Record of Decision

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DEPARTMENT OF TRANSPORTATION
Federal Aviation Administration

Record of Decision

AGENCY: Federal Aviation Administration (FAA), Office of Commercial Space Transportation.
ACTION: Record of Decision.

SUMMARY: The Record of Decision was prepared based on the Final Programmatic Environmental Impact Statement (PEIS) for Horizontal Launch and Reentry of Reentry Vehicles. The FAA prepared this Record of Decision pursuant to the National Environmental Policy Act (NEPA) of 1969 as amended (42 United States Code 4321, et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 Code of Federal Regulations [CFR] 1500-1508), and FAA Order 1050.1 E, Environmental Impacts: Policies and Procedures. This Record of Decision contains the statement of decision, identifies the alternatives considered, and discusses the factors on which the decision was based.

The PEIS considered the potential programmatic environmental effects of licensing horizontal launches of launch vehicles, reentries of reentry vehicles,\1\ as well as licensing the operation of facilities that support these activities. The PEIS considered three horizontal launch vehicle concepts and reentry vehicles with both powered and unpowered landings.

\1\ Reentry vehicle means a vehicle designed to return from Earth orbit or outer space to Earth. In the PEIS, reentry vehicles consisted of vehicles launched into orbit via vertical and horizontal launch vehicles.

As the designated authority for regulating the U.S. commercial space transportation industry and issuing licenses for launches, reentries, and the operation of launch sites, the FAA was the lead agency preparing the PEIS. No other agency was designated or requested to act as a cooperating agency for the development of the PEIS. After considering the environmental impacts, public comments, and programmatic factors, the FAA has decided to implement the preferred alternative.

FOR FURTHER INFORMATION CONTACT: For further information on the PEIS or this Record of Decision, please contact Ms. Stacey Zee, FAA Environmental Specialist at (202) 267-9305 or e-mail Stacey.Zee@faa.gov. Downloadable electronic versions of the Final PEIS and Record of Decision are available on the FAA PEIS Web site http://ast.faa.gov/lrra/comp_coop.htm EXIT Disclaimer .

SUPPLEMENTARY INFORMATION:

Introduction

This Record of Decision provides final FAA approval for a program to license three horizontal launch vehicle concepts, reentries of reentry vehicles with both powered and unpowered landings, and the operation of facilities that support these activities. The FAA is considering the impacts of licensing all launch and reentry vehicle concepts analyzed under the proposed action to maintain the greatest flexibility for the development and growth of the U.S. commercial space industry. Licenses for the operation of individual launch and reentry vehicles or individual launch sites would be considered on a case-by-case basis. Any additional site-specific environmental documentation would be

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developed as needed prior to FAA approval of specific licensing activities. The FAA has concluded that there are no significant short-term or long-term effects to the human environment resulting from this licensing program. The proposed Federal action is consistent with the purpose of national environmental policies and objectives as set forth in NEPA and will not significantly affect the quality of the human environment.

Background

Under 49 U.S.C. Subtitle IX, Chapter 701, Commercial Space Launch Activities (formerly the Commercial Space Launch Act), the Department of Transportation, and through delegations, the FAA, has the authority to license and regulate all United States (U.S.) commercial launch activities to protect public health and safety, safety of property, and the national security and foreign policy interests of the U.S. The FAA also has the responsibility to promote, encourage, and facilitate the growth of the U.S. commercial space transportation industry and infrastructure. In fulfilling its responsibilities since 1989, the FAA has licensed more than 100 launches and has issued licenses for the

operation of several launch sites.

In the past few years, the commercial space industry has expressed heightened interest in commercial development of space, including launch vehicles that are launched horizontally and the reentry of reentry vehicles. As identified in Commercial Space Launch Activities (49 U.S.C., Subtitle IX, Chapter 701), the development of such vehicles and associated services by the commercial space transportation industry is in the national and economic interest of the U.S. The purpose of the proposed action as described in the PEIS is to facilitate the issuance of licenses for horizontal vehicle launches, reentry of reentry vehicles, and the operation of facilities where such actions would occur. By facilitating the issuance of licenses, the FAA would assist the space launch industry in meeting the demand for services (e.g., demand for delivering satellites to orbit) and expanding into new markets (e.g., space tourism). The need for the action proposed by the FAA is to promote the growth of the U.S. commercial space transportation industry while protecting public health and safety, the safety of property, and ensuring that the launch services provided by private U.S. enterprises are consistent with national security and foreign policy interests of the U.S.

The FAA prepared the PEIS to evaluate the potential environmental impacts of licensing horizontal launches, reentries, and the operation of facilities associated with those activities. A PEIS is appropriate for projects that are broad in scope and are widely dispersed geographically. It creates a framework that supports subsequent analysis of specific activities at specific locations, which can be tiered from the PEIS. The PEIS for Horizontal Launch and Reentry of Reentry Vehicles is intended to serve as a tiering document for subsequent site-specific NEPA analyses. It includes a guide that identifies how a specific resource area should be analyzed and includes thresholds for considering the significance of environmental impacts to specific resource areas.

The PEIS considers the programmatic environmental impacts of the proposed action and its alternatives, including the no action alternative. The activities considered in the PEIS could occur at any location that falls under the licensing authority of the FAA or Federal launch and reentry facilities. The PEIS is intended to update and replace the 1992 Final PEIS for Commercial Reentry Vehicles and to complement the 2001 PEIS for Licensing Launches.

The information in the PEIS is not intended to address all site-specific launch and reentry issues, such as localized effects. Any additional site-specific environmental documentation will be developed as needed prior to FAA approval of proposed licensing activities.

Public Involvement

The Notice of Intent to prepare the PEIS for Horizontal Launch and the Reentry of Reentry Vehicles was published in the Federal Register (68 FR 50210) on August 20, 2003. On October 16, 2003, the FAA published a notice of extension in the Federal Register (68 FR 59676), which extended the scoping period from September 26, 2003 to October 31, 2003. The Notice of Availability for the Draft PEIS was published by the Environmental Protection Agency (EPA) in the Federal Register (70 FR 43867) on July 29, 2005. All public comments received during the

45-day public comment period were considered in developing the Final PEIS. EPA published the Notice of Availability for the Final PEIS in the Federal Register (70 FR 76282) on December 23, 2005.

Proposed Agency Action and Alternatives Considered

The preferred alternative for the PEIS is the proposed action. Under the proposed action, the FAA would license horizontal vehicle launches, reentries of reentry vehicles, and the operation of facilities that would support these operations. The activities associated with horizontal vehicle launches and reentry of reentry vehicles with powered and unpowered landings, are presented separately in the PEIS, and the impact analysis in the PEIS discusses the potential impacts considering the activities both as individual events and as part of a single mission. Some horizontal launch vehicles would be launched into suborbital trajectories and would not reach orbit. Rather the vehicles would reach apogee (i.e., the highest point in the vehicle's flight) and would return to land at a designated location. The return and subsequent landing of these vehicles would not require reentry licenses.

In contrast, some horizontal launch vehicles would be launched into orbital trajectories and would reach Earth orbit. After reentry, these vehicles would land at designated locations. Others would be transported into orbit via vertical launch vehicles, as considered previously in the FAA's 2001 PEIS for Licensing Launches. Reentry of these vehicles would require reentry licenses.

The FAA estimated that there would be 1,279 U.S. commercial horizontal vehicle launches between 2005 and 2015. Of these, 97 percent (1,242) are expected to use suborbital trajectories. The remaining three percent (37) of U.S. commercial horizontal launches are expected to reach orbit. Note that the horizontal launches considered in the analysis include launches of both reusable and expendable vehicles; however, very few expendable launches were included in the analysis. In addition, 14 U.S. commercial vertical launches of reentry vehicles are expected to reach orbit; therefore, there would be a total of 51 U.S. commercial reentries of reentry vehicles from 2005 through 2015. These estimates, along with the pre- and post-flight activities associated with launch and reentry, provide the basis for the description of the proposed action and the analysis of environmental impacts.

The PEIS considered three horizontal launch vehicle concepts, including existing and conceptual designs. These launch vehicles would typically range from 9 to 21 meters (30 to 70 feet) in length and weigh 1,300 to 4,500 kilograms (2,866 to 9,921 pounds)

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unfueled. The launch vehicle concepts would use the following design configurations to meet operational goals.

? Concept 1 vehicles--These vehicles use jet-powered takeoff with subsequent rocket engine ignition when the vehicles reach a pre-determined altitude and powered horizontal landings.

? Concept 2 vehicles--These vehicles use rocket powered takeoff and flight and non-powered horizontal landings.

? Concept 3 vehicles--These vehicles are carried aloft via

assist aircraft with subsequent rocket engine ignition and non-powered horizontal landings.

The PEIS also considered reentry vehicles with both unpowered and powered landings. These vehicles would range from 9 to 46 meters (30 to 150 feet) in length and weigh 1,300 to 10,000 kilometers (2,866 to 22,046 pounds) unfueled.

The following four alternatives were considered in the PEIS in addition to the preferred alternative:

Alternative 1: Alternative 1 considered licensing only launches of orbital launch vehicles for which reentry with unpowered landing is planned. For the purpose of this alternative, the FAA assumed that all licensed reentries would have unpowered landings (51 reentries from 2005 to 2015). The remaining activities would be the same as presented in the proposed action.

Alternative 2: Alternative 2 considered licensing only launches of orbital launch vehicles for which reentry with powered landing is planned. For the purpose of this alternative, the FAA assumed that all licensed reentries would have powered landings (51 reentries from 2005 to 2015). The remaining activities would be the same as presented in the proposed action.

Alternative 3: Under alternative 3, the FAA would license horizontal launches which do not produce rocket emissions below 914 meters (3,000 feet), for a total of 713 launches from 2005 to 2015. For this alternative, FAA considered 25 jet-powered landings and 26 rocket-powered landings. Under this alternative, all Concept 2 vehicles presented in the proposed action would not be licensed, and the remaining activities would be the same as presented in the proposed action

No Action Alternative: Under the no action alternative, the FAA would not issue licenses for the horizontal launch of launch vehicles, reentry of reentry vehicles, or the operation of launch facilities for such activities; therefore, all U.S. licensed launches would be vertical launches as described in the FAA's 2001 PEIS for Licensing Launches.

Environmental Impacts of the Proposed Action and Alternatives

The activities associated with horizontal vehicle launches and reentries of reentry vehicles were presented separately in the PEIS. The environmental impacts analysis was based on the following activities associated with the horizontal launch of an launch vehicle:

- Launch facility preparation,
- Preparation of the launch vehicle,
- Pre-flight ground operations,
- Horizontal takeoff, flight, and/or launch, and
- Deployment of payload (if applicable) and/or attainment of intended altitude.

The PEIS also assessed the impacts of the following activities associated with the reentry of a reentry vehicle:

- Establishment of a reentry trajectory from Earth orbit or outer space,
- Reentry into the Earth's atmosphere,
- Powered or unpowered landing, and
- Recovery of the reentry vehicle from the surface of the Earth.

The baseline conditions of each of the 13 environmental resource areas, as well as the regulatory setting and standards, were defined

and described to provide the basis for the evaluation and comparison of impacts. The FAA used various environmental criteria to determine the overall environmental impact of the proposed action and alternatives. Although the significance of most environmental consequences will need to be determined in site-specific NEPA analyses that tier from the PEIS, three resource areas may be affected on a programmatic level, these include: Atmosphere, orbital debris, and socioeconomics. The PEIS analyzes impacts on the atmosphere including ambient air quality, acid rain, ozone depletion, and global warming. Impacts related to orbital debris include de-orbiting material as well as collisions in space with other man-made objects. Impacts associated with socioeconomics include the effects on the commercial launch industry and the national economy with respect to the global market; however, local socioeconomic impacts associated with developing a launch or reentry facility would be addressed in a site-specific NEPA analysis.

The FAA also considered applicable Executive Orders, regulations, and laws in its determination of the overall environmental impact of the proposed action and alternatives. Executive Order 12898 requires Federal agencies to identify and address disproportionately high and adverse human health or environmental effects of Federal programs, policies, and activities on minority and low-income populations. Activities under the proposed action or alternatives that would result in adverse environmental effects would be reviewed for their effects on minority communities and low-income populations in a site-specific NEPA document that would tier from the PEIS. Consultations and permits are required from the appropriate regulatory agencies under the Endangered Species Act, section 7; National Historic Preservation Act, section 106; Farmland Protection Policy Act; Department of Transportation (DOT) Act, section 4(f); Clean Water Act; and various sections under 14 CFR. Environmental impacts identified as a result of the consultation and permitting processes would be evaluated in a site-specific NEPA analysis that tiers from the PEIS.

According to the impacts analysis contained in Chapter 4 of the PEIS, negligible impacts are expected for all resource areas except socioeconomics. By adhering to the FAA licensing and review process, impacts on airspace and public health and safety would not be significant. Because this is a programmatic review, site-specific NEPA analysis would be required to evaluate the impacts on or associated with noise, vegetation, wildlife, threatened or endangered species, local socioeconomics, environmental justice, and hazardous waste. The FAA found that the impacts on the atmosphere, orbital debris, geology and soils, fresh water or marine systems, wetlands, floodplains, ground water, aesthetics and visual resources, section 4(f) resources, land use, or cultural resources would not be significant; however, these determinations may depend on site-specific characteristics as well. The licensing of a launch or reentry site involving new construction or modification of existing infrastructure would require evaluation in a site-specific NEPA analysis. The socioeconomic impacts under each alternative are summarized in the following sections:

Proposed Action/Preferred Alternative: Moderate impacts to socioeconomics are anticipated from the proposed action. Licensing activities associated with the proposed action may result in an increase in the employment of skilled and professional workers, and therefore, would have an economically beneficial impact. Jobs associated

with the commercial launch industry are generally technology-based

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and require employees with specialized skills and higher levels of education. The creation of jobs in the commercial launch industry would have secondary economic effects on local communities due to the increased personal income and the associated tax base. Furthermore, the new or additional workers may increase the size of the surrounding community and may create a need for more local services, which in turn creates additional jobs within that community.

The licensing of a particular horizontal launch vehicle or reentry vehicle mission could result in a temporary increase in the local work force at a particular launch or reentry facility, and would be considered a negligible impact on the local economy. The development of a new or modification of an existing launch or reentry site would result in temporary local employment during construction, and new permanent employment during operation. The relative impact on the local socioeconomic setting depends on the conditions (e.g., size of the local economy and capacity of the local services). Such impacts, and whether or not they would be considered a significant impact, would be analyzed in site-specific NEPA documents that would tier from the PEIS.

Implementation of the proposed action would have a negligible impact on the national economy; however, it would have a beneficially significant impact on the commercial launch industry. The proposed action would allow US-based companies to remain competitive in the global aerospace industry and its expanding commercial space applications.

Alternative 1: Moderate impacts to socioeconomics are anticipated for alternative 1 because this alternative would limit the development of commercial reentry vehicles to only those with unpowered landing. Licensing only a subset of the reentry vehicle activities outlined in the proposed action could reduce the magnitude of this impact and could limit the development and growth of the commercial launch industry.

Alternative 2: Moderate impacts to socioeconomics are anticipated for alternative 2 because alternative 2 would limit the development of commercial reentry vehicles to those that use unpowered landing. Licensing only a subset of the reentry vehicle activities outlined in the proposed action could reduce the magnitude of this impact and could limit the development and growth of the commercial launch industry.

Alternative 3: Moderate impacts to socioeconomics are anticipated for alternative 3 because alternative 3 would limit the development of commercial launch vehicles to Concepts 1 and 3. Licensing only a subset of the launch vehicle concepts outlined in the proposed action could reduce the magnitude of this impact and could limit the development and growth of the commercial launch industry.

No Action Alternative: Moderate impacts to socioeconomics are anticipated for the no action alternative. Under the no action alternative, the FAA would not issue licenses for the horizontal launch of launch vehicles and reentry of reentry vehicles, or for the operation of facilities for such activities; therefore, all U.S. licensed launches would be vertical launches as described in the FAA's 2001 PEIS for Licensing Launches.

Not licensing the activities described under the proposed action may result in an impact on the socioeconomics of a local community

where one of the major employers is the commercial horizontal launch industry. If the FAA did not issue licenses for horizontally launched launch vehicles, reentry of reentry vehicles, or for facilities that would support such activities, industries seeking to provide such services would not be able to function in the U.S. market and would be forced to find other products, services or avenues to maintain economic viability. Such impacts on a local community may result in substantial decreases in the local tax base, which could adversely affect the socioeconomic setting. These issues would need to be addressed in site-specific analyses that would tier from the PEIS. In addition, the U.S. horizontal commercial launch industry would not be able to expand and remain competitive in the global horizontal launch and reentry markets. Foreign markets would continue to grow their market share and develop technology, while the U.S. would lag behind in this market sector, both economically and technologically.

No significant environmental impacts or cumulative impacts on resource areas addressed for any activity considered were found in the programmatic impact analysis. There could be impacts associated with the specific licensing activities at specific locations; however, as stated in the PEIS they would be addressed in a subsequent review that would tier from the PEIS. As appropriate, mitigation measures would be developed to address any site-specific significant impacts.

Mitigation Measures

In developing mitigation measures for the activities considered in the PEIS, the FAA reviewed its licensing procedures to identify operational controls or methods that could be implemented as mitigation measures. The FAA would continue to develop and implement environmental monitoring programs on a case-by-case basis, as appropriate. Specifically, the FAA would consider developing monitoring programs to ensure that licensees meet requirements of various regulations including the Endangered Species Act, Marine Mammal Protection Act, and National Historic Preservation Act. These monitoring requirements may be listed as part of the terms and conditions of future licenses.

In addition to the development of monitoring programs, the FAA would continue to prepare a variety of reports that would serve to maintain accountability of both commercial and noncommercial launch activities, track successful and failed launches, maintain current safety standards, and remain abreast of future launch activities and concepts. The FAA would also continue to make this information available for the public via its Internet site (http://ast.faa.gov/rep_stu EXIT Disclaimer). As the commercial space industry grows and expands into new areas or surpasses the level of activity or technologies analyzed in current NEPA documents prepared by the FAA, this process would allow the FAA to proactively identify new concepts or increased levels of activities that would require review in accordance with NEPA.

Environmentally Preferred Alternative

The environmentally preferred alternative is the no action alternative. However, except for alternative 2, implementation of the proposed action would result in only slightly greater environmental impacts than the overall impacts associated with the alternatives and

no action alternative. Under alternative 2, it was assumed that all reentries would have powered landings; therefore, the environmental impacts of implementing alternative 2 would be slightly greater than those associated with the proposed action. However, all impacts associated with the proposed action and alternatives were found to be negligible. In terms of socioeconomics, the proposed action would result in the greatest beneficial impact, as it would not restrict the innovation and development of the U.S. commercial space industry through restrictive licensing. Implementing the proposed action would not limit or restrict the

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growth of the U.S. space industry, while implementing one of the alternatives could limit U.S. commercial launch and reentry vehicle development and growth, and implementing the no action alternative could severely limit and restrict the growth of the U.S. commercial space launch industry.

Decision and Order

I have considered potential environmental impacts as defined in the PEIS, applicable regulatory requirements, public comments, and FAA's responsibilities under 49 U.S.C., Subtitle IX, Chapter 701, Commercial Space Launch Activities to promote, encourage, and facilitate the growth of the U.S. commercial space transportation industry in arriving at my decision.

Alternatives 1, 2, 3, and the no action alternative would result in restrictive licensing that would impede the FAA's ability to assist the commercial space transportation industry in meeting projected demand for services and expansion into new markets. The preferred alternative would allow the greatest development and growth of the U.S. commercial space launch industry. In addition, although implementation of the preferred alternative would result in slightly greater environmental impacts than the overall impacts associated with the alternatives and no action alternative, the impacts are still expected to be less than significant. For the reasons summarized earlier in this Record of Decision and supported by detailed discussion in the PEIS, the FAA has selected the preferred alternative.

I have carefully considered the FAA's goals and objectives in relation to the programmatic licensing actions discussed in the PEIS, including the purpose and need to be served, the alternative means of achieving them, the environmental impacts of these alternatives at a broad, programmatic level, and the mitigation measures available to preserve and enhance the environment as needed on a site-specific basis. I have determined that all practicable means to avoid or minimize environmental harm from the alternatives selected have been adopted. Based upon the record of this proposed Federal action, and under the authority delegated to me by the Administrator of the FAA, I find that the action in this Record of Decision is reasonably supported.

Dated: May 8, 2006.
Patricia G. Smith,
Associate Administrator for Commercial Space Transportation.

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