

LEGAL AND REGULATORY CHALLENGES TO LEVERAGING INSURANCE FOR COMMERCIAL SPACE

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ABSTRACT

There has been a great deal of discussion and literature regarding the issues of satellite cost, such as the impact export controls have on efficient international development and cooperation, and the need to find less costly launching solutions, such as reusable vehicles and cheaper fuel. What is not often discussed, however, is the third greatest expense for private entities: insurance, which the most important means for risk management (both for governments and the private sector). A launch insurance policy alone can cost anywhere from 7% to 20% of the insured value of a satellite. While large companies with significant financial backing can “self-insure” their satellites, this is not an option for smaller or emerging companies.

This paper explores the issues inherent in the offering, procurement, and handling of traditional areas of space insurance (pre-launch, launch, and on-orbit), including first, second, and third party liability, for the purpose of providing public policy and regulatory explanations and recommendations. The international space law regime is presented as a context for the overall analysis and discussion. This paper includes analysis of the impact of ITARs, State liability for private space actors, and liability waivers on the provisioning of insurance for space enterprises to aid companies in navigating the legal and regulatory environment. This discussion also includes the individual US State Spaceflight Liability and Immunity Acts that have been implemented by several of the major US commercial spaceport States.

INTRODUCTION

When a private entity seeks to place a satellite in orbit, the two greatest expenses in pursuing this goal are obvious and heavily considered: the cost of the satellite itself, and the cost of the launch. There has been a great deal of discussion and literature regarding the issues of satellite cost, such as the impact export controls have on efficient international development and cooperation, and the need to find less costly launching solutions, such as reusable vehicles and cheaper fuel. What is not often discussed, however, is the third greatest expense for private entities: insurance, which the most important means for risk management (both for governments and the private sector). A launch insurance policy alone can cost anywhere from 7% to 20% of the insured value of a satellite. While large companies with significant financial backing can “self-insure” their satellites, this is not an option for smaller or emerging companies.

The space insurance industry emerged as a separate field of insurance in 1965. Then, the first pre-launch and on-orbit insurance for a commercial satellite

was issued, while the first launch insurance was provided in 1968.¹ It is amazing to think that the a mere eight years after the first launch of any artificial satellite (Sputnik, launched by the government of the U.S.S.R.) that insurance was being provided for a satellite on a commercial basis. Since then, there has been significant growth and evolution of the industry. Communication satellite problems, spacecraft and launch failures, increasing space debris, and cyclical periods of high solar energy all contribute to space insurance being considered a “high risk” field of insurance. The increase in the number of private actors in the space industry as well as the rapid development of space laws are indicators of growth in the commercial space sector. As early as 2008, the insured value of the in-orbit insured satellite fleet alone was \$17.5 billion.² There has been an ongoing growth in entrepreneurial space activity. In 2009, the estimated total investment to the spaceflight industry was USD 1.46 billion. Of this investment, government contribution made up only 15%. In 2010, of the almost 1,000 operational satellites in orbit, only 175 commercial satellites were insured.³ “The most successful launch insurance policy ever negotiated at least for a satellite service provider, was 7% of the insured value for the satellite and launch vehicle. The typical cost of launch insurance today will likely range from 15% to 20% of the insured value.”⁴ This high cost of insurance and relatively low capacity of the market acts as a barrier to entry in the space industry for emerging companies. In an era when motivations for space activities are being re-evaluated, while private companies are encouraged by such programs as the X Prize to participate in space activities, it is critically important that the insurance industry be ready and able to provide the necessary coverage to support the space industry.

The United States Congress acted in 1988 to deal with the space insurance problem, by requiring cross-waivers of liability in space activities. “Prior to the passage of the 1988 Amendments, this country's private commercial space launch industry faced virtual shut-down because commercial launchers incurred huge liability risks and were unable to procure insurance at any price.”⁵ Though this approach was able to reverse the degradation of the space industry in the United States, it did not solve the problem of the limited availability and expense of insurance. While it rendered the participation in space activities possible without the burden of insurance, it is unquestionable that the availability of reasonably priced, comprehensive insurance would encourage further growth and development.

“Insurance for space activities has evolved over many years through the collaboration of aerospace clients, brokers, and the underwriting community

¹ Rod Margo, “Some Aspects of Insuring Satellites” (1979) 1979 Ins LJ 555 at 556.

² Chris Kundstadter, “What Keeps Space Insurers Up At Night...” (2008) XL Insurance.

³ OECD, “Insurance market for space activities”, (2011) *The Space Economy at a Glance*, OECD Publishing & OECD, “The Space Sector in 2011 and Beyond”, (2011) *The Space Economy at a Glance*, OECD Publishing.

⁴ Joseph N. Pelton, “Satellite Deployment, Station-Keeping and Related Insurance Coverage” (2012) Springer Briefs in Space Development 75.

⁵ *Martin Marietta Corp. v. INTELSAT* (1991) 763 F.Supp. 1327.

worldwide. The goal of that work was to provide flexible forms of insurance for a volatile class of exposure, which was not yet quantified by loss data.”⁶ In general, the space insurance market is a particularly unbalanced market, with a few accidents resulting in significant financial consequences.⁷ Given its importance to the success of the commercial space industry, it requires special attention.

TYPES OF INSURANCE

Types of Liability Insurance

Generally speaking, there are three main types of liability insurance – first, second, and third party. The party to contract for space insurance will be one bearing the risk of loss.⁸ “Similar to most commercial air transport insurance contracts, the space insurance policy is usually underwritten in syndicate where each individual underwriter assumes a percentage of the risk.”⁹ First party insurance covers losses sustained by the insured. In the case of space operators, claims are generally for total or partial loss of a spacecraft (including constructive total loss) or for delay in deployment. This insurance can cover, among other issues, physical damage, faulty design, ground operator mistake, inadequate testing, or performance reduction, depending on the policy wording.¹⁰ Generally a loss will be covered if the status of the satellite fulfills loss definitions in the insurance contract and satellite or a portion thereof cannot be used for its intended purpose.¹¹ The sums insured can range from as little as USD 10 million to as much as USD 450 million.¹²

Second party insurance has thus far been less relevant in the space arena, as it would cover passenger liability. As paid space flight participant voyages have not yet commenced, this is an emerging area of space insurance. It bears similarities to insurance for passenger liability in aviation, for example. Commercial operators can require spaceflight participants to maintain a certain level of insurance in order to participate,¹³ which would be a wise move going forward.

Third party insurance is the insurance that covers damage to third parties; those individuals and companies who are not in contract or relationship with the insured. No third party liability claims have been made in over two hundred

⁶ Piotr Manikowski, “The Columbia Space Shuttle Tragedy: Third-Party Liability Implication for the Insurance of Space Losses” (2005) 8:1 Risk Management and Insurance Review 141 at 142.

⁷ Gabriella Catalano Sgrosso, *International Space Law* (Florence: 2011, LoGisma) at at 479.

⁸ Philippe Montpert, “Space Insurance” in *Contracting for Space*, Lesley Jane Smith & Ingo Baumann, eds (Burlington: Ashgate, 2012) at 286.

⁹ Ruwantissa Abeyratne, “Synergies and Problems in Outer Space Insurance and Air Transport Insurance” (2002-2003) 30 *Transp LJ* 189 at 191.

¹⁰ Montpert, *supra* note 8 at 285.

¹¹ *Ibid* at 286.

¹² *Ibid* at 287.

¹³ Pamela Meredith and Marshall Lammers, “Commercial Spaceflight: The Ticket to Ride” (2013) *ABA Air and Space Journal* at 7.

commercial launches licensed in the U.S. since 1989.¹⁴ Aside from the Cosmos 954 negotiation between Russia and Canada, the only third party liability claim made worldwide was in the amount of one million USD for ground contamination in Kazakhstan as a result of a failed Proton launch in 2007.¹⁵ Thus, this is a low probability area of insurance with high potential losses.

Insurance Phases

Space insurance policies are often referred to as “all risk” policies, though critically, they are not “all loss” policies.¹⁶ There are three main “phases” of space insurance policies – pre-launch, launch, and in-orbit (or “life”) insurance. Pre-launch insurance is designed to cover risks from the beginning of the program (or the effective date of the policy). Risks that are covered include incidents during satellite construction or during the integration of its systems, transportation, storage, and placement on the launch vehicle and launch pad. It is possible to also insure a risk of launch delay as part of the pre-launch insurance policy.¹⁷ Generally, this phase of insurance ends when upon first ignition of the launch vehicle or at the point when the launch process becomes irreversible.¹⁸

The highest premium cost and most risky phase of insurance is the launch phase. This portion of the policy will be in effect from three to six months and includes placement of the satellite in its correct orbit and preparation of the satellite for its operational activities. The in-orbit phase commences at the end of the satellite operational capacity assessment. Generally, policies are negotiated on a year-to-year basis for the operational life of the satellite. There can be partial or total losses under in-orbit insurance, depending on whether or not the satellite can still perform a significant portion of its intended function. Partial losses can occur where some but not all transponders are functioning.¹⁹ The percentage of premium rate for each phase is determined by the probability of failure in that phase.²⁰

STATE LIABILITY

“[S]pace law, as it now exists, is not an independent legal system. It is merely a functional classification” of those rules of international and municipal law governing outer space.²¹ With regard to space risks, “underwriters are at least clear

¹⁴ Matthew Schaefer, “The Need for Federal Preemption and International Negotiations Regarding Liability Caps and Waivers of Liability in the US Commercial Space Industry” forthcoming in the *Berkeley Journal of International Law* at 7.

¹⁵ Montpert, *supra* note 8 at 284.

¹⁶ Stephen Tucker, “Some Strategic Defense Initiatives Toward Preventing U.S. Space Insurance Related Disputes and Litigation” (1993) 21 *J Space L* 123 at 126.

¹⁷ Sgrosso, *supra* note 7 at 491-492.

¹⁸ Montpert, *supra* note 8 at 283.

¹⁹ Sgrosso, *supra* note 7 at 492-493.

²⁰ Montpert, *supra* note 8 at 283.

²¹ Bin Cheng, *Studies in International Space Law* (Oxford: Clarendon Press, 1997) at 383.

that the assessment of exposure for operations in outer space should be done on the basis of the Liability Convention.”²² Therefore, it must be noted that in the regime established by the Outer Space Treaty and Liability Convention, Launching States²³ are responsible and liable for the space activities of their nationals.²⁴ “Responsibility is the necessary corollary of a right. All rights of an international character involve international responsibility. If the obligation in question is not met, responsibility entails the duty to make reparation.”²⁵

The Liability Convention is an elaboration of Article VII of the Outer Space Treaty,²⁶ which has, in conjunction with the State responsibility requirements of Article VI, become part of customary international law.²⁷ Article VII states:

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 or in outer space, including the moon and other celestial bodies.

Liability arises under the Article VI of the Outer Space Treaty in the sense that such liability is imposed as a secondary obligation flowing from the attribution of space activities to the State.²⁸ Importantly, Article VI states, in relevant part, that:

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

²² Margo, *supra* note 1 at 565.

²³ *Convention on International Liability for Damage Caused by Space Objects*, 29 March 1972, 961 UNTS 187 [*Liability Convention*], art I.

²⁴ *Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies*, 27 January 1967, 610 UNTS 205, arts VI & VII.

²⁵ Spanish Zone of Morocco Claims, Report 111 (1924) 2 UNRIAA 614 at 641.

²⁶ Ram S. Jakhu, *Legal Issues Relating to the Global Public Interest in Outer Space* (2006) J Space L 31 at 52 [Jakhu, “Global Public Interest”]; Cheng, *supra* note 21 at 636.

²⁷ Francis Lyall & Paul B. Larsen, *Space Law: A Treatise* (Burlington: Ashgate Publishing Company, 2009) at 71.

²⁸ Ricky J. Lee, “The Liability Convention and Private Space Launch Services” (2006) 31 Ann Air & Sp L 351 at 359.

This provision subjects States to responsibility for the activities of their nationals in outer space, including the authorization and supervision of such activities. With regard to the Liability Convention,

An assessment of the terms of Articles 3 and 7 of the 1967 treaty makes it clear that international law is generally relevant to the liability of states for launching space objects and for the space activities resulting from those launches. Because international law is applicable to such conduct, it is important to identify some international principles concerning space activity that do not derive from formal treaties²⁹

States are responsible for their internationally wrongful acts.³⁰ “Any violation by a State of any obligation, of whatever origin, gives rise to State responsibility.”³¹ In international law, the breach of treaty obligations is just such a violation. In accordance with the holding in the *Chorzów Factory* case, there are three elements of liability in international law: a legal obligation owed by a State, an act by the State which breaches that obligation, and an apparent link between the wrongful act and the damage caused.³² The “failure to subject non-governmental national space activities to authorization and continuing supervision would constitute an independent and separate cause of responsibility” under Article VI of the Outer Space Treaty.³³ The applicable standard in this situation would be a due diligence standard³⁴ Once that standard is met, “State responsibility occurs the moment the breach is committed, and not when the State is seen to have failed in its duty to prevent, suppress or repress such a breach.”³⁵

The *Corfu Channel* case also established the “knew or should have known” international legal standard for liability.³⁶ This is both the general fault standard in customary international law, and presumably the standard that would be applied for fault liability under Article III of the Liability Convention, which states: “In the event of damage being caused elsewhere than on the surface of the earth to a space object of one launching State or to persons or property on board such a space object by a space object of another launching State, the latter shall be liable only if the damage is due to its fault or the fault of persons for whom it is responsible.”

For the purposes of international space law, “the term liability is often used specifically to denote the obligation to remedy any damage caused, especially in the

²⁹ Carl Q. Christol, *Space Law: Past, Present, and Future* (Deventer: Kluwer Law and Taxation Publishers, 1991) at 260.

³⁰ *Corfu Channel, Merits, (UK v Albania)* [1949] ICJ Rep 4 at 23-34.

³¹ *Rainbow Warrior (New Zealand v France)*, (1990) 20 RIAAA 217 at 251.

³² *Chorzów Factory (Germany v. Poland)*, (1928) PCIJ (ser. A) No 17 at 47.

³³ Bin Cheng, “Article VI of the 1967 Space Treaty Revisited” (1972) 26 J Space L 7 at 13-14. [Cheng, “Article VI”]

³⁴ *Ibid* at 15.

³⁵ *Ibid*.

³⁶ *Corfu Channel, supra* note 30 at 22-23.

form of monetary payment.”³⁷

Given this regime, “[s]ervice providers must therefore take out risk coverage and pay insurance premiums, also covering the State’s share of international liability the costs incurred are then transferred to service users.”³⁸ Additionally, an absolute liability standard will be applied to damage caused by a space object on the surface of the Earth or to an aircraft in flight.³⁹ This is, in fact, where damage is most likely to be caused by a sub-orbital craft, given the limited time (if any) they will spend in proximity to other space objects. That said, if they should cause damage to another space object, liability would be allocated on a fault basis.⁴⁰ There has been no case law decided on the basis of the international space law treaties.⁴¹ .⁴² It is worth noting that the Liability Convention has been used only once since its inception: it was referenced by Canada in the diplomatic exchanges resolving the Cosmos 954 crash in the Northwest Territories.

In space law, “[i]t should be noted that although liability under the abovementioned treaties is *unlimited*, in some cases national law does provide for caps or limits, often in combination with obligatory insurance. This implies that the state will assume any risks beyond those limits, as it, under the treaties, is subject to unlimited liability.”⁴³ Insurance can be taken out for an operator’s “peace of mind” or in order to comply with certain national legislation, and can include related organizations or States as coinsured. “The insurance industry can help in managing private investment risks against property, financial and liability losses. The insurers, however, need to make use of particularly careful, anticipatory risk valuations, competent inspectors and highly specialized know-how in pricing and claims handling.”⁴⁴ Insurers will create a ‘risk map’ to assess the severity of a possible occurrence and its probability in order to set the price at which they are willing to accept the risk.⁴⁵ Unfortunately for those seeking insurance for space activities, they are generally on the far right of such a map, leading to volatile, reactive, and high insurance rates.⁴⁶ For example, in late 2001 Munich Re (a major space insurer) announced a rate increase of 50% for launch insurance and 75% for on-orbit insurance.⁴⁷ In a different kind of example, the estimated total damage from the

³⁷ Cheng, “Article VI” *supra* note 33 at 9-10.

³⁸ Sgrosso, *supra* note 7 at 485.

³⁹ *Liability Convention*, *supra* note 23, art II.

⁴⁰ *Ibid*, art III.

⁴¹ Tanja Masson-Zwaan, “Liability and Insurance for Suborbital Flights” (Versailles, 2012) Proceedings of the 5th IAASS Conference ‘A Safer Space for a Safer World’ at 3.

⁴² Manikowski, *supra* note 6 at 147.

⁴³ *Ibid* at 3.

⁴⁴ Lovier Schoffski and Andre Georg Wegener, “Risk Management and Insurance Solutions for Space and Satellite Projects” (1999) 24:2 203 at 203, *citing* P.J. Blassel, “Space Projects and the Coverage of Associated Risks” (1985) 10 The Geneva Papers on Risk and Insurance 36 at 51-83.

⁴⁵ Masson-Zwaan, *supra* note 41 at 4.

⁴⁶ *Ibid* at 5.

⁴⁷ Jeff Foust, “Insurance woes may hurt space industry” (7 Nov, 2001) online: Spaceflight Now <<http://spaceflightnow.com/news/n0111/07insurance/>>.

Columbia space shuttle tragedy is US\$3 billion,⁴⁸ though NASA only received US\$500,000 in claims for property damage.⁴⁹ Third party liability insurance, is generally relatively inexpensive to acquire, particularly given that governments are sometimes included as joint insureds.⁵⁰ As you can see from the Columbia example, it is not uncommon for most damage sustained to be “first party” damage.

U.S. LIABILITY & WAIVERS

Aerospace companies in the U.S. continue to cite commercial enterprises of foreign governments and use of industrial policy to continue to justify the favorable U.S. government-industry risk-sharing regime in U.S. launch law.⁵¹ “This regime is comprised of mandatory cross-waivers of liability, insurance and financial responsibility requirements, and conditional catastrophic indemnification.”⁵² Liability for space activities is addressed at the national level in the U.S. through the Commercial Space Launch Act.⁵³ A three-tier liability regime requires that a licensee maintain insurance or be able to self-insure for the Maximum Probable Loss (MPL) up to \$500 million. MPL calculations have been as low as \$3 million and as high as \$268 million.⁵⁴ Congress can allocate funds to indemnify the licensee for the amount between the MPL and \$2 billion (as adjusted for inflation after January 1, 1989), and the licensee will be liable for any amounts in excess of the inflation-adjusted \$2 billion.⁵⁵ Additionally, cross-waivers of liability must be maintained between the licensee and all commercial entities that are involved in the activity, including contractors and subcontractors, as well as between those parties and the U.S. government for amounts in excess of the mandated insurance coverage.⁵⁶ According to FAA calculations, there is less than a one in ten million chance of a loss exceeding the required insurance and triggering U.S. government liability.⁵⁷

The cross-waiver of liability provisions specifically exclude spaceflight participants with regard to the commercial operator, though they require a waiver

⁴⁸ Manikowski, *supra* note 6 at 141.

⁴⁹ *Ibid* at 148.

⁵⁰ Masson-Zwaan, *supra* note 41 at 5.

⁵¹ Joanne Irene Gabrynowicz. “One Half Century and Counting: The Evolution of U.S. National Space Law and Three Long-Term Emerging Issues” (2010) 4:2 Harv L & Pol’y Rev 405 at 410-412.

⁵² Michael Mineiro, “Assessing the Risks: Tort Liability and Risk Management in the Event of a Commercial Human Space Flight Vehicle Accident” (2009) 74 J Air L & Com 371 at 392.

⁵³ 51 USC § 50901 et seq.

⁵⁴ Schaeffer, *supra* note 14 at 13.

⁵⁵ 51 USC §§ 50914-50915. As of 2012, the inflation-adjusted amount is approximately \$2.7 billion; *Necessary Updates to the Commercial Space Launch Act*, U.S. House of Representatives Committee on Science, Space, and Technology, Subcommittee on Space (February 4, 2014) at 3; citing GAO-12-767T, *Testimony before the Science, Space, and Technology Committee, June 6, 2012* at 5, available at <<http://www.gao.gov/assets/600/591391.pdf>>.

⁵⁶ 51 USC §§ 50914-50915.

⁵⁷ Schaeffer, *supra* note 14 at 13.

of liability from the spaceflight participant to the federal government.⁵⁸ “This exclusion leaves open the possibility of CHSF [commercial human space flight] operators suing manufacturers for indemnification of damages paid to injured SFPs. Manufacturers may also be sued for indemnification of damages paid to injured third parties.”⁵⁹ Spaceflight participants are specifically excluded from government third party indemnification.⁶⁰

“While states are prohibited from having laws inconsistent with federal law, the [Commercial Space Launch Act] specifically grants states the authority to implement law in addition to or more stringent than a requirement of, or regulation prescribed under, the Act.”⁶¹ As regulation of the space industry by individual States has not been pre-empted, State and local legislation is permitted to the extent that it does not conflict with federal regulation.⁶² Several US states have undertaken legislative activity with the intention to attract space tourism. Such state law incentives include spaceport incentives intended to leverage existing facilities, establishment of space authorities and industry-favorable liability regimes dealing with the federal informed consent rules.⁶³ Virginia pioneered Spaceflight Liability and Immunity Acts for spaceflight participants (or simply “participants” as these acts universally call them) in 2007.⁶⁴ Since then, Florida, California, Texas, New Mexico and Oklahoma have followed suit.⁶⁵ The content of these acts is remarkably similar, though there are a few notable differences of which to be aware. All of the acts specify that, if the procedures of the act are followed, a spaceflight entity will not be liable for a participant injury resulting from the risks of spaceflight activities.⁶⁶ Liability waivers are based on the principle of *volenti non fit injuria*; there is no injury to one who consents.⁶⁷ A liability waiver is a contract modifying the rights of parties under tort law, and is generally upheld in the U.S. with regard to adventure activities in circumstances where it has been properly drafted and

⁵⁸ 51 USC 50914(b).

⁵⁹ Mineiro, “Assessing the Risks,” *supra* note 52 at 397.

⁶⁰ 14 CFR 401; 51 USC 50902(21)

⁶¹ *Commercial Space Launch Activities Act*, 51 U.S.C. § 50919 (2010); Mineiro, “Assessing the Risks,” *supra* note 52 at 381.

⁶² Patricia Margaret Sterns & Leslie I. Tennen, “State and Municipal Regulation of the Aerospace Industry in the United States” in Ram S. Jakhu (ed) *National Regulation of Space Activities* (Springer, 2010) 467 at 468.

⁶³ Gabrynowicz, *supra* note 51 at 420.

⁶⁴ *Spaceflight Liability and Immunity Act*, Va H.B. 3184, §8.01-227.8 & §8.01-227.9 (2007) [VA Spaceflight Act].

⁶⁵ *Spaceflight Informed Consent Bill*, Fla S.B. 2438 (2008) [FL Informed Consent]; *Spaceflight Liability and Immunity Act*, 5 Ca Civil C tit 7 § 2210 (2012) [CA Spaceflight Act]; *Limited Liability for Space Flight Activities Act*, Tex Civ Prac C tit 4 Ch 100A (2011) [TX Spaceflight Act]; *Spaceflight Informed Consent Act*, N Mex S.B. 240 (2013) [NM Informed Consent]; *Spaceflight Liability and Immunity Act*, Okla Stat tit 3 § 351 (2013) [OK Spaceflight Act].

⁶⁶ VA Spaceflight Act, *supra* note 62; FL Informed Consent, *supra* note 63; CA Spaceflight Act, *supra* note 63; NM Informed Consent, *supra* note 63; OK Spaceflight Act, *supra* note 63.

⁶⁷ Suzen M. Grieshop Corrada, “Liability Waivers in the United States Travel and Adventure Sports Industry” (2006) 2006 Int’l Travel LJ 156 at 156.

consented to by a participant, though some states will not enforce these contracts on public policy grounds.⁶⁸ “[I]t is generally agreed that the liability waiver: (1) must not violate public policy; (2) must have been procured through adequate consideration; (3) must contain clear and unambiguous language; and (4) the signatory must have the capacity to contract.”⁶⁹ Generally speaking, these waivers cannot include gross negligence or recklessness.⁷⁰ Some courts have held such waivers against public policy where a public duty is involved,⁷¹ which would not be the case with regard to space tourism.

These forms, however, are not always accepted or enforceable in other jurisdictions, and thus may not provide a useful model moving forward with regard to the development of national or international space regulation. Waivers are useful in that they “efficiently shift the risk to those participants who are explicitly willing to bear the risk of unforeseeable accidents, and leaves the risk of foreseeable accidents to those (the space flight companies) who are able to take measures to prevent them.”⁷²

THE IMPACT OF EXPORT CONTROLS

Insureds are under a strict contractual obligation to provide technical and non-technical data in the form of underwriting information; failure to provide this information can result in the denial of a claim.⁷³ Not only are technical details required by the insurer in order to initially underwrite the policy, but space insurance policies typically contain a material changes condition requiring that the insured notify the insurer of any material changes; failure to notify would result in lack of coverage in a case where the change led to a loss.⁷⁴

Satellites and related technologies have generally fallen under the set of regulations known as the International Traffic in Arms Regulations (ITARs), which are administered by the U.S. Department of State,⁷⁵ though the National Defense Authorization Act of 2013 has authorized the U.S. president to move satellite technologies from the ITAR list to the Commerce Control List (CCL).⁷⁶ Items that are on the CCL are subject to the less restrictive Export Administration Regulations (EARs), which are administered by the Department of Commerce and which require a license to export. President Obama has undertaken an initiative to revise the

⁶⁸ *Ibid* at 156-157.

⁶⁹ *Ibid* at 157.

⁷⁰ *Ibid* at 158.

⁷¹ John O. Spengler & Bruce B. Hronek, *Legal Liability in Recreation, Sports, and Tourism* (Sagamore Publishing, 2011) 69.

⁷² Christopher D. Johnson, “The Texas space flight liability act and efficient regulations for the private commercial space flight era” (2013) *Acta Astronautica* 226 at 233.

⁷³ Montpert, *supra* note 8 at 285.

⁷⁴ Tucker, *supra* note 16 at 128.

⁷⁵ U.S. Department of Commerce & Federal Aviation Administration, *Introduction to U.S. Export Controls for the Commercial Space Industry* (2008), available at <<http://www.space.commerce.gov/library/reports/2008-10-intro2exportcontrols.pdf>>.

⁷⁶ *National Defense Authorization Act for Fiscal Year 2013*, U.S. Pub.L. 112-239.

export control regime, clarifying those items that are included on the list and those that can be moved to the CCL.⁷⁷ Under Department of Commerce rules, companies can determine themselves whether their activity is exempt from licensing, unlike with regard to ITARs.⁷⁸ Revisions have been made to Category IV of the U.S. Munitions List (subject to ITARs), which includes launch vehicles.⁷⁹

Exporting, in the context of ITARs, is defined broadly and includes not only physically sending or taking an article beyond the borders of the U.S., but also transferring control or ownership (including on-orbit transfer), and notably disclosing technical data to foreign persons (in the U.S. or elsewhere, including oral or visual disclosure).⁸⁰ The Directorate of Defense Trade Controls can issue authorizations in the forms of licenses, agreements, or exemptions for exports.⁸¹ Any launch of U.S. satellite technology from a non-U.S. territory or involving non-U.S. entities or personnel will require compliance with ITAR requirements; this includes participation in multinational launch consortia. With respect to an SPS system, the respective ITARs and EARs must be followed, and the FAA will verify appropriate licensing before a launch license is provided.

There are not many insurers worldwide that maintain specialized space risk departments. Those that do are based in the U.S., U.K., France, Italy, Switzerland, and Germany.⁸² Export controls also apply to technical data furnished to insurers, causing serious difficulty obtaining quotes for insurance premiums and obtaining reinsurance.⁸³ Where such a significant proportion of total cost of a project is dedicated to insurance premium, barriers to both price and policy shopping are highly undesirable. Furthermore, with the shifting U.S. export control regulations, consistent monitoring is necessary for efficient and effective compliance.⁸⁴

RECOMMENDATIONS AND FINAL THOUGHTS

Some have suggested that longer-term or higher government indemnification caps provided by the U.S. government would serve to foster the development of the U.S. commercial space industry. “[T]here is no indication from the insurance industry that rates would be significantly impacted by the US government agreeing to take on additional third party liability for a prolonged period of time.”⁸⁵ Given the low probability of triggering the existing government indemnification limits cited by the FAA, this change seems it would be an unnecessary one to strive for where other

⁷⁷ 79 FR 22740 (2013).

⁷⁸ Matthias Creydt and Kay-Uwe Horl, “Export Control Issues in Space Contracts” in *Contracting for Space*, Lesley Jane Smith & Ingo Baumann, eds (Burlington: Ashgate, 2012) at 292.

⁷⁹ 79 FR 34 (2013).

⁸⁰ 22 CFR § 120.17.

⁸¹ 22 CFR § 120.

⁸² Montpert, *supra* note 8 at 286.

⁸³ Creydt and Horl, *supra* note 78 at 293.

⁸⁴ *Ibid* at 293.

⁸⁵ Schaeffer, *supra* note 14 at 12.

reforms are so critically needed. Modifications to export control regimes that impact the ability to shop for insurance and to provide sensitive technical data to insurers are a much higher priority with regard to legal impediments in the insurance and liability regime. Export control regulations are only effective when States cannot obtain the restricted supplies from third States;⁸⁶ when they can, the intended purpose of said restrictions are eroded, as is the relevant national industry.

I echo the insurance recommendations made by Stephen Tucker over twenty years ago that are still relevant today: imprecise or ambiguous language is to be avoided, proof of loss requirements must be understood and adhered to by insureds, insureds should focus efforts to mitigate any losses that would be covered under the policy, and insureds must update the insurer with any information pertinent to the policy through its life.⁸⁷ Though this paper has focused on issues of space law, it is not to be forgotten that there is a large body of well-developed insurance law that likewise applies to the space insurance industry and will be applied in the case of contractual disputes surrounding a contract for space insurance.

Though this paper has not focused on issues of safety, it has addressed liability waivers that are extensively in place in the U.S., in addition to its main focus, which has been liability insurance. “It should become evident that neither waivers of liability nor liability insurance policies taken out...neither wholly negate nor fundamentally disrupt the calculations that space flight entities should take in deciding how to evaluate risk and safety.”⁸⁸ It is in the best interests of spaceflight entities, as rational actors, to ensure a reasonable degree of safety, even where such options as waivers and insurance exists. Thus, it should not be considered that in the presence of such tools that safety will inherently or automatically degrade. To conclude, it is critical to note that commercial entities will generally prefer legal frameworks that provide the greatest degree of legal certainty, leaving less for the courts to decide if a dispute should arise.⁸⁹ Thus, for both insurers and regulators, legal certainty is a laudable goal.

⁸⁶ Creydt and Horl, *supra* note 78 at 291.

⁸⁷ Tucker, *supra* note 16 at 139.

⁸⁸ Johnson, *supra* note 72 at 233.

⁸⁹ Michael Gerhard and Kamlesh Gungaphul-Brocard “The Impact of National Space Legislation on Space Industry Contracts” in *Contracting for Space*, Lesley Jane Smith & Ingo Baumann, eds (Burlington: Ashgate, 2012) at 63.