



**FAA**  
Commercial Space  
Transportation

# Federal Aviation Administration Commercial Space Transportation



Photo Credit: William G. Hartenstein

## A Review of Environmental Requirements and Planning

February 2006

# Background

In 1984, under the direction of the Commercial Space Launch Act (CSLA), the Department of Transportation was designated the lead agency for regulating United States (U.S.) commercial launch activities. Under the CSLA, the FAA's Office of Commercial Space Transportation (AST) is responsible for:

- (1) Licensing and regulating all U.S. commercial launch activities to ensure that they are conducted safely and responsibly, and
- (2) Promoting, encouraging, and facilitating the growth of the U.S. commercial space transportation industry.

In December 2004, the Commercial Space Launch Amendments Act (CSLAA) was enacted to promote the emerging industry of reusable launch vehicles for private human space travel. The CSLAA directs the FAA to regulate human spaceflight and establish a regime for developmental reusable suborbital rockets.

Until the FAA issues regulations promulgating requirements for launch operators to obtain and maintain an experimental permit, the FAA will issue experimental permits on a case-by-case basis. The *Guidelines for Experimental Permits for Reusable Suborbital Rockets*, published in May 2005, address safety and other issues for the interim period before regulations are finalized. See [http://ast.faa.gov/files/pdf/EP\\_Guidelines\\_ver1.pdf](http://ast.faa.gov/files/pdf/EP_Guidelines_ver1.pdf) for a copy of these guidelines.

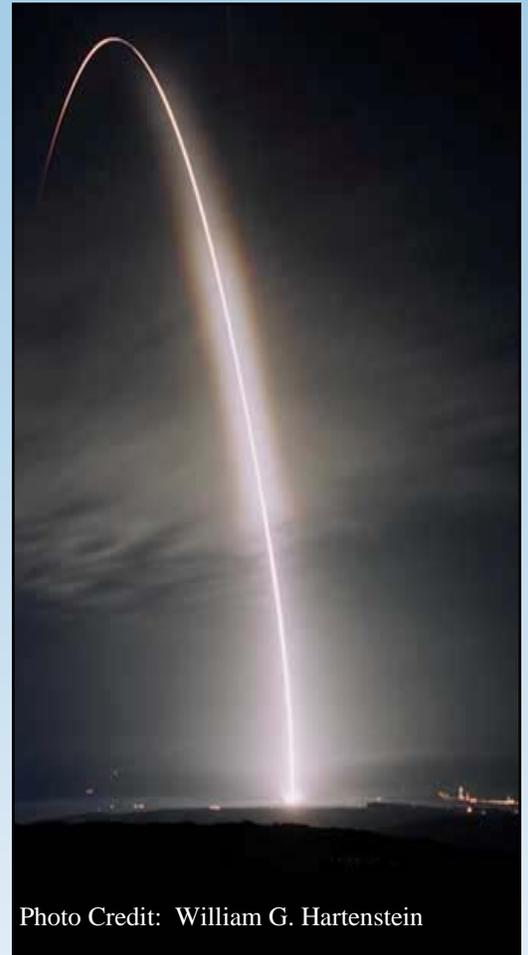


Photo Credit: William G. Hartenstein

*Atlas Launch*



Photo Credit: William G. Hartenstein

*Atlas V: Launched in 2005*

An important component of AST's established duties is to protect, restore, and enhance the environment by evaluating the environmental impacts associated with Federal actions under the National Environmental Policy Act (NEPA) of 1969. Environmental Impact Statements (EISs) and Environmental Assessments (EAs) are prepared by AST in accordance with NEPA to consider the environmental consequences of commercial space launch activities.

In an effort to balance AST's responsibility to protect the environment while meeting its mission to promote the industry, this brochure focuses on AST's efforts in streamlining the environmental review process for applicants.

# AST Accomplishments

**Programmatic Environmental Impact Statement (PEIS)** - The *Final Programmatic Environmental Impact Statement for Horizontal Launch and Reentry of Reentry Vehicles* evaluated the potential programmatic environmental effects of licensing horizontal launches of Launch Vehicles (LVs), reentries of Reentry Vehicles (RVs), and the operation of facilities that support these activities both in the U.S. and abroad. (See below left, a depiction of a horizontal LV). The PEIS allows applicants to tier subsequent environmental analyses for specific launches, reentries, and/or the operations of launch or reentry sites. The Notice of Availability (NOA) of the Draft PEIS appeared in the *Federal Register* on July 29, 2005 (70 FR 43931), followed by the Final PEIS NOA on December 23, 2005 (70 FR 76282). The record of decision will be issued in February 2006. These documents are available on AST's website: [http://ast.faa.gov/lrra/comp\\_coop.htm](http://ast.faa.gov/lrra/comp_coop.htm).



*SpaceShipOne*

**SpaceX Finding of No Significant Impact (FONSI)** - On November 1, 2005, AST published a FONSI in the *Federal Register* (70 FR 65961) for a launch license application submitted by Space Exploration Technologies, Inc. (SpaceX). AST found that the proposed launches of Falcon LVs from U.S. Army Kwajalein Atoll/Ronald Reagan Ballistic Missile Defense Test Site on Omelek Island (see below) would have no significant environmental impacts, and would be consistent with existing national environmental policies and objectives set forth in Section 101(a) of NEPA.



Photo Credit: <http://www.okspaceporteis.com>

*Clinton-Sherman Industrial Airpark:  
Oklahoma Spaceport EA*



Photo Credit: <http://spacex.com/>

*Falcon 1 with C17, Omelek Island: Space X FONSI*

**EA for the Oklahoma Spaceport** - AST's Draft Oklahoma Spaceport EA was released in January 2006. The analysis in the EA will serve as a basis for future launch licensing decisions at the Clinton-Sherman Industrial Airpark (CSIA) (see left). The document analyzed the environmental impacts of the launches of three different types of LVs from the CSIA, which is near Burns Flat, Oklahoma. The EA finding will support the decision to license the Oklahoma Space Industry Development Authority as a launch site operator at the CSIA.

# AST Accomplishments

License renewals for Pegasus and Taurus Launches at Vandenberg Air Force Base - These Orbital Sciences Corporation (OSC) licenses have been renewed on several occasions and were scheduled to expire in 2005. As part of OSC's renewal application, AST reviewed the relevant environmental analyses and prepared Written Reevaluations that supported the license renewal effort for Pegasus and Taurus launches (*see right*) from Vandenberg Air Force Base.

Photo Credit: <http://www.spaceflightnow.com>



*Taurus LV Launch—License Renewal*



*Space X Falcon I at Vandenberg Air Force Base*

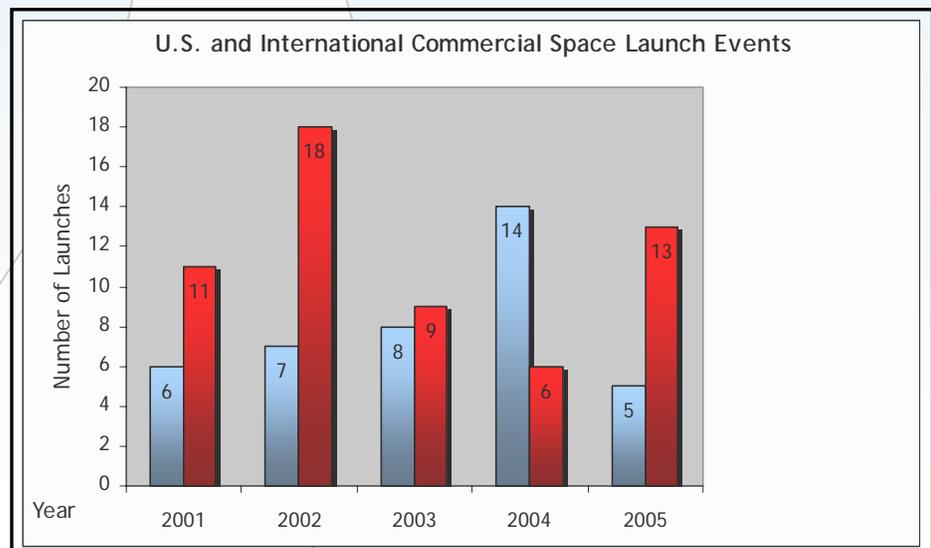
**Licensing and Launches** - AST considers all potential environmental impacts associated with proposed commercial launch and reentry activities in the decision making process. No commercial launch or reentry activities are licensed or permitted until the environmental review is completed. In 2005, five FAA-licensed commercial launches were conducted:

- Four launches by Sea Launch from an equatorial platform in the Pacific Ocean and
- One Atlas V launch from Cape Canaveral Air Force Station in Florida.

The graph to the right compares U.S. commercial (FAA-licensed orbital launches) with international commercial launches (internationally competed launch services).

**Cooperating Agencies** - In 2005, FAA was a cooperating agency on two EAs:

1. U.S. Air Force Orbital Sub-orbital Program EA was released in October 2005 and analyzed the impacts of developing a new family of launch vehicles that use surplus Minuteman II and Peacekeeper Inter Continental Ballistic Missile rocket motors to launch small and micro satellites into Low Earth Orbit, and conduct sub-orbital-trajectory missions.
2. U.S. Army Supplemental EA analyzing launches of the Space X Falcon I vehicle (*shown left*) from Vandenberg Air Force Base was released in September 2005.



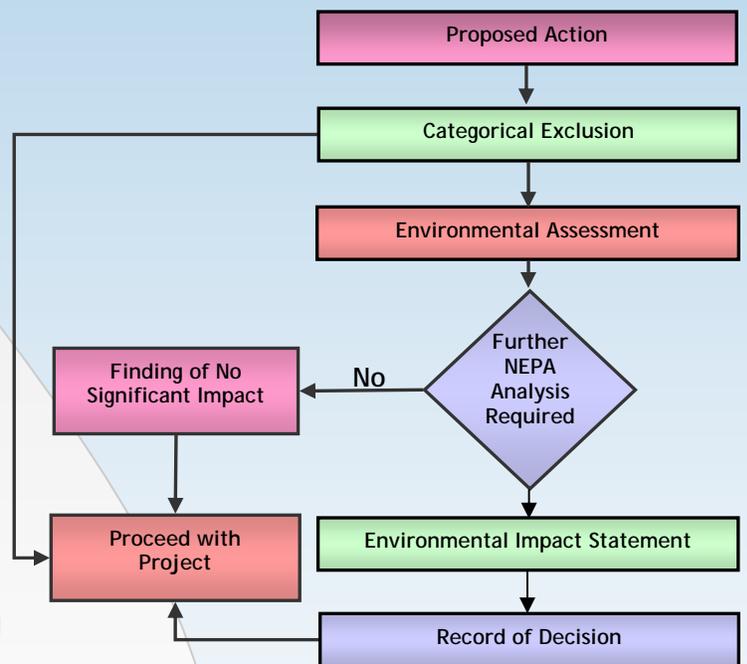
# Streamlining AST's Environmental Review Process

**AST NEPA Obligations** - Licensing of launch and reentry activities is considered a major Federal action. Consequently, NEPA requires that AST analyze the environmental impacts associated with proposed commercial launch activities. Before a license is issued by AST, the environmental review component of the licensing process must be satisfied. This is accomplished through the preparation of an environmental determination, which becomes a part of the license.

**CEQ's Stance on Streamlining** – The Council on Environmental Quality (CEQ) established a NEPA Task Force to review the current NEPA implementing practices and procedures. The Task Force is intended to modernize the implementation of NEPA to make the process more effective, efficient, and timely. The Task Force reviewed issues such as level of detail, structure of documents, and other practices related to the process. In September 2003, the Task Force issued a report to CEQ called *Modernizing NEPA Implementation*. The CEQ developed implementing recommendations based on the Task Force's report, and on May 2, 2005, they issued a memorandum to all Federal agencies outlining these recommendations. For more information visit <http://ceq.eh.doe.gov/ntf/>

FAA Order 1050.1E provides FAA with policies and procedures to ensure compliance with the requirements set forth in the CEQ regulations for implementing the provisions of NEPA and related Federal and Department of Transportation regulations. The Order provides guidance and procedures for preparing documents.

## NEPA Analysis Diagram



## How Streamlining Helps AST Applicants

Streamlining involves making the environmental review process quicker, simpler, and more efficient. Two ways that AST can help its applicants include the following:

1. **Creating documents from which applicants can tier future environmental analyses.**  
The *Horizontal Launch and Reentry of Reentry Vehicles PEIS* allows AST applicants to tier subsequent environmental analyses for specific launches, reentries, and/or the operation of launch or reentry sites. Tiering saves time because an applicant need only summarize the issues discussed in the PEIS, and incorporate discussions from the PEIS by reference on the issues specific to the applicant's proposed action.
2. **Creating documents that applicants can incorporate by reference or use for a basis of analysis.**  
See page 5 of this brochure for more information about the technical studies that AST is developing for this purpose.

# Streamlining AST's Environmental Review Process

## TECHNICAL STUDIES

AST is drafting three technical studies that are intended to assist applicants in meeting their environmental requirements. Applicants can reference the studies in their NEPA documents, or use them to facilitate further analysis conducted by the applicants.

**Air Quality Technical Study - *Consideration of Air Quality Impacts by Launch Vehicle Operations at or Above 3,000 Feet Above Ground Level.*** This technical report will demonstrate that LV operations at or above 3,000 feet above ground level do not impact local, ground-level air quality, even with worst-case assumptions. However, other impacts above 3,000 feet, such as global warming or ozone depletion, could result from LV operations above 3,000 feet. Therefore, any other impacts that might occur above 3,000 feet must still be analyzed in the appropriate environmental documentation. When this report is available, an applicant can reference this document when explaining there are no ground impacts from emissions that occur above 3,000 feet.

**Sonic Boom Technical Study - *Sonic Boom Prediction Tool Technical Study.*** AST is developing a Sonic Boom Prediction Tool to estimate sonic booms created by launch vehicles. In the future, an applicant may be able to provide the appropriate data to AST for analysis to calculate the following: overpressure in pounds per square foot; duration in seconds; and a C-weighted day-night average sound level value. The applicant could then include this information in their environmental documentation.

**Wildlife Technical Study - *Hazards Associated with Wildlife Proximity to Commercial Space Transportation Launches and Landings.*** This study identifies the potential hazards to and from birds and large mammals and recommends general launch and reentry facility siting guidelines to reduce the potential of damage from bird or large mammal strikes. This paper will provide a foundation for developing guidance or fact sheets to assist applicants.

## ENVIRONMENTAL MANAGEMENT SYSTEM

An Environmental Management System (EMS) is a proactive, systematic approach for managing the potential environmental consequences of an organization's actions. On November 18, 2005, AST completed a successful self-declaration audit of its EMS. On December 8, 2005, AST declared its conformance with EMS per Executive Order 13148, "Greening the Government through Leadership in Environmental Management" (2000), which required that all Federal agencies implement an EMS by the end of 2005.

AST's goal is for EMS to facilitate environmental streamlining for its applicants. Therefore, AST set a number of EMS targets that relate to environmental streamlining. The targets that relate to streamlining, and that are discussed in more detail throughout this brochure, are as described below.

EMS Target	Fiscal Year of Completion
Develop Air Quality Technical Study	2006
Develop sonic boom prediction tool	2006
Develop wildlife strike report	2006
Update the FAA Order 1050.1E environmental guidelines document	2007

# Ongoing and Future Activities

**Southwest Regional Spaceport (SRS) EIS** - In the January 24th (71 FR 3915) edition of the *Federal Register*, in coordination with the Bureau of Land Management, the FAA published a Notice of Intent to prepare an EIS for the proposed spaceport. The proposed action is for AST to issue a launch site operator license to the New Mexico Economic Development Department (NMEDD) that would permit the operation of a facility supporting both horizontal and vertical suborbital launches with subsequent return to land within and around the proposed area of the SRS (*see right*). The launch site operator license does not permit the NMEDD to conduct launches, only to offer the facility and infrastructure to launch operators. All individual launch operators would be subject to separate AST licensing or permitting. Scoping meetings will be conducted on February 15 and 16 in New Mexico to solicit environmental input from the public.



*Proposed site of the Southwest Regional Spaceport*

**Revising Guidelines for FAA Order 1050.1E** — AST is revising its guidelines for FAA Order 1050.1E, *Guidelines for Compliance with NEPA and Related Environmental Review Statutes for the Licensing of Commercial Launches and Launch Sites* (February 22, 2001). The current guidelines document is based on FAA Order 1050.1D, which was revised and replaced by 1050.1E.

**Blue Origin EA** - Blue Origin, LLC has proposed to construct and operate facilities that will support preflight processing, flight, and landing and recovery activities in Culberson County, Texas. Proposed construction includes a vehicle processing facility, a launch pad complex, a vehicle landing and recovery area, and a space flight participant training facility.

**X PRIZE CUP** - AST will prepare environmental reviews for applicants seeking an experimental permit or launch license for the X PRIZE CUP. The X PRIZE events for 2006 are scheduled for October 16 to 22. The goal of the X PRIZE is to stimulate breakthroughs in technology using a competitive model similar to the Orteig Prize, won by Charles Lindbergh in 1927 for being the first to fly non-stop from New York to Paris.



*Photograph of October 2005 X PRIZE event*

Beginning in 2006, and previewed in 2005, an annual X PRIZE CUP and Personal Spaceflight Expo will take place in New Mexico. The event will stimulate and promote the development of the next generation of reusable launch vehicles. The X PRIZE Foundation is supported by generous private contributions.

See left a photo of the 2005 X PRIZE event held October 4-9 in New Mexico.

The image features the official seal of the Federal Aviation Administration (FAA) in the background. The seal is circular with a gold border and contains a globe with a compass rose. The words "FEDERAL AVIATION" are written along the top arc and "ADMINISTRATION" along the bottom arc, with two stars on either side. Overlaid on the seal is contact information for Doug Graham and Stacey Zee.

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**Visit AST's website at <http://ast.faa.gov>**