

Commercial Space Transportation

# QUARTERLY LAUNCH REPORT

Special Report:

## Commercial Space Transportation Licensing



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## COMMERCIAL SPACE TRANSPORTATION LICENSING

### INTRODUCTION

In order to conduct a commercial space launch or operate a commercial launch site in the U.S., it is necessary to obtain a license from the United States government.

Under the 1972 United Nations Convention on International Liability for Damage Caused by Space Objects, governments are liable for injury or damage to third parties caused by launch vehicles or payloads launched under their jurisdiction.

In order to control this liability and assure public safety, the United States government has created a regulatory framework for the commercial operation of both launch vehicles and launch sites.

### THE OFFICE OF THE ASSOCIATE ADMINISTRATOR FOR COMMERCIAL SPACE TRANSPORTATION (AST)

The Federal Aviation Administration's Associate Administrator for Commercial Space Transportation (AST) licenses and regulates U.S. commercial space launch activity as authorized by Executive Order 12465 and *Commercial Space Launch Activities*, Title 49 of the United States Code, Subtitle IX, Chapter 701 (formerly the *Commercial Space Launch Act of 1984*). AST's mission is to regulate the U.S. commercial launch industry; license commercial launch operations to ensure public health and safety and the safety of property; and protect national security and foreign policy interests of the United

States during commercial launch operations. In addition, the Federal Aviation Administration is directed to encourage, facilitate, and promote commercial space launches.

### WHO MUST BE LICENSED

AST has legislative authority to license any person conducting commercial launch activities (including the operation of a launch site) within the United States. It also has legislative authority in the case of a United States citizen, or an entity operating under United States jurisdiction, conducting a launch or operating a launch site outside of the United States.

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#### Table 1. Who Requires a Launch or Launch Site License?

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Any person conducting a launch operation or operating a launch site within the United States.

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Any United States citizen or entity operating under United States jurisdiction conducting a launch or operating a launch site outside of the United States.

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A foreign entity in which a United States citizen has a controlling interest if that entity wishes to operate in an area that is international and not under United States jurisdiction through some government agreement.

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AST also licenses foreign entities in which a United States citizen has a controlling interest if that entity wishes to conduct launch operations in an area that is both outside the United States and outside of the territory of any foreign nation. If the United States has an agreement to allow another nation to regulate this area, that nation gains jurisdiction. If there is an

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agreement that United States jurisdiction applies to a foreign location, then AST does have responsibility for licensing that launch or launch site.

AST does not review amateur rocket activities (defined as launch activities conducted at private sites involving rockets with a total impulse of 200,000 pound-seconds or less, an operating time of less than 15 seconds, and a ballistic coefficient less than 12 psi). Also, AST does not review space activities conducted by or on behalf of the United States government. However, safety issues are covered through other means.

## COMMERCIAL LAUNCH LICENSING

AST issues two types of launch licenses: launch-specific licenses and launch operator licenses. These differ in that a launch-specific license typically only authorizes the licensee to conduct a single launch. The launch is specified in the license and the license expires when the launch has been conducted. The license will also expire when its expiration date is reached, unless that date is extended.

The second form of launch license, the launch operator license, allows a launch operator to conduct launches of members of a family of vehicles from a given launch site with specified classes of payloads. These licenses are valid for a period of five years from the date of issue.

For either type of license, the first element in licensing a commercial launch vehicle is the pre-application consultation. It consists of any/all meetings, communications, or draft application submittals that a potential applicant may undertake with AST prior to submitting a formal application. Pre-licensing

consultation allows a prospective applicant to familiarize AST with its proposal. Likewise, the potential applicant also becomes familiar with the licensing process. The pre-licensing consultation also provides a potential applicant with an opportunity to identify any unique aspects of its proposal, and develop a schedule for submitting an application.

Following formal submission of an application, a policy review is undertaken in regard to the applicant. The application is reviewed to determine whether it presents any issues affecting U.S. national security or foreign policy interests, or international obligations of the United States. A major aspect of the policy review is an interagency review of each launch proposal. This allows government agencies to examine the proposed mission from their unique perspectives. During the interagency review, AST consults with the Department of Defense, the Department of State, and other federal agencies such as NASA that are uniquely situated to address such issues.

The next element in the licensing process determines whether an applicant can safely launch the vehicle(s) and the payload(s). For applicants proposing to launch from a federal launch range, AST will issue a safety approval only if the applicant demonstrates that there is no unacceptable risk to the public and if the launch services and the proposed use of launch property are within the federal launch range's experience.

The fourth element in the process is a payload review and determination. During this element, AST reviews proposed payloads to determine whether safety and policy issues concerning the launch of the payloads jeopardize public health and

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safety, U.S. national security or foreign policy interests, or international obligations of the United States. AST also reviews payloads to determine whether a license applicant or payload owner or operator has obtained all required licenses, authorization, and permits, unless the payload is exempt from review. This process also includes inter-agency coordination.

AST does not review payloads that are subject to regulation by the Federal Communications Commission (FCC) or the Department of Commerce, National Oceanic and Atmospheric Administration (NOAA); or owned or operated by the U.S. Government.

The fifth element in the licensing process is the financial responsibility determination. The FAA requires that all licensees demonstrate financial responsibility to compensate for the maximum probable loss<sup>1</sup> (MPL) from claims by: a third party for death, bodily injury, or property damage or loss resulting from an activity carried out under the license; and the U.S. government against a person for damage or loss to government property resulting from an activity carried out under the license. AST sets the amount of financial responsibility required of the licensee. The licensee can then elect to meet this requirement by proving it has financial reserves equal to or exceeding the amount specified, by placing the required amount in escrow, or by purchasing liability insurance equal to

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<sup>1</sup> The MPL determination is based on an analysis and assessment of the maximum monetary losses likely to be incurred by government and third party personnel and property in the event of a mishap. It is calculated by assessing the dollar value of government and third party properties at risk by launch accidents likely to occur as the result of the conduct of launch activities.

the amount specified (the most common method).

The final element in the licensing process is the environmental evaluation. It ensures that proposed launch activities undergo an environmental review as required by the National Environmental Policy Act (NEPA). In order to be granted a license, the applicant must provide information sufficient to enable AST to comply with the requirements of NEPA.

AST has the authority to monitor the activities of a licensee to determine if the licensee is in compliance with FAA regulations and the terms of the license. Under the law, access shall be granted to individuals authorized by AST to observe any activities of the licensee, or of the licensee's contractors or subcontractors, associated with the licensed launch.

If a licensee has substantially failed to comply with the relevant laws, regulations, or terms of its license, the license can be suspended or revoked. Depending on the infraction, the licensee may also be subject to a civil penalty.

## LICENSE RENEWAL

Licenses may be renewed by an application made at least 90 days before the expiration of the license. Renewal is subject to the same requirements as the original license and may be denied if the renewal application is inadequate or if requested modifications to the launch license are unacceptable.

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**Table 2. Elements in the Launch Licensing Process**

Pre-Application Consultation	This process allows a prospective applicant to familiarize AST with its proposal and likewise be familiarized with the details of the licensing process.
Policy Review	The Policy Review entails reviewing an application for issues affecting U.S. national security, foreign policy interests, or international obligations.
Safety Evaluation	The purpose of the Safety Evaluation is to determine whether an applicant can safely launch vehicle(s) and payload(s).
Payload Review	The payload is reviewed by AST to determine whether its launch would jeopardize public health and safety, U.S. national security or foreign policy interests, or international obligations of the United States.
Financial Responsibility Determination	All licensees must demonstrate the financial ability to make compensation for the maximum probable loss from claims.
Environmental Review	AST must consider the environmental effects of a commercial space launch.

## COMMERCIAL LAUNCH SITE LICENSING

An application for a license to operate a launch site is conducted in much the same way as an application for a launch vehicle license. As with a launch license, a site license requires the licensee to demonstrate that the site does not pose a threat to public health and safety, private property, United States national security or foreign policy interests, and will not violate the United States' international obligations. The applicant must demonstrate that it is possible to launch at least one vehicle type on at least one launch trajectory. However, AST does not conduct a financial responsibility determination for launch sites as it does for launch activities because this provision is not contained in the *Commercial Space Launch Act*.

A launch site operator is required to provide such environmental information as AST deems necessary to allow it to comply with NEPA. As with a vehicle license, it is necessary that a site operator diligently follow the terms of the site license in order to remain in compliance with AST rules and regulations.

## STATUS OF LICENSING ACTIVITY

AST has issued launch operator's licenses for commercial launches of orbital launch vehicles such as the Atlas, Delta, Taurus, Zenit, and Athena launch vehicles, and the air-launched Pegasus vehicle. AST has also issued licenses for commercial launches of suborbital sounding rockets such as the Starfire. The first licensed launch was a suborbital launch of a Starfire on March 29, 1989. The 100th licensed launch was that of a Delta 2 from Vandenberg Air Force Base in California on September 8, 1998. AST has also licensed the conduct of launches from the Pacific Ocean (see Table 3).

While the vast majority of licensed launch activities occur from U.S. Federal Ranges - such as the Cape Canaveral Air Station, Florida, Vandenberg Air Force Base, California, White Sands Missile Range, New Mexico, and Wallops Flight Facility, Wallops Island, Virginia - many future launch activities are expected to occur from private or State-operated launch sites. AST has licensed the operation of several non-Federal launch sites including the California Spaceport at Vandenberg Air Force Base, Spaceport Florida at Cape

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Canaveral Air Station, the Virginia Space Flight Center at Wallops Island, and Spaceport Alaska at Kodiak Island, Alaska (see Table 4). The first launch from a non-Federal range licensed by AST was that of

NASA's Lunar Prospector aboard a Lockheed Martin Athena-2 rocket on January 6, 1998, from Spaceport Florida.

**Table 3. Active AST Launch Licenses**

License	Company	Vehicles	Location	Original Effective Date	Most Recent Renewal Date	Expiration Date
LLO 91-023	MDC	Delta 2,3	CCAS	1 May 1991	13 Apr 1999	1 May 2001
LLO 95-033	LMC	Atlas 1, 2, 2A, 2AS, 3A, 3B	CCAS	20 Feb 1998	12 Feb 1999	20 Feb 2001
LLO 97-041	OSC	Pegasus	CCAS	18 Mar 1997	11 Mar 1999	18 Mar 2001
LLO 99-046	OSC	Pegasus	KMR	23 Jul 1999		23 Jul 2004
LLS 99-045	SLLP	Zenit-3SL	Pacific Ocean	9 Mar 1999		3 Dec 1999
LLS 99-047	SLLP	Zenit-3SL	Pacific Ocean	24 Sep 1999		30 Apr 2000
LLO 94-031	OSC	Pegasus	VAFB	2 Sep 1994	2 Sep 1998	2 Sep 2000
LLO 96-034	MDC	Delta 2	VAFB	2 Jan 1996	24 Dec 1997	2 Jan 2000
LLO 96-037	OSC	Taurus	VAFB	13 Mar 1996	6 Mar 1998	13 Mar 2000
LLO 97-044	LMC	Athena 1, 2	VAFB	12 Sep 1997		31 Dec 1999
LLO 97-040	OSC	Pegasus	WFF	18 Mar 1997	11 Mar 1999	18 Mar 2001

**Table 4. Launch Site Operator Licenses Issued**

License	Operator / Launch Site	Location	Original Effective Date	Most Recent Renewal Date	Expiration Date
LSO 96-001	Spaceport Systems International / California Spaceport	VAFB	19 Sep 1996		19 Sep 2001
LSO 97-002	Spaceport Florida Flight Authority / Spaceport Florida	CCAS	22 May 1997		22 May 2002
LSO 97-003	VA Commercial Space Flight Authority / Virginia Space Flight Center	WFF	19 Dec 1997		19 Dec 2002
LSO 97-004	Alaska Aerospace Development Corporation / Kodiak Island	KLC	24 Sep 1998		24 Sep 2003