

**COMMERCIAL SPACE TRANSPORTATION:
LIABILITY AND INSURANCE**

By

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This is a brief overview of risk allocation and insurance practices in the commercial space transportation industry today. We begin with traditional space transportation, *i.e.*, commercial satellite launches. This is a mature industry with known players. Industry practices have developed and legislation has been adopted in the U.S. and other countries over the past decades to address liability and insurance issues. The primary focus here is on U.S. law, but the discussion of industry practice applies more generally.

We then move on to a more exotic form of space transportation: Commercial human space flight. Several private companies are now signing up space tourists for commercial suborbital human space flight, advertised to become available in the near future. The United States amended its launch legislation in 2004 to promote commercial human space flight. But questions remain as to how this new industry will respond to the risk allocation regime established by the U.S. legislation, which leaves both the space flight operator and space tourist exposed to risk and potential liability.

1. **COMMERCIAL SATELLITE LAUNCHES**

1.1. **Waivers of Liability Between Launch Participants**

It is commercial space industry practice, and in the U.S., a statutory requirement under the Commercial Space Launch Act,¹ that the satellite customer and launch provider agree to a reciprocal waiver of liability and assumption of risk for death, bodily injury, or property damage which they or their employees may suffer as a result of the launch.² This means that if the launch fails and the satellite is lost, the satellite customer may have no recourse against the launch provider, even if the launch provider was negligent.³

¹ Codified at 49 U.S.C. § 70101-70121 (2004).

² 49 U.S.C. § 70112(b)(1); 14 C.F.R. § 440.17(b) (2006). *See* 49 U.S.C. § 70102(4); 14 C.F.R. § 401.5 (2008) (defining “launch” broadly to include also preparatory activities at the launch site). The parties may agree contractually to extend the waiver beyond bodily injury and property damage, *e.g.*, to include financial harm. *See also* Section 1.4, below (discussing launch risk guarantees often offered by launch providers). The purpose of the waivers is: 1) to limit the total universe of claims that otherwise would arise from a launch failure; and 2) to eliminate the need for each launch participant to obtain property and casualty insurance, which would strain the total insurance capacity available for one launch. *Commercial Space Launch Act Amendments 1988, Report of the Senate Committee on Commerce, Science, and Transportation on H.R. 4399*, S. REP. No. 100-593 (Oct. 7, 1988) (“1988 CSLA Senate Report”), at 14. A tripartite waiver with the U.S. government is also required where government property or government agencies are involved. 49 U.S.C. § 70112(b)(2); 14 C.F.R. § 440.17(c) (2006). *See also* Loi No. 2008-518 du juin 2008 relative aux opérations spatiales, enacted June 3, 2008 (“French Space Operations Act”), Title IV, Ch. II (concerning inter-party liability).

³ *See however Martin Marietta Corp. v. International Telecommunications Satellite Organization*, 991 F.2d 94, 100 (4th Cir. 1993) (“[N]either the language of the [CSLA] Amendments nor their legislative history reflects a Congressional intent to protect parties from liability for their own *gross* negligence.”) (emphasis added).

It is likewise industry practice, and a statutory requirement in the U.S., that the parties to the liability waiver (the satellite customer and launch provider) “flow down” the waiver to their respective contractors and subcontractors that are involved in the launch, requiring them not to claim against the other party and its contractors and subcontractors.⁴ The U.S. statutory waivers relate only to bodily injury and property damage and are not intended to prevent or encumber the enforcement of contractual rights and obligations.⁵

1.2. **The Launch Provider Obtains Third Party Liability Insurance**

It is industry practice, and in the U.S. a statutory requirement, that the launch provider obtain third party liability insurance to cover the launch and that the insurance protect the launch provider and the satellite customer, as well as the parties’ respective contractors and subcontractors involved in the launch.⁶ This insurance is intended, e.g., for situations where the launch vehicle veers off course, crashes into the ground, and causes death, bodily harm, or property damage to persons not connected with the launch.⁷ Such situations are extremely rare because of the availability of flight termination systems and the use of launch trajectories over unpopulated areas.

Under U.S. law, the FAA specifies the amount of insurance required based on a “maximum probable loss” assessment.⁸ The insurance requirement varies, depending on the launch vehicle, launch site, and launch trajectory, among other parameters, but cannot exceed \$500 million.⁹ In practice, it is much less, and at most \$264,000,000.¹⁰ The launch provider is required to name as “additional insureds” its contractors and subcontractors, the satellite customer and its contractors and subcontractors, as well as the U.S. government and its agencies participating in the launch.¹¹

⁴ 49 U.S.C. § 70112(b); 14 C.F.R. § 440.17(b)-(e). *See* 14 CFR § 440.17, Appendix B, art. 4 (2006) (containing the required waiver form).

⁵ 1988 CSLA Senate Report, *supra* note 2, at 14.

⁶ 49 U.S.C. § 70112(a)(1) and (4); 14 C.F.R. § 440.09(b) (2006). *See also* French Space Operations Act, Title IV, Ch. I, art. 6 (requiring operators to obtain insurance); Australia’s Space Activities Act 1998, No. 123, 1998, art. 48 (concerning insurance); United Kingdom Outer Space Act 1986, 1986 Chapter 38, art. 5.2(f) (concerning insurance).

⁷ *See also* Convention on International Liability for Damage Caused by Space Objects (1972) 961 U.N.T.S. 187, art. II (providing that the “launching state” shall be absolutely liable for damage caused by its space object on the surface of the earth or to aircraft flight); and art. VII (providing that the Convention does not apply to damage done to a launching state’s own nationals).

⁸ 49 U.S.C. § 70112(a)(2); 14 C.F.R. § 440.9(c) (2006).

⁹ 49 U.S.C. § 70112(a)(3).

¹⁰ Financial Responsibility Requirements as Determined by the Maximum Probable Loss (MPL) Process As of January 12, 2007, published by the Office of the Associate Administrator for Commercial Space Transportation, available at http://www.faa.gov/about/office_org/headquarters_offices/ast/licenses_permits/media/mplsum.pdf (last accessed March 31, 2009). Self insurance is permitted, subject to a showing of “financial responsibility.” 49 U.S.C. § 70112(a)(1) and (4); 14 C.F.R. § 440.09(a) (2006).

¹¹ 49 U.S.C. § 70112(a)(4); 14 C.F.R. § 440.09(b).

1.3. **Government Indemnification for Excess Liability**

The U.S. and some other launch-fairing nations provide for government indemnification of third party liability in excess of the insured amount.¹² In the U.S., such indemnification is available up to an amount of approximately \$2,500,000,000,¹³ subject to Congressional appropriation,¹⁴ and would cover the launch provider and its contractors and subcontractors and the satellite customer and its contractors and subcontractors participating in the launch.¹⁵

The provision for U.S. government indemnification was adopted in 1988, and was deemed to be necessary because of a Congressional determination that there was not sufficient insurance capacity available in the world insurance market at a reasonable cost to cover the worst-case, catastrophic event and that launch companies should not be asked to bet the company.¹⁶ The provision expires on December 31, 2009,¹⁷ although industry is lobbying to prevent the sunset.

1.4. **Satellite Launch Insurance and In-Orbit Insurance by the Satellite Operator**

It is typical for commercial satellite operators to take out property insurance for loss of or damage to the satellite during launch and at least the first year in orbit.¹⁸ In-orbit insurance is typically renewed on an annual basis, subject to a satellite “health” evaluation by the insurers. In addition to being prudent risk management, insurance may also be a contractual requirement, e.g., under a credit agreement or the satellite manufacturing contract.

Such launch and in-orbit insurance typically covers the satellite, the price of the launch, and the insurance premium. The insurance is provided by the global space insurance market, given the large insured amount, which for a state of the art commercial communications satellite may be in the order of \$200 million or more. Space insurance policies are typically agreed-value policies. Payment under the policy is subject to the terms, conditions, and exclusions of the policy. If the policy is subject to U.S. law, it is the common law (case law) and insurance statutes of the chosen state, e.g., New York, that apply to the interpretation of the policy.

¹² 49 U.S.C. § 70113; 14 C.F.R. § 440.19 (2006). *See also* French Space Operations Act, Title IV, Ch. I, art. 15. *See, however*, United Kingdom Outer Space Act 1986, 1986 Chapter 38, art. 10(1) (concerning indemnification of the U.K. government).

¹³ 49 U.S.C. § 70113(a)(1)(B) (“\$1,500,000,000 (as adjusted for inflation occurring after January 1, 1989) . . .”).

¹⁴ *Id.* at § 70113(a) (“To the extent provided in advance in an appropriation law or to the extent additional legislative authority is enacted providing for paying claims . . .”); 14 C.F.R. § 440.19(a).

¹⁵ 49 U.S.C. § 70113(a); 14 C.F.R. § 440.19(a).

¹⁶ *See* 1988 CSLA Senate Report, *supra* note 2, at 9 (world insurance capacity limited) and 17 (legislation protects launch operators from unlimited liability).

¹⁷ 49 U.S.C. § 70113(f).

¹⁸ Depending on insurance market conditions when the insurance is placed, the initial insurance may extend beyond one year.

Although the satellite operator often takes out insurance to cover the launch price, the satellite operator may alternatively rely on the launch provider to issue a launch risk guarantee. In other words, the launch provider, for a premium, may agree to provide a refund of the launch price or a new launch (but not a new satellite) if the launch fails. The launch provider, in turn, may insure the launch risk guarantee.

2. COMMERCIAL HUMAN SPACE FLIGHT: U.S. LAW

2.1. No Waiver Requirement for Humans, but Informed Consent

The U.S. statutory waiver requirement that bars the satellite customer from suing its launch provider does not apply equally to human space flight. When the U.S. Congress added human space flight provisions to the Commercial Space Launch Act in 2004,¹⁹ it decided that the passenger, referred to as a “space flight participant,”²⁰ would not need to waive its right to sue the space flight operator.²¹ This leaves the space flight operator exposed.

The space flight operator may request the space flight participant to agree to a waiver of liability as part of the space flight agreement. But in the event of an accident where the space flight participant is killed or injured, such waivers are sure to be challenged, at least in the U.S., especially given the lack of federal statutory support. Waivers of liability for negligent conduct are generally disfavored by U.S. courts.²² At a minimum, such waivers must use precise, plain, and unequivocal language²³ and must be unambiguous,²⁴ specific,²⁵ conspicuous,²⁶ and explicit.²⁷ Waivers are generally defeated by gross

¹⁹ Commercial Space Launch Amendments Act, P.L. 108-492 (Dec. 23, 2004).

²⁰ 49 U.S.C. § 70102(17) (defining space flight participant as an “individual, who is not crew, carried within a launch vehicle or reentry vehicle.”).

²¹ A space flight participant is not a “customer” for purposes of the U.S. statutory waiver requirement (*see supra* note 2). 14 C.F.R. § 440.3 (2006). *See, however*, 49 U.S.C. § 70112(b)(2); 14 C.F.R. § 440.17(e) (2006); 14 C.F.R. § 440.17, Appendix E (2006) (requiring the space flight participant to sign a waiver with the U.S. government).

²² *See, e.g., Van Dyke v. Eastman Kodak Co.*, 239 N.Y.S.2d 337, 349 (N.Y. 1963) (“The law looks with disfavor upon attempts of a party to avoid liability for his own fault . . .”); *Applbaum v. Golden Acres Farm and Ranch*, 333 F. Supp. 2d 31, 35 (N.D.N.Y. 2004) (“It is well established that ‘the law frowns upon contracts intended to exculpate a party from the consequences of his own negligence . . .’”).

²³ *See, e.g., Commercial Union Ins. Co. v. Blue Water Yacht Club Assoc.*, 239 F. Supp. 2d 316, 322 (E.D.N.Y. 2003) (“plain language”); *Van Dyke*, 239 N.Y.S.2d at 340 (“unequivocal terms”); *Gross v. Sweet*, 49 N.Y.2d 102, 107 (N.Y. 1979) (“unmistakable language”).

²⁴ *See, e.g., Gross*, 49 N.Y.2d at 107.

²⁵ *See, e.g., Ash v. NYU Dental Center*, 564 N.Y.S.2d 308, 310 (N.Y. App. Div. 1990) (citations omitted) (requiring “sufficient specificity and clarity” for exculpatory clauses to be enforced).

²⁶ *Arce v. U-Pull-It Auto Parts, Inc.*, 2008 U.S. Dist. LEXIS 10202, *27 (E.D.Pa. 2008).

²⁷ *See, e.g., Commercial Union Ins. Co.*, 239 F. Supp. 2d at 322.

negligence.²⁸ Furthermore, some U.S. states, e.g., New York, have laws that simply prohibit waivers of liability in contracts with recreational and similar establishments.²⁹

The space flight operator is required by law to inform the space flight participant of the risks “of the launch and reentry, including the safety record of the launch or reentry vehicle type,” and the space flight participant must provide its “written informed consent.”³⁰ This is at most an assumption of the risk normally inherent in space flight. It is not an assumption of, and much less a waiver of liability for, any enhanced exposure to injury occasioned by carelessness of a space flight operator.³¹

2.2. **State Statutes to Protect Space Flight Operators From Liability**

To encourage human space flight and help attract space flight operators to space ports in their respective states, Virginia³² and Florida³³ have adopted legislation attempting to immunize space flight operators from liability. The legislation is aimed at exculpating space flight operators from claims by space flight participants for injuries or damage resulting from the risks of space flight activities,³⁴ except in cases of gross negligence or willful misconduct.³⁵ Both statutes require the space flight participant to sign a warning statement.³⁶ Although well-intentioned, the efficacy of these laws is open to question, given loop holes and the likelihood of plaintiff forum shopping.

2.4. **Third Party Liability Insurance Not Required for Space Flight Participants**

Under U.S. law, human space flight operators are required to take out third party liability insurance for death, bodily injury, or property damage of third parties.³⁷ The insurance must include as “additional insureds” the space flight operator’s contractors and subcontractors and the United States government, but *not* the space flight participant.³⁸ While not mandatory, the space flight operator may choose to commit contractually to protecting the space flight participant against third party liability.

²⁸ See *Martin Marietta Corp.*, 991 F.2d at 100 (4th Cir. 1992), *supra* note 3; *Gross*, 49 N.Y.2d at 106 (citations omitted) (“To the extent that agreements purport to grant exemption for liability for willful or grossly negligent acts they have been viewed as wholly void.”).

²⁹ NY GEN. OBLIG. LAW § 5-326 (2009) (declaring “void and unenforceable” any “[a]greements exempting [recreation] and similar establishments from liability for negligence . . .”).

³⁰ See 49 U.S.C. § 70105(b)(5)(A)-(C); 14 C.F.R. § 460.45(a)-(f) (2007).

³¹ See, e.g., *Applbaum*, 333 F. Supp. 2d at 35 (The court found that the assumption of risk only pertained to inherent risks and did not extend to enhanced exposure due to carelessness) (*citing Gross*, 49 N.Y.2d at 106 (1979)).

³² VA. CODE ANN. § 8.01-227.8-.10 (2007).

³³ FLA. STAT. § 331.501 (2009).

³⁴ VA (exculpating a “space flight entity” from liability for “a participant injury resulting from the risks of space flight activities,” where the participant has given informed consent); FL (“a spaceflight entity is not liable for injury to or death of a participant resulting from the inherent risks of spaceflight activities so long as the [mandated warning] is distributed and signed . . .”).

³⁵ VA. CODE ANN. § 8.01-227.9(B)(1); FLA. STAT. § 33.501(2)(b)(1).

³⁶ VA. CODE ANN. § 8.01-227.10(a); FLA. STAT. § 331.501(3)(a).

³⁷ 49 U.S.C. § 70112(a)(1); 14 C.F.R. § 440.09(b).

³⁸ 49 U.S.C. § 70112(a)(4); 14 C.F.R. § 440.09(b).

Space flight participants are also not considered beneficiaries of the mandatory third parties liability insurance required under the Commercial Space Launch Act.³⁹

2.5. **Government Indemnification, But Not for “Space Flight Participants”**

The U.S. government indemnification potentially available for third party liability in excess of the insured amount (see 1.3, above) protects the space flight operator and its contractors and subcontractors,⁴⁰ except when it is operating under an experimental permit.⁴¹ But the Commercial Space Launch Act exempts “space flight participants” from receiving such U.S. government indemnification.⁴²

2.6. **Insurance for Space Flight Participants and Space Flight Operator Liability**

Space tourists that have visited the International Space Station (“ISS”) reportedly have taken out their own insurance.⁴³ For example, in a contract between Space Adventures, the flight organizer, and Daisuke “Dice-K” Enomoto (who for health problems was not permitted to fly), Mr. Enomoto was required to maintain life and health insurance “sufficient to cover all losses connected with any bodily injury, severe injury, temporary or permanent loss of general ability to work, or any other injury [resulting from his participation in the spaceflight]”⁴⁴ The U.S. Commercial Space Launch Act does not apply to ISS launches.

Several U.S. companies, such as, Virgin Galactic, Blue Origin, and XCOR are now in various stages of design, testing, development, and prototyping of commercial suborbital vehicles intended to carry people into space and back. While these companies initially may require space flight participants to obtain their own insurance, at least some of these companies are now considering models for providing, or offering at a premium, insurance to their space flight participants.

Space flight operators are also evaluating ways to protect themselves against liability from claims by space flight participants or their survivors or financial sponsors (the

³⁹ 49 U.S.C. § 70102(21); 14 C.F.R. § 440.03 (not including them in the definition of “third party”).

⁴⁰ 49 U.S.C. § 70113(a); 14 C.F.R. § 440.19(a).

⁴¹ 49 U.S.C. § 70113(f) (“[Indemnification] does not apply to permits”).

⁴² *Id.* § 70113(a) (“[T]he Secretary of Transportation shall provide for the payment by the United States Government of a successful claim . . . of a third party against a licensee or transferee . . . , a contractor, subcontractor, or customer of the licensee or transferee, or a contractor or subcontractor of a customer, *but not against a space flight participant.*”) (emphasis added).

⁴³ Dennis Tito, the first space tourist, in 2001, was reported to have been issued life insurance by Russian insurer Avikos, in addition to other insurance he had obtained. See Interfax, Tito Has His Space Travel Insurance, Apr. 26, 2001, available at http://www.space.com/missionlaunches/launches/tito_insurance_010427.html (last accessed Mar. 31, 2009).

⁴⁴ Orbital Space Flight Purchase Agreement between Space Adventures and Dice-K Enomoto, Nov. 2, 2004, attached to Space Adventures court filing Jan. 12, 2009, Ex. 3. The contract is Exhibit 3 in Memorandum of Law in Support of Defendant’s Motion to Dismiss Plaintiff’s Amended Complaint, Case No. 1:08cv861-JCC/TCB (U.S. District Court for the Eastern District of Virginia, Alexandria Division).

sponsor may be required to agree to a liability waiver⁴⁵), subrogees, and others. As a general proposition, state statutes and contractual waivers alone cannot be relied upon to provide adequate liability protection, and insurance will be required. *Federally mandated* contractual waivers by space flight participants or liability caps would be helpful to complement insurance solutions. Eventually, as the industry matures, such practices could be extended to an international legal regime.

⁴⁵ See 49 U.S.C. § 70112(b)(1); 14 C.F.R. § 440.17(b)-(c) (waiver requirement with respect to customers involved in the launch). “Customer” is defined as

(1) Any person: (i) Who procures launch or reentry services from a licensee or permittee; (ii) With rights in the payload (or any part of the payload) to be launched or reentered by the licensee or permittee, including a conditional sale, lease, assignment, or transfer of rights; (iii) Who has placed property on board the payload for launch, reentry, or payload services; or (iv) To whom the customer has transferred its rights to the launch or reentry services. (2) A space flight participant, for the purposes of this part, is not a customer.

14 C.F.R. § 440.3.

A sponsor may qualify as a customer.