup>66</sup> has been amended in order to incorporate corresponding changes in the liability arising out of criminal behavior of the crewmember(s) on aboard the ISS.

It would be advisable to follow the guideline as set out in the 1998 IGA while attempting to draft and formulate regulations and internationally enforceable rules governing criminal liability issues in space tourism sector.

#### Civil liability:

The Outer Space Treaty and the Liability Convention bring under their umbrella the entire gamut of issues arising out of launching (including the attempted launching) of space objects (which include component parts of space objects or launch vehicles) and assign liability to the launching State(s)

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<sup>65</sup> Statutes of Canada 1999, Chapter 35, as passed by, The House of Commons, 19<sup>th</sup> November 1999, 2nd Session, 36th Parliament, 48 Elizabeth II, 1999. Bill C-4, assented to on 16th December 1999.

<sup>66</sup> Revised Statutes of Canada, Chapter C-46.

for damage<sup>67</sup> caused to a third party. They cover liability issues for both pre-orbital and orbital accident/damage.

The Liability Convention assigns absolute liability for damage caused on the surface of the Earth and to any aircraft in flight (i.e. the pre-orbital damage) and fault liability for damage caused elsewhere (meaning orbital damage). However it is controversial whether this Convention covers damage caused in orbit by space debris. Liability in such case may not be clearly and strictly assigned to the launching State(s) because of the difficulty in the identification of the origin of the damaging space debris. Some authors believe that the Convention "appears to be primarily concerned with a possible collision between [active] space objects."<sup>68</sup> However, an attempt may be made to take advantage of the Registration Convention to assign liability to the State of registry (which will also be the launching State) if the space debris causing such damage could be identified on the basis of registration under the Convention.

The important liability questions, directly relevant to space tourism, which need to be addressed are: (a) whether a flight undertaken by a space passenger vehicle can be termed as

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<sup>67</sup> 'Damage' is defined in Article I, to mean loss of life, personal injury or other impairment of health, loss of or damage to property of States or of persons (natural or juridical) or property of international intergovernmental organization.

<sup>68</sup> Glen H. Reynolds and Robert P Merges, *Outer space: problems of law and policy*, (Boulder, Colo.: Westview Press, 1997), p. 212.



launching, (b) whether space transport vehicles are space objects, and (c) what will be the treatment and status of the passengers or space tourists under the Liability Convention?:

(a) The term ‘launch’ has not been defined in any of the five international space treaties.<sup>69</sup> If the ‘taking off’ of a space transport vehicle with space tourists is deemed to be a launch, it would have two opposite repercussions. This can also be termed as the dichotomy arising out of the legal interpretation of the term ‘launch’. On the one hand, if it is a space launch, then the definition of launching State<sup>70</sup> squarely applies and the space tourists are covered under the Liability Convention. On the other hand, this interpretation could debar the same tourists from claiming for any damages under Article VII of the Liability Convention.<sup>71</sup>

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<sup>69</sup> *Supra* note 61.

<sup>70</sup> According to Article I (c) of the Liability Convention, the term “launching State” means: (i) a state which launches or procures the launching of a space object; (ii) a State from whose territory or facility a space object is launched. Similar definition is included in Article VII of the Outer Space Treaty and in Article I (a) of the Registration Convention.

<sup>71</sup> Article VII of the Liability Convention provides that: “The provisions of this Convention shall not apply to damage caused by a space object of a launching State to: (a) nationals of that launching State; (b) foreign nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its descent, or during such time as they are in the immediate vicinity of a planned launching or recovery area as the result of an invitation by that launching State.”

(b) The term ‘space object’ has not been clearly defined in any of the five international space treaties. But the use of the word ‘an object’ in Article VII of Outer Space Treaty, especially in the context of launching, can be deemed to apply to a space transport vehicle. Thus, this interpretation will give rise to a problem and will have bearing on a particular group of space tourists, leading to the following third question.

(c) If space tourists (passengers) from a launching State (having the nationality of that State) are not covered under the Liability Convention; that is to say, if any damage is caused to them from the space transport vehicle (treating the space transport vehicle as a space object) they will be disqualified from making any claim under Article VII of the Liability Convention. This is inconsistent with the entire fabric of liability regime that the space tourism industry has to rely on and will be a serious deterrent to the industry itself.

Article VII of the Liability Convention poses another impediment to space tourism and could have far reaching consequences. It stipulates that the Liability Convention is not applicable to “foreign nationals during such time as they are participating in the operation of that space object from the time of its launching or at any stage thereafter until its descent.” If flying of a space transport vehicle to the outer space is deemed to be a ‘launch’ and if the space vehicle is a space object, then the foreign nationals who are space tourists (passengers) are not sheltered by the international protections granted by the Liability Convention. Thus any space tourist having a foreign nationality will

be debarred from making any claim against damage occurring during the space travel. This would not help the space tourism industry to flourish.

So it is in this context that the definitions included in the international space treaties are to be revisited in order to give space tourists the maximum benefit and sense of security against any apprehended damage, which may be incidental to the space operation/travel. It has rightly been observed that "Risks will in any case have to be objectively small or passenger space travel will not be acceptable" to the general public.<sup>72</sup>

The situation can also be perceived from a different perspective. The location of passengers may be either on the ground (in vicinity of the spacecraft during embarkation or disembarkation) or in outer space during the flight depending on its course. If they are on the ground, they may have recourse to remedies for damage caused to them, under the domestic (national) statutes or tort law rules. This is also in consonance with customary international law that requires the exhaustion of local remedies. For the passengers in flight or "in the space vehicle, the question of law may be based on the issue of jurisdiction. As the State of registry under the Registration Convention applies its jurisdiction to the spacecraft, any claims for damages incurred by the [passengers] would be pursued within the State of jurisdiction. The liability

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<sup>72</sup> P. Collins and K. Yonemoto, "Legal and Regulatory Issues for Passenger Space Travel", *supra* note 6.

for injury or death of employees would be covered by domestic occupation health and safety laws."<sup>73</sup>

Thus it is advisable to set up a liability system, which would resemble the Warsaw Convention. This should not only provide protection to the passengers but also encourage operators, as well as the space tourism industry during its infancy phase.

There has been a conscious attempt on the part of different States to bring about national regulatory frameworks for implementing their international obligations relating to liability arising out of space activities. Some of the most important examples of such regimes are:

a) The Australian Space Activities Act, 1998, was adopted with an objective *inter alia* to provide for the payment of adequate compensation for damage caused to persons and property as a result of space activities regulated by the Act.<sup>74</sup>

b) The Japanese Law Partially Amending the NASDA Law, 1998, obligates NASDA to enter into third party liability insurance contracts and binds NASDA to enter into special arrangements by which NASDA shall assume all liability for damage caused

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<sup>73</sup> Ricky J. Lee and Yuri Takaya, "Space Tourism and Permanent Human Settlement: The Legal and Regulatory Issues", *supra* note 20.

<sup>74</sup> Act. No. 123, 1998, assented to on December 21, 1998, Section 3(b).

to anyone related to the launch in certain cases.<sup>75</sup>

c) The Russian Law on Space Activity, 1993, *inter alia* provides that Russian Federation shall guarantee full compensation for direct damage inflicted as a result of accidents while carrying out space activities in accordance with the legislation of Russian Federation.<sup>76</sup>

d) The South African Space Affairs Act, 1993, conditionally provides immunity against issues of liability for the Minister, his Council, the State and its employees against anything done under the Act.<sup>77</sup>

e) The Swedish Act on Space Activities, 1982 provides that if, on account of its obligations under international agreements, the State has been held liable for damage caused as a result of space activities carried on by person (who had undertaken the space activity), such person shall reimburse the State accordingly, unless special reason warrants against it.<sup>78</sup>

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<sup>75</sup> Promulgated as the law (law no. 87) on June 3, 1998 and became effective as of same day. For a detailed analysis of this law, see Masahiko Sato, "The Japanese Legal Framework: Third Party Liability Resulting From NASDA Launch", IISL-98-IISL-2.05, p. 32.

<sup>76</sup> August 20, 1993, Section VII, Article 30 "liability for damage".

<sup>77</sup> Statutes of Republic of South Africa no. 84 of 1993. Assented to 23 June, 1993, date of Commencement: September 6, 1993; Section 21.

<sup>78</sup> Section 6 of the Act (1982:963).

f) The United Kingdom Outer Space Act, 1986, while providing an immunity to person acting as an employee of another and to anything done on the instruction of the Secretary of State, secures payment of compensation as mandatory indemnification to her Majesty's government by any person to whom the Act applies while engaging in space activity, including space launches.<sup>79</sup>

g) The U.S. Commercial Space Launch Act provides that a launch license will be granted once the applicant satisfies the FAA-AST that he has procured an appropriate insurance policy.<sup>80</sup> The policy should cover (a) upto \$100 million against loss to the US government, and (b) upto \$500 million against third party claims for death, bodily injury, or property damage or loss resulting from an activity carried out under the license. However, in case the damages exceed these amounts, the U.S. government covers them up to a ceiling of \$1.5 billion for a single event or incident. In addition, the risk is allocated through reciprocal waivers of liability (excluding willful misconduct) between the licensee, its customers and their respective contractors and subcontractors.

## FINAL REMARKS

It is well known that without full governmental participation and

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<sup>79</sup> Section 10 of the Act, 1986 Chapter 38.

<sup>80</sup> The Commercial Space Launch Act, 49 USC, Subtitle IX, Chapter 701, Sections 70112 and 70113.

financial support space activities would have remained a myth. However, it came to light through the studies made by different organizations that there is now a growing discontent and apathy of the taxpayers towards funding space travel and tourism, which is basically a commercial venture and will benefit only a handful of private companies and individuals. Thus governments are not fully and enthusiastically investing taxpayers' money in promoting space tourism. They are encouraging private participation not only to develop space transport vehicles but also to commercially exploit them, while keeping the overall control and supervision of the activities under an emerging regulatory framework. In the words of U.S. Congressman Robert Walker "Most of our laws and regulations governing space activity were written to make it easier for the government to function in space. Now we need to make it easier for the private sector to undertake space development."<sup>81</sup>

The unleashing of vast wealth and economic development through space tourism is no longer a hypothesis but a reality that could be achieved soon. The myths about space which reigned its existence in the minds of a common average man is fading away fast as space travel by 'ordinary' people would become possible in the near future.

In order to encourage the viability and commencement of space tourism industry, numerous legal and regulatory issues must be addressed and resolved

both at international and national levels in a timely fashion. Some of them are the formulation and enforcement of strict operational procedures, safety standards, security requirements and licensing rules by the respective governments. The resolution of these issues will ensure the safety of space travel and thus will provide impetus to space tourism for the general public.

The existing international space treaties need to be revised in order to resolve severe conflict with the current and future uses of outer space, particularly space tourism. It is submitted that they should be consolidated in a single comprehensive consistent and forward looking international treaty, perhaps similar to the 1944 Chicago Convention.

In view of the lack of demarcation between airspace and outer space possible conflict of jurisdictions and overlap of operations, of space vehicles and civil aviation activities need to be resolved either empowering ICAO or if a similar organization for space traffic is created, between the two organizations.

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<sup>81</sup> L. Roberts, "Space Business incentives, It's time to act", *Ad Astra*, Vol. 8, No. 2, pp. 38-39.