The Intersection of Insurance Markets and Liability Regimes Regarding Third-Parties and Space Flight Participants in Commercial Space Activities

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Abstract

The intersection of insurance markets and liability regimes regarding third-parties and space flight participants (SFPs) in commercial space activities is important because of the potential impact on the development of an industry that is important for national economic and national security reasons. Third-parties are those not involved with the space activity while SFPs are those aboard space craft that are not crew. Commercial human space flight is set to begin on a large scale in earnest soon and this will increase the number of launches taking place. The U.S. third-party liability regime is under pressure for change. If the U.S. Congress enacted third-party liability caps, or, alternatively, a long-term extension of the promise of government indemnification for large loss events, this would benefit industry and not impact insurance capacity or prices to any significant degree. However, if the U.S. government revisits its Maximum Probable Loss (MPL) calculation – MPL being the amount that space launch companies are required to obtain in third-party liability launch insurance -- and adjusts it upward, this could have a negative impact on industry. Insurance premium outlays would increase, particularly for sub-orbital companies anticipating significant frequency of launches and that pay higher premium rates due to their lower per launch MPLs, at least until vehicle track records are established and discounted bulk buying is possible. The United States is the only country to date addressing SFP liability issues, but most legislation is at the state-level. U.S. state laws, while seemingly intended to protect space operators from negligence suits, suffer from drafting ambiguities, potential gaps and loopholes, and, collectively, leave an inconsistent patchwork of rules. In spite of the uncertainty, at least one company has begun offering $5 million life and health policies for SFPs, although many of the SFPs in the early stages of the industry will be high-net-worth individuals that may choose to simply bear the risk of injury or death. A clear federal rule establishing immunity for space operators from negligence suits by SFPs will

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likely create a more efficient insurance market. A uniform rule placing the liability on industry for SFP death and injuries should be avoided given it would greatly increase the cost of tickets leaving the United States at risk of the nascent industry making future investments in more favorable regulatory jurisdictions.

I. Introduction

To state the obvious, space activities are subject to a certain measure of risk. As SpaceX-founder Elon Musk recently stated in a tweet, "Rockets are tricky." Rockets that launch satellites and space craft are filled with 20 times more propellant than the weight of the rocket itself and must travel 25 times faster than passenger aircraft to reach earth orbit. The space environment itself can be harsh with space weather conditions and even space debris becoming an issue of increasing concern. Accidents will likely harm space flight participants (SFPs), defined as those aboard space craft that are not crew, and could even damage third-parties not involved in any way with the space activity. Liability regimes are a way to assign risk to certain parties engaging in space activities. Insurance is a way of spreading and managing the (assigned) risk. However, liability regimes established for space activities are not necessarily entirely clear, and application of such rules to complex fact situations can lead to more uncertainty. Additionally, liability regimes are under pressure for change in the United States, the predominant user of space, and the initial launching point of large scale commercial human space flight in the very near future. The space insurance industry is highly evolved and mature with three to four major brokers and 30-35 underwriters for such policies. Yet, the insurance industry reaction to potential changes in the *third-party* liability regime and the uncertainty and potential changes to the *SFP* liability regime in the United States will be important for the commercial space industry and its customers to be able to spread and manage risk. The reason for focusing on the US liability regime is several-fold: international treaty rules do not impact the insurance market directly, the US third-party liability regime is under pressure for change more so than other countries, the United States is to date the only country to address SFP liability directly, albeit much of it at the state rather than federal level, and large scale commercial human space flight will begin from the United States in the near future.

II. Space Insurance & Other Diversification Alternatives

Space insurance covers not only payloads (or satellites), including pre-launch, launch, and on-orbit risks, but also covers the risk that third-parties may be harmed or have their property damaged. The liability for third-party injury or damage caused by space launch activities is assigned by statute or regulation as most countries with significant space activities wish to protect third-parties from harm, and, thus, unsurprisingly assign most of this risk to the space launch operator and even require the operator to garner insurance for a large piece of

the risk.[1] In the United States, space launch operators are required to acquire third-party liability insurance for launch activities, including damages caused up to 30 days after launch. A robust, mature insurance market has developed in which launch operators can purchase third-party liability insurance for space launch activities with their customers and contractors listed as additional insureds.[2] The United States does not require launch operators to obtain in-orbit third-party liability coverage, although the United Kingdom has such a requirement (even though it is not always followed).

However, because rockets launching objects to space carry large amounts of fuel and are traveling at tremendous speeds, there is always the very minimalistic chance of a massive, catastrophic incident harming third-parties. In order to stimulate space launch activities and protect companies from "crushing liability"[3] in such instances, and to protect the national security and national economic benefits of such activities, governments often (wisely) choose to either promise government indemnification if liability exceeds a certain very large amount or seek to limit or cap the liability of commercial space launch companies to a particular amount. Policy-makers must decide at what point to step in with government indemnification or cap the third-party liability of launch operators and their customers and contractors. Existing policy decisions are under re-examination within the United States with pressures for change. Given insurance requirements and companies desire to spread and manage risk, insurance market reaction and adaptability to the uncertainty and possible changes is thus of interest to both policy-makers and space business decision-makers.

Government policy-makers, business executives, and the insurance industry are also seeking to tackle the newest type of risk with space activities. Commercial human space flight is set to begin in earnest on a large scale in the next couple of years with sub-orbital flights and, accordingly, the number of private parties travelling to space is set to increase significantly in the next decade. To date, only seven private individuals have traveled to space for orbital journeys to the ISS aboard the Russian Soyuz for tickets costing between $20-40 million. At

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1 *See, e.g.,* Frans von der Dunk, *Towards 'Flags of Convenience' in Space?*, 55th IISL Colloquium on the Laws of Outer Space (2012); Matthew Schaefer, *The Need for Federal Preemption and International Negotiations Regarding Liability Caps and Waivers of Liability in the Commercial Space Industry*, forthcoming in 33 Berkeley Journal of International Law (January 2015), currently *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2420538.

2 Thus, third-party damages caused by a space object deorbiting after years in space and striking a person or building on Earth or caused by space materials (rocks, dust) brought back to Earth are not covered by the required insurance and not discussed in this paper.

3 This term was first introduced by Professor Shavell. *See* Steven Shavell, *An Analysis of Causation and the Scope of Liability in the Law of Torts*, 9 J. Legal Stud. 463, 465 (1980). It has been used in a variety of contexts, but the central point is one wants to avoid using liability regimes in a manner that reduces or drives out socially useful activities.

least one such tourist was required by the Russian government to purchase accidental death insurance up to $5 million.[4] Only one government to date – the United States – has specifically addressed commercial human space flight in its national space legislation but interestingly has left liability issues concerning SFPs to state governments who compete for space business in part based on the favorability of their liability legislation towards space businesses. The insurance capacity and lines applying to SFPs needs examination as does the insurance industries reactions and adaptations both to new levels of commercial activity and new legislative enactments.

In the space sector, it is likely that companies are primarily seeking diversification of liability exposure and not as motivated by the claims handling and defense services of commercial liability insurers. In the third-party context and in particular in the SFP injury situation, at least in the early stages of commercial human space flight, rejection of coverage arguments must be balanced against business goodwill to a much greater degree that perhaps more established and less publicized industry pursuits.

Diversification alternatives to liability insurance in the space industry are either unappealing for policy reasons or seemingly impracticable at the current stage of the industry. Diversification through the stock market or bond market has occurred in the large defense contractor, so-called "old space" companies but is not present in much of the "new space" companies. Options of staying thinly-capitalized and simply resorting to bankruptcy in case of a massive accident do not appeal to many of the new space entrepreneurs given their broader social goals for space activities. That route is also unappealing for policy reasons – it could lead to the loss of the minimum redundancy and competition that now exists in the space sector and thus harm national security and the national economy.

III. Legal Uncertainty in Liability Regimes & Other Uncertainties That May Inhibit Creation of Insurance Markets

Before delving into the US liability regime – to reemphasize, one that is under pressure to change with respect to third-parties and one that features a patchwork of inconsistent state laws regarding SFPs - it is worth asking if an insurance market requires certainty in a liability regime to operate. Traditionally, there have been four reasons put forth that may act as inhibitors to the formation of an insurance market for a particular risk: 1) legal uncertainty; 2) underwriting uncertainty; 3) regulatory uncertainty; and 4) market uncertainty.[5] For example, each of these four uncertainties is alleged to

4 *See* Pamela Meredith and Marshall Lammers, *Commercial Spaceflight: The Ticket to Ride*, ABA Air & Space Journal (2013) at 6.

5 *See* R.J. Lehmann, *Why Major Insurers Won't Cover Uber, Lyft Drivers*, San Francisco Examiner, Oct 16, 2014, available at

be currently impacting potential insurance for commercial ride-sharing services such as Uber and Lyft.[6] Legal uncertainty refers to whether or not a court would find an individual or company liable for a particular activity. In the space arena, legal uncertainty impacts the potential SFP insurance market given the patchwork of inconsistent state laws that govern the topic but does not impact much the space launch third-party liability market because any uncertainty is limited to only massive, catastrophic accidents involving enormous third-party damages. Underwriting uncertainty refers to whether underwriters have substantial and credible data to assess risk. Some of the spacecraft to be used in commercial human space flight and other new space activities are new designs and thus may leave underwriters with less than ideal information. Regulatory uncertainty refers to whether a policy is allowed to be issued for a particular risk. This appears not to be a problem in the space sector. Market uncertainty pertains to whether a potential market is large enough to be profitable for insurers underwriting policies for an activity. This is not a problem for third-party liability connected with space launch activities, as such a market is well established, but may be a problem for the creation of SFP insurance policies in the near-term.

Assuming that underwriting uncertainty can be overcome through higher initial premiums on new spacecraft and further reduced because of the technical expertise employed by space insurers, the creation of SFP insurance policies is likely to be mostly impacted by legal uncertainty and market uncertainty. Interesting there is some trade-off between these two uncertainties when discussing SFP policies. If a liability regime clearly assigns risk, then the party to whom the risk is assigned can make an informed decision on whether to purchase insurance for the risk or whether to self-insure. If there is sufficient demand for insurance, a market is likely to develop, as premiums from a large number of parties will allow the insurance industry to spread the risk over that large number of parties while covering losses upon occurrence of the risk and retain a profit. However, even if a risk is not clearly assigned, a market can develop, as both sides of the transaction, fearing they may be the one that ultimately bears liability in case of accident, may seek out insurance. Indeed, insurers in the abstract may prefer this state of affairs – as premiums could hypothetically double. However, it may also be the case in such situations, that parties involved wrongly assume the other bears the risk of accident, and neither seeks out insurance and no market develops. Additionally, insurers may have more trouble pricing an insurance product in such an instance as the risk of payout and subrogation possibilities are less clear too. Thus, while an SFP insurance market can establish itself without legal uncertainty being reduced, it will function most efficiently by reducing transaction costs and potential over-

http://www.sfexaminer.com/sanfrancisco/why-major-insurers-wont-cover-uber-lyft-drivers/Content?oid=2909369

6 *See id.*

insurance when a liability regime clearly assigns the risk of a particular incident or accident to a particular party (either the SFP or the space launch company). Of course, liability is often not akin to a on-off switch so it is a bit of an oversimplification to say risk for SFP injury or death will be assigned to either the SFP or the space launch operator. However, while admitting the oversimplification, in the context of SFP liability it is important to realize the main issue raised by space activity is the difficulty of distinguishing inherent risk from negligence. If the space launch operator is protected from negligence suits, then it will likely be the case that the SFP will bear the risk of injury or death since gross negligence and intentional misconduct are very difficult to prove and the defense costs of the space launch operator will be substantially reduced in any suit in all likelihood.

IV. International Treaty Rules on Third-Party Liability and SFP Liability

International treaty rules do not directly impact the insurance market as those rules address one nation's liability to another nation's government for damage caused by its national space activities, whether governmental or non-governmental. Governments, at least large ones, typically do not purchase insurance for third-party liability, preferring to simply bear the risk of any loss. Admittedly, the international treaty rules influence national regimes, and thus indirectly influence the insurance market. The Outer Space Treaty states that "Each State Party to the Treaty that launches or procures the launching of an object into outer space, including the Moon and other celestial bodies, and each State Party from whose territory or facility an object is launched, is internationally liable for damage to another State Party to the Treaty or to its natural or juridical persons by such object or its component parts on the Earth, in air space or in outer space, including the Moon and other celestial bodies." [7] In doing so it does not lay out a standard of fault for liability. However, the Liability Convention does so by stating that a country is absolutely liable for damage caused by its space object on the Earth or in airspace, and that for damage cause in space it is a fault-based standard.[8] Some smaller nations have drafted their third-party liability legislation to specifically speak in terms of a reimbursement obligation imposed upon space-launch-licensed entities towards the government should their government have liability under the Liability Convention.[9] The U.S. third-party liability legislation is not drafted in such a manner – it applies to situations in which the United States may have international liability under the Liability Convention but also where the United States would not, i.e. where there are no international implications, such as

7 *See* Outer Space Treaty, Art. VII.
8 *See* Liability Convention, Arts. II &III.
9 *See* von der Dunk, *supra* note 1.

where all parties involved are United States citizens and the only territory involved is the United States.[10]

Interestingly, the Liability Convention would not cover SFP liability for at least two-reasons. First, the Liability Convention only covers third-party liability situations.[11] For example, Art III speaks of a situation in which one space object damages another and thus would not cover a situation in which a foreign SFP was injured in a single spacecraft accident involving another nation's spacecraft.[12] Second, the Liability Convention specifically excludes from coverage, damage caused by a space object 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, 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."[13] While one might argue SFPs do not participate in the "operation" of the space craft, treaty provisions must be interpreted in their context and in light of their object and purpose, and that context, including Art. III, and the object and purpose indicate strongly that those persons directly and voluntarily involved in space activities were meant to be excluded from coverage.[14] For all of these reasons, the international treaty provisions concerning liability do not impact the supply or demand of insurance in any direct way. Instead, it is national legislation that does so.

V. U.S. Regime Regarding Third-Party Liability

The United States third-party liability regime is a three tiered system.[15] In the first tier, operators are responsible for third-party damages up to the Maximum Probable Loss (MPL), that is calculated by the FAA using a long-standing formula.[16] In essence, the MPL calculation is to cover all losses but the one-in-ten-million chance massive, catastrophic accident.[17] The MPL calculation varies by launch vehicle and launch site. The average MPL since 1988 is around $99 million, although recent SpaceX launches have MPL's in neighborhood of $36 million and sub-orbital test flights have MPLs as low as

10 *See* Schaefer, *supra* note 1.

11 *See* Frans von der Dunk, *Passing the Buck to Rogers: International Liability Issues in Private Spaceflight*, 86 Nebraska L. Rev. 400, 412 (2007)("The Liability Convention, though not referring anywhere explicitly to the concept, only deals with third-party liability."); Stephen Hobe, *Legal Aspects of Space Tourism*, 86 Neb. L. Rev. 439, 450 (2007); Steven Freeland, *Fly Me to the Moon: How Will International Law Deal with Commercial Space Tourism*, 11 Melbourne J. Int'l L. 90, 104 (2010).

12 *See* Schaefer, *supra* note 1.

13 *See* Liability Convention, Art. VII(2).

14 *See* Schaefer, *supra* note 1.

15 *See* 51 USCA Sec. 50914-15.

16 *See* 51 USCA Sec. 50914

17 *See* Schaefer, *supra* note 1.

approximately $4 million.[18] The FAA requires launch licensees to obtain third-party liability insurance for the MPL amount covering launch plus 30 days and the launch operator's contractors, subcontractors, customers, and their customers' contractors and subcontractors – are mandatory additional insureds.[19] The second-tier involves the highly unlikely situation in which the damages to third-parties exceed the MPL. In this tier, the US government has in essence promised to indemnify the operator for the next $2.8 billion in damages.[20] However, in such a situation, it would take an appropriation law passed by Congress to actually live up to the promise. [21] The third-tier involves the even more unlikely situation that third-party damages exceed the MPL plus $2.8 billion. In the third-tier the liability reverts to the launch operator.[22]

This US system has been in place since the 1988. However, the system is under some pressure for change. Proposed changes include creating a liability cap for the launch operator at the level of the MPL.[23] A cap would guard against the unlikely, although not impossible, scenario in which Congress does not live up to the promise of government indemnification due to other budget priorities, other national emergencies, and/or a post-accident rationalization that the US no longer needs the current minimal amount redundancy in space launch capacity and is willing to have a space operator go bankrupt. A cap would also give US operators a level playing field with their major launch competitors in France, Russia and China that benefit from de facto or de jure third-party liability caps.[24] Others want the MPL to be adjusted to account for changes in the value of the loss of life. This is being pushed in spite of the fact third-party damages have never exceeded the MPL and in fact no third party claims have been made as a result of over 200 U.S. FAA-licensed commercial launches since the first one in the late 1980's.[25] This should probably come as no surprise given the choice of a one-in-ten-million probability chosen for an MPL-exceeding event. Finally, industry, at a minimum, is seeking the promise of government indemnification to be a long-term promise rather than the recent one-year to three-year extensions that have occurred.[26] In fact, the recent three-year extension passed in 2014 after a second short-term lapse of the promise of government indemnification over the past several years.[27]

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18 *See* GAO Report 12-899, Commercial Space Launches: FAA Should Update How it Assesses Federal Risk Liability (July 2012)[Hereinafter "GAO Report."].; *See also* Schaefer, *supra* note 1.

19 *See* 51 USCA 50914 (b); *See also* 14 C.F.R. 440.17 & 440, Appendix B, para. 7(b).

20 *See* 51 USCA 50915(a).

21 *See* Schaefer, *supra* note 1.

22 *See id.*

23 *See id.*

24 *See id.*

25 *See id.*; *See also* GAO Report, *supra* note 18.

26 *See* Schaefer, *supra* note 1.

27 *See id.*

VI. Third-party Liability Insurance and Possible Impacts of Changes in U.S. Third-party Liability Regime

What would happen in the insurance market if any of these changes happened in the US system? A liability cap set at the MPL would likely have no impact on insurance offerings or prices. The insurers as it stands are only on the hook for amounts up to the MPL. MPL amounts are far below the capacity for third-party liability coverage in the marketplace. Although one cannot be certain, the third-party liability insurance capacity per launch will likely not be impacted much even in an environment in which space launches increase substantially, particularly because the largest increase in launches are likely to be sub-orbital ones in the near-term and those launches have low MPLs putting less stress on the system. Third-party liability for space launches comes out of a very large pot of money used for third-party liability for aviation generally and the space traunch or portion of that pot of money is a small percentage of the whole. Price for third-party liability is currently around one-tenth of a percent (0.1%) for policies around $100 million, as is the average for orbital launches. However, premium rates raise to one-half of a percent (0.5%) or more for policies with coverages of around $10 million, a more likely MPL, although probably still high, for a sub-orbital launch. Rates increase the smaller the third-party liability coverage based on the assumption by underwriters that the smaller amount is more likely to be accessed by the insured than larger amounts. It is unlikely that premium rates would be impacted by a cap as again the insurers are only on the hook for the MPL not amounts above or below that. Of course, if increased launches lead to an accident involving third-party liability this could drive up insurance premium rates in the short term, and even potentially affect capacity.[28]

A long-term extension of the promise of government indemnification does not provide as much certainty as a permanent liability cap for industry investment, but the short-term nature of current promises of government indemnification does not impact insurance prices because insurers are only on the hook for the first-tier MPL amount not anything in the second or third-tiers of liability anyway. Uncertainty in the government indemnification promise in the second-tier can affect launch operators contractual negotiations, but does not impact insurance prices.

If the MPL is adjusted upwards, say by increasing the value of life used in the calculation but without adjusting the one-in-ten-million probability choice for the MPL calculation, then companies will pay more in total insurance premiums. Indeed, with an increasing number of launches, total outlays for premiums by space launch licensees will substantially increase unless they can bulk buy policies for multiple launches. Thus, for sub-orbital launch companies, that seek frequency of launches far beyond that of orbital launch

[28] *See* GAO Report, *supra* note 18, at 15-16.

companies, an increased MPL could be of considerable concern, particularly before launch vehicle performance record is established and bulk buys of policies might be available to significantly reduce insurance premium prices. To the extent establishment of a liability cap might increase the already present political pressure, unjustifiable as it may be, to adjust MPL calculations upward, sub-orbital companies in particular may be somewhat torn on the establishment of a liability cap. Sub-orbital companies pay a higher premium rate due to the lower MPLs involved in their launches than orbital launch companies. A cap would clearly be a benefit in providing certainty and eliminate the need to rely on Congress passing an appropriation law in event of an MPL-exceeding accident, but could be a detriment in leading to increased MPL amounts and corresponding increased insurance premium expenses.

VII. U.S. Regime Regarding Space Flight Participant (SFP) Liability

Liability of commercial operators to space flight participants (SFPs) and their heirs has only been addressed in one nation's laws to date, that of the United States. In the 2004 Commercial Space Launch Amendments Act (CSLAA), the U.S. Congress declined to require SFPs to sign cross-waivers of liability with commercial launch operators, the operators' contractors and sub-contractors, and the operators' customers, despite such a provision being in the original House of Representatives version of the bill.[29] Those cross-waivers bar suit against one another except in cases of "willful misconduct," thus preventing suits based on negligence and, most likely, gross negligence as well. Instead, the federal law requires written informed consent be obtained from SFPs after the space launch licensee informs the SFP of various risks.[30] The informed consent regime does not act as a waiver.[31] However, six space active states -- California, Florida, New Mexico, Texas, Virginia, and Colorado -- passed legislation seeking to immunize to some degree commercial space operators from suits by SFPs or their heirs. Arizona became the seventh state just in the past few months but they passed the legislation primarily for high altitude balloon launches that will be licensed by the FAA so Arizona's law will not be analyzed here.[32] Other states are considering such legislation, including Georgia. While the intent of the legislation was to protect space launch operators from negligence suits, it is unclear if the statutes will be interpreted in that fashion. Additionally, the state laws have some drafting ambiguities, potential gaps and loopholes, and,

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29 *See* Tim Hughes & Esta Rosenberg, Space Travel Law (and Politics): The Evolution of the Commercial Space Launch Amendments Act of 2004, 31 J. Space L. 1, 4-5 (2005).

30 See 14 CFR 460.45.

31 *See* Laura Montgomery, *Space Tourism and Informed Consent: To Knowingly Go,* 51 Fed. Law. 26, 27 (July 2004)

32 *See* Jeff Faust, *Arizona Passes Spaceflight Liability Bill*, Space Politics, April 24, 2014, available at http://www.spacepolitics.com/2014/04/24/arizona-passes-spaceflight-liability-bill/

collectively, create an inconsistent patchwork of liability rules.[33] Indeed, the laws in one or more these six states have the following problems:

1) Fail to provide immunity to manufactures and suppliers of the launch operator (California and originally New Mexico as well)[34];
2) Reintroduce the possibility of negligence suits by including "knew or should have know"-type language in the exceptions to immunity (California, Florida, New Mexico, Colorado)[35];
3) Limit liability only for inherent risks or "exclusively" inherent risks, potentially creating room for arguments that negligence claims are not precluded[36];
4) Fail to account for the interaction with the state's common law on contractual waivers of liability, e.g. in some states, if a statute is present it sets a ceiling on liability limitations potentially negating additional protections sought under the common law governing contractual waivers (New Mexico)[37]; and
5) Fail to account in their drafting for very narrow constructions of immunity statutes previously passed for other industries, such as the equine industry.[38]

Additionally, it might even be argued that the state liability immunity statutes are preempted by the federal CSLAA. The CSLAA prohibits state laws that are inconsistent with it but not those that are additional to, or more stringent than, federal regulations under the CSLAA.[39] Congressional intent is the cornerstone of all preemption analysis.[40] If one argues that by dropping the original House bills requirement that SFPs enter into cross-waivers with launch operators that Congress intended to allow SFP negligence suits, then one could argue the state liability immunity laws are inconsistent with the Congressional intent in the CSLAA. This argument may not prevail, with

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33 *See* Schaefer, *supra* note 1; See also Frans von der Dunk, *Federal versus State: Private Commercial Spaceflight Operator Immunity Legislation in the United States,* 56th IISL Colloquia on the Laws Governing Outer Space (2013); Pamela Meredith and Marshall Lammers, *supra* note 11, at 6-7. ("The statutory protections are limited and sometimes ambiguous."); Rachel Yates, *State Law Limitations on the Liability of Spaceflight Operators*, The SciTech Lawyer 14, 16 (Summer 2012)

34 *See* Schaefer, *supra* note 1.

35 *See id*; *See also* Yates, *supra* note 33.

36 *See* Schaefer, *supra* note 1.

37 *See* Maria-Vittori "Giugi" Carminati, *Is Statutory Immunity for Spaceflight Operators Good Enough?*, American University Legislation and Policy Brief, Vol. 6, Issue 1, *available at* http://digitalcommons.wcl.american.edu/lpb/vol6/iss1/

38 *See id.*

39 *See* 51 USC Sec. 50919(c).

40 *See, e.g.,* English v. General Elec. Co., 496 U.S. 72 (1990)("Preemption fundamentally is a question of Congressional intent.").

others arguing silence cannot preempt, but it does add further uncertainty to the liability rules regarding SFPs.[41]

Further, despite launch companies undoubtedly using choice of law and choice of forum clauses, it is possible that foreign SFPs might successfully attempt foreign litigation.[42]

The federal government will likely be considering amendments to the CSLAA in 2015. The Congress should strongly consider requiring SFPs to join the federal cross-waiver regime or otherwise bar suits by SFPs and their heirs to create a clear liability situation within the United States.[43] (Indeed, two reasons to grant statutory immunity to space operators from such suits rather than placing SFPs in the federal cross-waiver regime is first, the administrative burden of signing waivers once sub-orbital launches are frequent[44] and, second, the fact that one may not wish to preclude suits by SFPs based on claims of gross negligence would most likely occur if including SFPs in the current cross-waiver regime[45]). The US could also pursue negotiations with foreign countries seeking foreign legislation barring such suits to foreclose the possibility of foreign litigation by SFPs. Doing so would make clear it is incumbent upon SFPs to decide whether to seek insurance coverage for risks involving inherent risks and negligence by the operator (which may be difficult to distinguish in the space environment in any event). It may be difficult to pass such an amendment and to successfully engage in such negotiations, but attempts should be made.

VIII. SFP Liability Insurance and Potential Impact of Current Uncertainty and Future Changes to SFP Liability Regime

How is the insurance industry reacting to this state of affairs as we approach the first large scale commercial human spaceflights? At least one company, Ironshore International's Pembroke Managing Agency Limited through its Lloyd's Syndicate 4000 (Pembroke), is offering insurance coverage for SFPs in sub-orbital space flights. Pembroke's product will cover "personal risk exposure of death, serious injury, and associated medical expenses" for sub-orbital SFPs.[46] Insurance coverage limits are available for up to $5 million for any one passenger and up to $20 million for any one space flight event.[47] Given the mere existence of the state laws purporting to grant some immunity to space launch operators and the waivers that will be signed by SFPs, it is likely that at least some SFPs

41 *See* Schaefer, *supra* note 1.
42 *See* Schaefer, *supra* note 1.
43 *See id.*
44 *See* Note, *Houston, We Have A Liability Problem*, 112 Mich.L.Rev. 833, 856 (2014).
45 *See* Schaefer, *supra* note 1.
46 *See* Ironshore's Pembroke Agency Launches Accident Coverage for Space Tourism, Insurance Journal, June 12, 2014, *available at* http://www.insurancejournal.com/news/international/2014/06/12/331637.htm
47 *See id.*

will seek out insurance. However, given the uncertainty surrounding the state laws, it is possible launch companies might also purchase such policies or even require SFPs to obtain such policies or prove. But at least three factors will likely damp down demand for such policies. First, the policies are likely to be quite expensive for early launches before a track record is established and this will be a disincentive to both SFPs and the sub-orbital launch companies purchasing such policies. The SFP insurance policy is similar to personal accident insurance for sky diving and other such activities, although probably even more costly. A sky-diving life insurance policy premium runs around 0.25 – 0.75% depending on number of dives per year.[48] There were 19 fatalities in 3.1 million jumps in 2012.[49] A sub-orbital SFP premium is likely to be priced at between two and five percent (2%-5%) of the covered amount, and thus a $5 million policy might run as much as $100,000 or more. In establishing rates, companies will of course take into account that seventeen persons have died attempting to reach space out of roughly 536 successes, although nearly all involved orbital launches.[50] Tickets aboard the space tourism company with the most deposits cost roughly $200,000 and thus an insurance policy might add 50% or more to total cost of the venture for an SFP desiring insurance. Second, many SFPs have high net worth and thus might also choose to simply bear the risk of loss or take their chances with litigation (and settlement negotiations) post-accident. Third, if only one or few companies offer such policies, competition will not be steep and rates may remain high.

It is true that uniform U.S. federal solution for SFP liability could also place the bulk of liability on the industry by allowing negligence suits by SFPs. However, it seems the level of price increase caused by in essence requiring industry to garner SFP insurance would harm an emergent industry that is important for the national economy and national security, keeping in mind sub-orbital flights also have significant research components and are not just for tourism purposes. Additionally, sub-orbital company vehicles may be adapted for small satellite launches, a capability of keen interest to the U.S. government. The current legal uncertainty regarding liability is not likely to lead to the most efficient market for insurance customers as transactions costs will be greatly increased. Given the high net worth of the persons aboard sub-orbital spacecraft in the first decade or so of such activity, the higher cost of insurance for vehicles without a proven track record, and the need to stimulate industry in the United States with possible foreign competition on the horizon, it seems prudent to have SFPs bear the risks of space travel themselves – the intent behind most existing state statutes – in an

48 *See* Trusted Choice, Life Insurance for Skydivers, available at https://www.trustedchoice.com/life-insurance/personalized-coverage/skydivers/

49 *See id.*

50 *See* Wikepedia, *List of Space Travelers by Name*, available at http://en.wikipedia.org/wiki/List_of_space_travelers_by_name

amended federal CSLAA.[51] This can be done by requiring SFPs to enter into mandatory cross-waivers of liability with space operators and other companies involved in the space launch or otherwise prohibiting negligence suits by SFPs and their heirs by granting statutory immunity from suit (with a preference for the latter for reasons discussed above[52]).

IX. Conclusions

Space insurance market capacity and prices and national liability regimes can have an impact on the development and competitiveness of space industry and investment decisions in the sector. Thus, the reaction of space insurance markets to changes and/or uncertainty in liability regimes in large launch countries such as the United States is important to study. The U.S. third-party liability regime is under pressure for change. First, there are calls to establish a permanent liability cap set at the Maximum Probable Loss (MPL) or, alternatively, at a minimum, to create a long-term extension of the promise of US government indemnification for losses exceeding the MPL. While either of these changes would be beneficial to US industry in their own right since major competitors benefit from de jure or de facto third-party liability caps, the changes will also do no harm to insurance capacity and prices for third-party liability. Space launch licensees must obtain insurance for third-party liability only up to the MPL amount and since the insurers are only on the hook for this level of third-party damage, they are not impacted by changes to the so-called second tier of liability above the MPL. Since third-party liability policies for space activities are handled out of the large pot of money collected for third-party liability policies for aviation generally, even a significant increase in launches per year is unlikely to impact capacity or price significantly because the space portion is so small compared to aviation generally. Second, there is also pressure in some quarters for an adjustment upward of MPL calculations by the FAA, for example, by increasing the value of life in such calculations. Such a change should be resisted given FAA already uses an incredibly conservative one-in-ten-million probability in such calculations –specifically, that the MPL will cover all but the one-in-ten-million probability, massive, catastrophic accident. An upward increase to MPL should also be rebuffed for its impact on insurance premium outlays by the industry. While increased MPL amounts would unlikely affect capacity or rates, it would lead to greater per launch and yearly premium outlays by industry in an environment of increasing numbers of launches and potentially place US space launch licensees at a competitive disadvantage with international competitors. For sub-orbital launch companies with relatively low MPLs and correspondingly higher premium rates and with plans for greater frequency of launches, such considerations may be of particular concern in the short-term, until vehicle

[51] *See* Schaefer, *supra* note 1.
[52] *See supra* notes 44 & 45 and accompanying text.

track records are established and the possibility of block-buys significantly reducing premium rates become more likely. With the US in the lead for the sub-orbital marketplace, this is an additional reason to resist upward adjustments to the MPL.

With regard to SFP liability, the U.S. federal CSLAA of 2004 did not require SFPs to enter into waivers with space launch operators and their contractors, sub-contractors and customers. However, in seeking to attract space launch companies, six states have passed legislation that on its face appears intended to afford liability immunity to operators from negligence claims made by SFPs. However, the state statutes contain drafting ambiguities, gaps in immunity, and potential loopholes, and collectively create an inconsistent patchwork of rules. Further, such state laws might even be argued to be preempted by the federal CSLAA if it was Congressional intent to allow such suits. The current ambiguities and inconsistencies creating legal uncertainty have not prevented at least one insurance company from offering $5 million life and health policies for SFPs. However, it will be interesting to see whether other insurance companies join the marketplace and how many SFPs will pursue such policies given the significant rates likely to be charge for such policies. Many SFPs in the first decade of sub-orbital human space flight will be high net worth individuals who may choose to simply bear the risk of loss or pursue litigation (and settlement negotiations) post-accident. However, insurance markets will be most efficient in terms of reducing transaction costs when liability rules are clear. This provides further support to recommendations to amend the federal CSLAA to require SFPs to enter into waivers or otherwise prohibit negligence suits by SFPs and their heirs. Of course, some argue a clear rule could also be made at the U.S. federal level placing liability for any SFP injuries on the space launch companies in cases of negligence, but this should be resisted as the United States has the early lead in this nascent industry that is important for national economic and security reasons, and distinguishing inherent risk from negligence in the space environment is extremely difficult. Placing responsibility on the industry at this stage could drive up effective ticket prices by 50% or more and leave ample room for other countries to attract the industry with liability rules providing protection for industry. This is particularly true as the value of life of high-net-worth individuals taking sub-orbital flights may very well go as high as $40 million, according to some authorities.