

**SUBCOMMITTEE ON SPACE AND AERONAUTICS  
COMMITTEE ON SCIENCE, SPACE, AND TECHNOLOGY  
U.S. HOUSE OF REPRESENTATIVES**

***An Examination of Future Commercial Launch Markets & FAA's Launch  
Indemnification Program***

Wednesday, June 6, 2012

10:00 a.m. – 12:00 p.m.  
2318 Rayburn House Office Building

**Purpose**

The FAA's Office of Commercial Space Transportation (AST) manages a federally-sponsored liability risk-sharing regime (commonly referred to as "indemnification") for third party loss (injury or property damage to the uninvolved public) during launch and reentry of a licensed commercial launch system. The current authorization for indemnification expires December 31, 2012. The hearing will review FAA's management of the program and discuss future commercial launch markets.

**Witnesses**

- **Dr. George Nield**, Associate Administrator for the Office of Commercial Space Transportation, FAA;
- **Ms. Alicia Cackley**, Director of Financial Markets and Community Investment Team, Government Accountability Office;
- **Mr. Frank Slazer**, Vice President, Space Systems, Aerospace Industries Association;
- **Ms. Alison Alfers**, Vice President, Defense and Intelligence, DigitalGlobe Inc.

**Commercial Space Launch and Reentry "Indemnification" Summary**

- All commercial launches licensed by the FAA are required to purchase third party liability insurance up to a Maximum Probable Loss (MPL) value calculated by the FAA.
- U.S. government indemnification only covers a portion of third party liability claims in the event of a catastrophic loss during launch or reentry activity.
- No federal payments, which are subject to Congressional appropriations, have ever been required.
- Indemnification **does not** cover spaceflight participants, crew or payloads.
- Similar to the launch indemnification regimes of other space-faring nations.

## **Background**

On May 22, Space Exploration Technology Inc. (SpaceX) launched the first commercial space mission to the International Space Station (ISS). While the mission is notable for the destination, the first commercial space launch took place in 1989 when Space Services Inc. launched the CONSORT-1 satellite from the White Sands Missile Range in New Mexico on a Starfire suborbital rocket. Later that year, the McDonnell Douglas Space Systems Company conducted the first commercial orbital mission when it launched a Delta II rocket from the Cape Canaveral Air Force Base carrying the British Satellite Broadcasting-R1 (BSB-R1), a British television direct broadcasting satellite known as Marcopolo 1.

The commercialization of space transportation began in the 1980s. At that time, President Ronald Reagan designated the Department of Transportation (DOT) as the lead agency to regulate the emerging commercial space transportation sector. President Reagan highlighted the commercialization of space transportation in the 1984 State of the Union address;

*The Department of Transportation will help an expendable launch services industry to get off the ground. We'll soon implement a number of executive initiatives, develop proposals to ease regulatory constraints, and, with NASA's help, promote private sector investment in space.<sup>1</sup>*

Later that year, Congress passed the Commercial Space Launch Act (P.L. 98-575) which directed the DOT to establish the insurance requirements that a commercial entity would need to protect against risk to the public (uninvolved third parties) and U.S. government property. With passage of the law, the DOT began working on the appropriate structure for a liability insurance regime for this new industry.

During this time space launch was principally a government-sponsored activity. For instance, NASA would use indemnification authorities pertaining to national defense missions under Public Law 85-804 for the Space Shuttle program. However, prior to the Space Shuttle Challenger accident in 1986, the Space Shuttle was used on occasion to place commercial satellites into orbit (after the loss of the Challenger, U.S. policy directed NASA to transport almost exclusively government payloads on the Space Shuttle). This commercial arrangement also incorporated a risk-sharing scheme described below.

*NASA required shuttle payload customers to obtain the maximum liability insurance available at a reasonable premium, and NASA provided indemnification for any amount in excess of that coverage. Typically, \$500 million was required for a single payload, and*

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<sup>1</sup> President Ronald Reagan, State of the Union Address, January 25, 1984

*multiple payload customers could combine their contributions to reach \$750 million in coverage<sup>2</sup>.*

Launch providers and the government had established liability policies during the era of serving principally government customers and a similar arrangement was needed to manage catastrophic risk with the introduction of commercial launch services. In the 1980s, the regulation of the commercial space launch industry was beginning to take shape and both industry and government officials proposed more definitive risk-sharing regimes.

### **Third-Party Liability Risk-Sharing Regime**

In 1988, Congress passed the Commercial Space Launch Act Amendments (P.L. 100-657) which established the current insurance requirements and tiered liability risk-sharing regime for FAA-licensed commercial space launches. The liability and insurance regime was originally modeled on the Price-Anderson Act that governs liability risk-sharing under the nuclear power industry.

The indemnification regime is comprised of a three tiered risk-sharing arrangement wherein both the U.S. government and the private sector would cover third party claims. However, the FAA calculates that the chance of loss exceeding the required insurance and thus resulting in potential United States government liability is lower than 1 in 10 million.<sup>3</sup>

#### **Tier 1: Maximum Probable Loss (MPL)-Based Insurance**

The commercial space launch provider is responsible for purchasing third party liability insurance based on a Maximum Probable Loss (MPL) value calculated by the FAA.

*The insurance covers third parties, including government personnel, for injury, loss, or damage, up to a statutory ceiling of \$500 million or the maximum available on the world market at reasonable cost. Insurance against damage to U.S. government property is also required, with a statutory limit of \$100 million or the maximum available on the world market at reasonable cost.<sup>4</sup>*

#### **Tier 2: Payments in excess of the MPL**

In what is commonly referred to as “indemnification,” should any successful third-party claim be in excess of the MPL-based insurance requirement, then the U.S. government is authorized to pay up to an additional \$1.5 billion (adjusted for post-1988 inflation – approximately \$2.7 billion today). The payment is not automatic and subject to Congressional appropriations.

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<sup>2</sup> Study of the Liability Risk-Sharing Regime in the United States for Commercial Space Transportation, August 2006

<sup>3</sup> FAA/AST briefing to staff, May 14, 2012

<sup>4</sup> Study of the Liability Risk-Sharing Regime in the United States for Commercial Space Transportation, August 2006

*Such claims must be presented to the Congress by the President, upon the recommendation of the Secretary of Transportation, and the Congress must appropriate funds to pay the claim. For damage to government property, the U.S. government waives claims for property damage above the required insurance.<sup>5</sup>*

### **Tier 3: Payments above MPL-Based Insurance and Indemnification**

The commercial space launch provider (or legally liable party) is responsible for any claims in excess of the first two tiers of the regime.

#### Rationale

The rationale for the original establishment of this regime was partly due to the immature insurance market for the nascent commercial launch industry. As a result, the provision was set to expire after five years in what is commonly called a “sunset provision.” Congress and the administration were to reevaluate the need for this shared-risk approach once the launch industry and insurance markets had time to develop and mature.

However, U.S. industry views the regime as a key element for U.S. commercial competitiveness against foreign launch providers. According to the Aerospace Industry Association (AIA) issue paper titled, *Renew U.S. Commercial Space Launch Competitiveness*, U.S. launch providers must compete with international providers that all benefit from some form of government indemnification. The AIA paper states, “*in a competitive market with narrow returns, the loss of the risk management regime [indemnification] would cause U.S. companies to reconsider the risks and benefits of staying in the commercial launch business, suspend activity, and even exit the market.*”

The Commercial Space Launch Amendments Act of 2004 (P.L. 108-492) directed the FAA to conduct a study of the U.S. government’s risk sharing of third-party liability for commercial space launch providers. The study was completed in 2006 and concluded that the availability of liability insurance on the global market to cover Tier 1 requirements could disappear in the event of single catastrophic loss anywhere in the world. The 2006 study states:

*In such a circumstance, Tier II [indemnification] would become an essential backup to keep the U.S. launch industry alive until the insurance market recovers or other means are found to address liability risk-sharing.*

Since passage in 1988, the provision for the liability risk-sharing regime<sup>6</sup> has been extended by Congress in 1999, 2000, 2004 and 2009. The extensions were contained in the 1999 Department

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<sup>5</sup> Study of the Liability Risk-Sharing Regime in the United States for Commercial Space Transportation, August 2006

<sup>6</sup> 51 USC Sec. 50915 Paying claims exceeding liability insurance and financial responsibility requirements

of Veterans Affairs and Housing and Urban Development and Independent Agencies Appropriations Act, the 2000 Commercial Space Transportation Competitiveness Act, the 2004 Commercial Space Launch Amendments Act and the 2009 Commercial Space Transportation Liability Regime Act.

### Third-Party Liability and U.S. Treaty Obligations

While the third-party liability risk-sharing regime in the United States provides a level playing field for U.S. companies to compete in the international market it does not limit the U.S. government's international liability responsibilities that are prescribed in the Outer Space Treaty of 1967<sup>7</sup> and the Liability Convention of 1974.<sup>8</sup> The Outer Space Treaty states that each country conducting launches is internationally liable for damages within another country should there be an accident. The Liability Convention also assigns liability responsibility and payment of any compensation for losses to the "launching State." Should a commercial space launch from the United States result in damages within another country that exceeds the MPL-based insurance requirements, the U.S. government would be required to settle the claim whether indemnification were in place or not.

### Commercial Space Launch Markets

The 2012 FAA forecast for commercial space launches in the U.S. shows a considerable increase in the amount of activity in the near future. As noted earlier, SpaceX has already conducted a successful commercial FAA-licensed launch and reentry mission to the ISS. Additionally, the Orbital Sciences Corporation is preparing its Antares rocket for two commercial launches this year, first a test flight and then a demonstration flight to the ISS. Under NASA's Commercial Resupply Services (CRS) contract, the two companies are currently scheduled to conduct twenty cargo launch missions to the ISS through 2016. As the ISS is to continue operations until at least 2020, NASA's CRS contract may be extended or re-competed before the current contract expires in 2016. It is anticipated that the cargo transportation demands for ISS could reach as many as twenty additional commercial launches between 2017 and 2020.

NASA's Commercial Crew Program is pursuing the development of commercial launch systems with the goal of establishing one or more companies to provide transportation services to and from the ISS for NASA astronauts. NASA anticipates purchasing crew transportation services as early as 2017. Commercial crew services could add as many as two additional commercial launches to the ISS per year in addition to the cargo missions. According to an FAA forecast, the combined commercial cargo and crew missions to the ISS could number up to fifty-six launches between 2012 and 2020.

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<sup>7</sup> Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and other Celestial Bodies (Outer Space Treaty, 1967)

<sup>8</sup> Convention on International Liability for Damages Caused by Space Objects in Outer Space (Liability Convention, 1974)

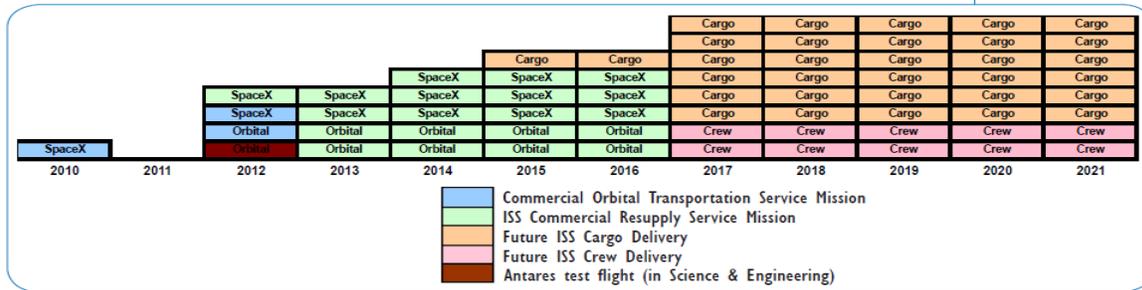


Figure 20. Forecast of COTS, CRS, and commercial crew missions

From 2012 to 2021, the FAA’s forecast predicts nearly 291 commercially procured launches in the global market in support of telecommunications, satellite imagery (remote sensing), cargo and crew transportation missions to the ISS, and science payloads. U.S. launch providers will need to remain competitive to win a significant portion of the future launch contracts over foreign competitors.

Table I. Commercial Space Transportation Payload and Launch Forecasts

	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total	Average
<b>Payloads</b>												
GSO Forecast (COMSTAC)	23	21	20	23	21	20	20	20	22	22	212	21.2
NGSO Forecast (FAA)	37	44	28	35	42	49	16	15	16	15	297	29.7
Total Satellites	60	65	48	58	63	69	36	35	38	37	509	50.9
<b>Launches</b>												
GSO Medium-to-Heavy	19	16	15	18	16	15	15	15	17	17	163	16.3
NGSO Medium-to-Heavy	10	12	13	15	12	16	11	10	11	10	120	12.0
NGSO Small	1	1	0	0	1	1	1	1	1	1	8	0.8
Total Launches	30	29	28	33	29	32	27	26	29	28	291	29.1

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An emerging market for suborbital launch providers (space vehicles that launch into space but do not orbit the Earth) is also predicted to rapidly increase the number of commercial launches over the next decade. In the past, suborbital launches have primarily been in support of missile testing or scientific research conducted by the U.S. government using sounding rockets. The recent development of new commercial suborbital reusable launch vehicles (RLVs) may lead to a significant increase in commercially licensed launches. According to the FAA, suborbital RLV companies are anticipating launch demand for such areas as basic and applied research; aerospace technology test and demonstration; remote sensing; education; media and public relations; commercial human spaceflight; and point-to-point transportation.<sup>11</sup>

<sup>9</sup> FAA Commercial Space Transportation Forecasts, May 2012

<sup>10</sup> FAA Commercial Space Transportation Forecasts, May 2012

<sup>11</sup> The Reusable Suborbital Industry: A Renaissance in the Making, October 2011

## Overarching Questions

- What benefit does the government reap from taking on a portion of launch risks through the current indemnification regime, and does the benefit outweigh the risks?
- Should the indemnification program be continued, and if so, what commercial markets should it serve? In addition to indemnifying traditional communications launches, how well suited is the risk-sharing regime to serve commercial cargo launches to ISS, commercial crew launches carrying astronauts to ISS, and space tourists on either orbital or sub-orbital launches?
- Under the current risk-sharing regime, is the government's risk exposure properly calculated, and is it appropriately weighted relative to insurance purchased from private markets?