DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration
Office of Commercial Space Transportation

Adoption of the Environmental Assessment
and
Finding of No Significant Impact and Record of Decision
for
Proposed Issuance of a Vehicle Operator License to Stratolaunch for Test and Operation of the Stratolaunch Talon-A Hypersonic Research Testbed Vehicle, Vandenberg Space Force Base, California

Summary

The United States Space Force (USSF) acted as the lead agency, and the Federal Aviation Administration (FAA) was a cooperating agency, in the preparation of the November 18, 2022, *Final Environmental Assessment, Test and Operation of the Stratolaunch Talon-A Hypersonic Research Testbed Vehicle, Vandenberg Space Force Base, California* (EA). The document analyzed the potential environmental impacts of Stratolaunch LLC (Stratolaunch) launching their Talon-A Hypersonic Research Testbed Vehicle (Talon-A), using a Carrier Aircraft, from the Mojave Air and Spaceport (MHV), Mojave, Kern County, California, and associated activities at MHV, Vandenberg Space Force Base (VSFB), Naval Base Ventura County (NBVC), San Nicolas Island (SNI), and the Broad Ocean Area (BOA) off the coast of California. The EA was prepared in accordance with the National Environmental Policy Act of 1969, as amended (NEPA; 42 United States Code [U.S.C.] § 4321 et seq.); Council on Environmental Quality NEPA-implementing regulations (40 Code of Federal Regulations [CFR] parts 1500 to 1508); 32 CFR Part 989, *Environmental Impact Analysis Process (EIAP)*; and FAA Order 1050.1F, *Environmental Impacts: Policies and Procedures*.

Stratolaunch proposes to perform launch and non-launch operations, utilizing a Carrier Aircraft to transport the Talon-A to the required altitude and location for each test or operational mission. Stratolaunch proposes to conduct flights of its Talon-A off the coast of California, taking off and landing at MHV, for the purposes of testing rocket powered aircraft in the hypersonic regime for government,

commercial, and academic purposes. The Department of the Navy (DoN) will authorize the use of facilities at NBVC and SNI in the event alternate landing areas for the Talon-A become necessary.

Stratolaunch is required to obtain a vehicle operator license from the FAA for launch operations of the Talon-A and to coordinate with the FAA for airspace closure approval prior to launch operations. Based on its independent review and consideration of the EA, the FAA issues this Finding of No Significant Impact (FONSI) and Record of Decision (ROD) concurring with, and formally adopting, the analysis of impacts and findings in the EA. The EA supports the FAA's issuance of a license to Stratolaunch, as well as potential future renewals and modifications of the Vehicle Operator License, for launch operations and related airspace closures for the Talon-A. If, in its license application to the FAA, Stratolaunch makes changes to its proposed operations that fall outside the scope of the EA, additional environmental review would be required prior to the FAA issuing a license associated with such an application.

After reviewing and analyzing the EA, including all available data and information on existing conditions and potential impacts, the FAA has determined that the issuance of a license to Stratolaunch and the approval of related airspace closures for launch operations of the Talon-A would not significantly impact the quality of the human environment within the meaning of NEPA. Therefore, the preparation of an Environmental Impact Statement (EIS) is not required, and the FAA is independently issuing this FONSI and ROD. The FAA has made this determination in accordance with applicable environmental laws and FAA regulations. The EA is incorporated by reference into this FONSI/ROD.

For any questions or to request a copy of the EA, contact:

Leslie Grey
Environmental Protection Specialist
Federal Aviation Administration
800 Independence Ave., SW, Suite 325
Washington DC 20591
leslie.grey@faa.gov
907.227.2113

Purpose and Need

The purpose of Stratolaunch's proposed project is to perform tests and operate the Talon-A vehicle via a Carrier Aircraft out of MHV. Talon-A vehicle tests and operations must be performed safely and in compliance with applicable Range Safety requirements and near a site with telemetry capabilities necessary to acquire Talon-A vehicle data from the release altitude to landing. Stratolaunch's Proposed

Project is needed to develop warfighting capability while utilizing a cost effective and reusable flight vehicle model. This proposed project would fulfill client requirements in the hypersonic technologies and warfare capabilities market as the industry changes.

Proposed Action

The FAA's Federal Action is to issue a license to Stratolaunch for launch operations of the Talon-A vehicle via a Carrier Aircraft based out of MHV. In addition to issuance of a Vehicle Operator License, the FAA's Federal Action also includes issuance of temporary airspace closures. All launch operations would comply with the necessary notification requirements, including issuance of Notices to Air Missions (NOTAMs) and Notices to Mariners (NOTMARs), as defined in agreements required for an FAA vehicle operator license. Under the Proposed Action, Stratolaunch would perform integration, mating, and propellant loading operations of the Talon-A and takeoff and landing of the Carrier Aircraft and Talon-A at MHV. The proposal includes use of mobile semi-trailer-based liquid oxygen (LOX) tanks that are certified for use on public roadways. The proposal also includes non-licensed, non-launch operations such as captive carry events of the Talon-A vehicle, separation tests of a non-powered Talon-A test article (a simulation of the Talon-A test vehicle), and glide flights where the Talon-A vehicle would be released from the Carrier Aircraft but the engine on the Talon-A would not power the vehicle and the vehicle would land at VSFB's Runway 12-30. Stratolaunch anticipates performing up to two licensed Talon-A hypersonic flight tests with an expendable Talon-A vehicle landing in the Pacific Ocean off the coast of VSFB. Subsequent licensed flights of a reusable Talon-A vehicle would land at VSFB using Runway 12-30.

Stratolaunch proposes to conduct licensed launches from MHV over a five-year period: two launches in Year 1, four launches in Year 2, 20 launches in Year 3, 40 launches in Year 4, with a maximum of 52 launches (one occurring each week) in Year 5. Stratolaunch anticipates high-valued flight assets or vehicle configurations may require an alternate landing option at SNI for certain missions. Alternate landings are anticipated to be unlikely with a frequency of no more than three per year.

Alternatives

Alternatives analyzed in the EA include (1) the Proposed Action and (2) the No Action Alternative. The No Action alternative provides the basis for comparing the environmental consequences of the Proposed Action. Under the No Action Alternative, the FAA would not issue a vehicle operator license to

Stratolaunch for Talon-A operations from MHV and not issue temporary airspace closures to accommodate the launches.

Environmental Impacts

The following presents a brief summary of the potential environmental consequences considered in detail in the EA for the Proposed Action. This FONSI/ROD incorporates the EA by reference and is based on the potential impacts discussed therein. The FAA has determined the analysis of impacts presented in the EA represents the best available information regarding the potential impacts associated with the FAA's regulatory responsibilities as described in this FONSI/ROD. The potential environmental impacts from the Proposed Action and No Action Alternative were evaluated in the EA for each environmental impact category identified in FAA Order 1050.1F. Chapter 3 of the EA describes the affected environmental and regulatory setting and identifies environmental impact categories that are not analyzed in detail since there are no resources in the study area: Environmental Justice; Cultural Resources; Geology and Earth Resources; Land Use, Aesthetic, and Visual Effects; Recreation/DOT Act Section 4(f) Resources; Utilities; Coastal Zone Management/Resources; Children's Environmental Health and Safety Risks; Natural Resources and Energy Supply; Farmlands; Visual Effects, Light Emissions, and Visual Resources/Visual Character; and Wetlands, Floodplains, and Wild and Scenic Rivers.

Chapter 4 of the EA provides evaluations of the potential environmental consequences of the Proposed Action for each of the environmental impact categories in detail and documents the finding that no significant environmental impacts would result from the Proposed Action. A summary of the environmental analysis for each impact category is presented below.

Air Quality

Section 4.1.1 of the EA states that under the Proposed Action there would be no construction-related emissions. Long-term emissions would be generated by the Carrier Aircraft transit flights, the safety Chase Aircraft, the maritime recovery vessel, and a support generator to provide electrical power to a mobile trailer at VSFB, if needed. Other sources of emissions would come from ground transportation of the Talon-A from VSFB to MHV.

Table 4-1 of the EA discloses that the Proposed Action would not exceed *de minimis* thresholds for any of the criteria pollutants. Air pollutant emissions would not result in violations of any regional air quality standards, including the National Ambient Air Quality Standards (NAAQS). Pollutants that are released

in the stratosphere do not mix with ground level emissions and do not have an effect on ground level air pollutant concentrations in any local area. Additionally, FAA report number FAA-AEE-00-01 DTS-34, *Consideration of Air Quality Impacts by Airplane Operations at or above 3000 feet AGL*, dated September 2000, states that these activities are exempt from analysis for local and regional air quality. Accordingly, rocket powered aircraft activities would have no impact on regional air quality.

Section 4.1.1 of the EA states the Proposed Action emissions would not exceed general conformity *de minimis* thresholds and are therefore not anticipated to contribute to exceedances of the NAAQS. Operational emissions associated with the Proposed Action, including Carrier Aircraft transit flights, safety Chase Aircraft flights, maritime recovery vessel use, a support generator to power a mobile trailer on VSFB (if needed), ground transportation of the Talon-A from VSFB to MHV, and employee daily commutes to and from MHV would generate long-term emissions. There are no components of the Proposed Action that would require approval by either the Federal Highway Administration or the Federal Transit Administration under transportation conformity.

Airspace closures associated with commercial space operations would result in additional aircraft emissions mainly from aircraft expending more fuel when being re-routed. Minimal additional emissions would be generated from aircraft departure delays. Airspace closures as a result of the Proposed Action would be relatively infrequent at first but would pick up in frequency as launch operations increase. The added time that affected aircraft spend being re-routed would be short-term. Thus, any delays in aircraft departures from affected airports would be short-term and any increases in air emissions from grounded aircraft are expected to be minimal and to occur in attainment areas. Therefore, these emissions increases are not expected to result in significant air quality impacts.

Marine vessels in the vicinity of the ship hazard areas (SHAs) would be notified of Stratolaunch operations by the NOTMAR and possibly incur additional transit time and delays. However, marine vessel density is low in these areas. Given the very low level of shipping traffic underlying the proposed Talon-A trajectory and that could occur within the SHAs, emissions from potential surface vessel rerouting would not be significantly different from those emissions generated along the original course. Because of the advance notice in the NOTMAR, short duration of the temporary SHAs, and infrequent occurrence of proposed launch activities, surface vessel operations would not result in additional emissions that would impact ambient air quality. Potential impacts on marine vessel re-routing would be temporary, infrequent, and result in a negligible increase in air emissions.

Therefore, the Proposed Action emissions would not exceed the NAAQS and not delay timely attainment of the NAAQS. The Proposed Action would not result in significant air quality impacts (EA Section 4.1, page 4-1).

Biological Resources (including Fish, Wildlife, and Plants)

Section 4.3 of the EA states that implementation of the Proposed Action would not result in significant impacts to wildlife and ESA-listed mammals, sea turtles, and fish species in the vicinity of the proposed carrier aircraft and Talon-A activities. This section of the EA states that the USSF conducted informal Section 7 consultation under the federal Endangered Species Act of 1973, as amended with the National Marine Fisheries Service (NMFS). USSF determined the Proposed Action *"may affect, but is not likely to adversely affect"* or would have "*no effect*" on federally listed species under NMFS's purview. USSF conducted consultation with NMFS for essential fish habitat (EFH), habitat areas of particular concern (HAPCs), and federally managed fish species. The USSF determined that the Proposed Action would not have adverse effects on EFH, HAPCs, or federally managed species, and that potential impacts to these resources would not exceed the minimal threshold (67 FR 2343-2383). NMFS concurred on February 4, 2022, that the Proposed Action would result in minimal impacts.

Section 4.3 of the EA also states that the USSF consulted with the U.S. Fish and Wildlife Service (USFWS). The USSF determined that the Proposed Action would have "*no effect"* to federally listed species or designated critical habitat, and the USFWS concurred.

Section 4.3.2 of the EA states that runway landings associated with Talon-A launch operations may generate a low-level sonic boom (less than 1.0 psf) over land where marine mammal or sea turtle haul-outs occur. However, the loudest sonic boom contours would occur in very small areas, would be below the 1.0 psf threshold of effects for hauled out species from in-air noise, and are not anticipated to result in adverse effects. Therefore, USSF determined the potential effects associated with exposure to sonic booms as a result of the launch operations over the BOA *"may affect, but are not likely to adversely affect"* all pertinent special-status marine species and would be discountable and insignificant since sonic booms would be below 1.0 psf and only occur over a small area.

Therefore, the Proposed Action would not result in significant biological resources impacts (EA Section 4.3, page 4-29).

Climate

Section 4.2.1 of the EA states FAA Order 1050.1F has not identified significance thresholds for climate and greenhouse gas (GHG) emissions. FAA has not identified specific factors to consider in making a significance determination for GHG emissions, especially as it may be applied to a particular project. Table 4-2 of the EA identifies the operational emissions of GHG emissions under the Proposed Action to be 1,702.9 metric tons of carbon dioxide equivalent (CO_2e). Though emissions from carrier aircraft and rocket powered Talon-A operations would increase the yearly levels of GHGs, the emissions would occur in the Mojave area and are well below Kern County's proposed significance threshold of 22,680 metric tons of CO_2e per year. Therefore, the Proposed Action emissions would not result in significant climate impacts (EA Section 4.2, page 4-3).

Hazardous Materials, Solid Waste, and Pollution Prevention

Section 4.4.2 of the EA states hazardous materials and waste would be handled and disposed of in accordance with state, federal, Department of Defense, and contract-specific requirements. Some propellants would remain in the Talon-A upon runway landing including LOX and Jet-A propellant.

Additionally, the testing and operation of the Talon-A would include the use of propellants and chemicals, and Stratolaunch would develop site-specific Spill Prevention, Control, and Countermeasure (SPCC) plans for both pre- and post-flight operations at MHV, VSFB, and SNI to allow for the quick containment of any spills during transport, use, or disposal of any petroleum-based chemicals, consistent with consistent procedures. The Proposed Action would comply with existing policies, procedures, and plans, and would implement measures described in the EA Section 2.6.2.

Section 4.8 of the EA addresses Solid Waste Management. Section 4.8.1 of the EA states, under the Proposed Action, up to 200 additional employees would be required at MHV which would generate about 0.89 tons of solid waste per day. These solid wastes generated as a result of the Proposed Action would be similar to those already handled at MHV, VSFB, and SNI. The amount of solid waste increase would be minimal.

Therefore, the Proposed Action would not result in significant hazardous materials, solid waste, or pollution impacts (EA Sections 4.4 and 4.8, pages 4-31 and 4-38, respectively).

Noise and Noise-Compatible Land Use

Section 4.6.2 of the EA states noise from the Carrier Aircraft and Chase Aircraft operating from MHV have no reportable or significant aircraft noise impacts due to the relative low number of aircraft operations by the Carrier Aircraft (estimated at most at once per week during the year). Stratolaunch Carrier Aircraft and Chase Aircraft takeoffs and landings are not expected to change the average Day-Night Average Sound Level (DNL) contours at MHV as reported in the 2012 Kern County Airport Land Use Compatibility Plan or elevate the DNL noise level more than 1.5 decibels (dB) over noise sensitive land uses above the acceptable levels of 65 dB since the transit flights between MHV and the Pacific Ocean would occur above 15,000 feet above mean sea level.

Section 4.3.2 of the EA states that operations of the Talon-A would create a sonic boom contour of less than 1.0 pounds per square foot (psf) that would occur over the Pacific Ocean. Temporary airspace closures resulting from Talon-A flights would not create noise impacts over sensitive land uses because aircraft would travel on existing en-routes and flight paths that are used on a daily basis to account for weather and other temporary restrictions. Any incremental increases in noise levels at individual airports would only last the duration of the airspace closure on a periodic basis and are not expected to meaningfully change existing DNL at the affected airports and surrounding areas.

Therefore, the Proposed Action would not result in significant noise impacts (EA Section 4.6, page 4-36).

Socioeconomics, Environmental Justice, and Children's Environmental Health and Safety Risks

The categories of environmental justice and children's environmental health and safety were not evaluated further because the proposed Talon-A operations would not affect these environmental resources.

Section 4.9 of the EA addresses impacts to surface traffic surrounding MHV and VSFB. Section 4.9.2 of the EA states that under the Proposed Action surface traffic demands on existing roads would be met without safety problems and would not require new traffic signals or major revisions to an existing traffic signal. This section of the EA states that the Talon-A would be transported about 195 miles from VSFB to MHV on a weekly basis by Year 5 of the Proposed Action's program. Primary roads would be expected to continue to meet traffic demands and be compatible with the long-term increase in personnel at MHV and VSFB. Consistent with FAA Order 1050.1F, the Proposed Action would not disrupt local surface traffic patterns or substantially reduce the levels of service of roads serving MHV and its surrounding communities and is consistent with existing and planned land uses at MHV.

Therefore, the Proposed Action would not result in significant socioeconomics impacts (EA Section 4.7, page 4-37).

Water Resources (including Wetlands, Floodplains, Surface Waters, Groundwater, and Wild and Scenic Rivers)

Section 4.10.2 of the EA states the Proposed Action does not include construction activities that could potentially introduce terrestrial surface and groundwater pollution at MHV, VSFB, or SNI. All land-based operations would occur at existing facilities and runways at MHV, VSFB or SNI. Existing spill plans would address any accidental spills associated with pre-flight and post-flight activities at these locations.

Section 4.10.2 of the EA addresses impacts to marine surface water in the Pacific Ocean by four proposed flights that will end with a water landing. Of these four flights, only two would require a license from the FAA. The two initial water landings are drop tests of the Talon-A (with no rocket engines) and would not require an FAA license. For the separation test flights, Stratolaunch expects the Talon-A vehicle to break into fragments after the hypersonic flight test; however, the vehicle may remain intact or break into fewer fragments. Stratolaunch would likely recover the fragments that float. Fragments that sink would ultimately reach the sea floor. The fragments would be composed of inert materials that are not chemically or biologically reactive.

Section 4.10.2 of the EA states that the Talon-A fuselage that contains tanks with Jet-A fuel propellant is anticipated to float and would likely be recovered intact during the ocean retrieval operations. This section of the EA estimates that up to 200 pounds of residual propellant (approximately 136 pounds/14.3 gallons of LOX, 62 pounds/9.3 gallons of Jet-A fuel) would be released into the ocean during the two expendable hypersonic test flights, which would be conducted about 6 months apart, and only in the event that the fuselage ruptures from the impact of the water landing. Any Jet-A fuel would evaporate within a day due to a combination of wave movement, oxygen exposure, and sunlight. Accordingly, it would not affect water quality in the short term (while the debris is floating or descending through the water column) or in the long term (when the debris settle into benthic habitats). LOX is a non-toxic cryogenic liquid that would evaporate into the air once released.

Therefore, the Proposed Action would not result in significant water resources impacts (EA Section 4.10, page 4-40).

Interagency and Intergovernmental Coordination and Consultation

Through the Interagency and Intergovernmental Coordination for Environmental Planning (IICEP) process, Space Launch Delta 30 (SLD 30) notified and consulted with relevant federal and state agencies on the Proposed Action and alternatives to identify potential environmental issues and regulatory requirements associated with project implementation. This coordination fulfills the Interagency Coordination Act and Executive Order (EO) 12372, Intergovernmental Review of Federal Programs (14 July 1982).

Public Involvement

On August 10, 2023, the USSF published the Draft EA and Draft FONSI on the USSF's website at https://www.vandenberg.spaceforce.mil/, beginning the public comment period. The USSF provided a public notice of the availability of the Draft EA for public review and comment through local newspaper advertisements. The public comment period ended on September 9, 2023. The USSF received 11 comments and considered all public comments when preparing the EA. Responses to the public comments are located in Appendix C of the EA.

Cumulative Impacts

This FONSI/ROD incorporates by reference the Section 4.11 of the EA, which addresses the potential impacts of past, present, and reasonably foreseeable actions that would affect the resources impacted by the Proposed Action. These actions include current and future aircraft operations at the airports, rocket launches, rocket engine testing, and development in the local area related to activities at MHV and VSFB, and any other development that may occur as a result of economic growth in the area. Given that the Proposed Action would not result in aircraft operational changes at MHV, VSFB, or SNI, and would result in a negligible increase over past, present, and reasonably foreseeable future operations, the Proposed Action would not result in significant cumulative impacts.

Agency Finding and Statement

The FAA has determined that no significant impacts would occur as a result of the Proposed Action. Therefore, the preparation of an EIS is not warranted and no mitigation measures are required as a condition of approval and a FONSI/ROD in accordance with 40 CFR §1501.6 is appropriate.

In accordance with CEQ regulation 40 CFR § 1506.3, paragraph 8-2 and FAA Order 1050.1F, the FAA has conducted an independent review and evaluation of the EA for test and operation of the Stratolaunch Talon-A Hypersonic Research Testbed Vehicle. Based on its independent review, the FAA has determined that the EA and its supporting documentation, as incorporated by reference, adequately assess and disclose the environmental impacts of the FAA's Federal Action and that the adoption of the EA by the FAA is authorized.

Accordingly, the FAA adopts the EA, appendices, and all information identified therein, incorporated by reference, and made publicly available.

After careful and thorough consideration of the adopted EA and the facts contained herein, the undersigned finds that the FAA's Federal Action is consistent with existing national environmental policies and objectives as set forth in Section 101 of NEPA and other applicable environmental requirements and will not significantly impact the quality of the human environment or otherwise include any condition requiring consultation pursuant to Section 102(2)(C) of NEPA. Therefore, an environmental impact statement will not be prepared.

The undersigned has carefully considered the FAA's statutory mandate under 49 U.S.C. § 40103 to ensure the safe and efficient use of the National Airspace System as well as the other aeronautical goals and objectives discussed in this EA. The undersigned finds that the FAA's Federal Action provides the best approach for meeting the purpose and need of that action.

Accordingly, under the authority delegated to the undersigned by the Administrator of the FAA, the undersigned approves and authorizes all necessary agency action to implement the FAA's Federal Action.

This decision signifies that applicable federal environmental requirements relating to the FAA's Federal Action have been met. The decision enables the FAA to implement that action.

STACEY MOLINICH ZEE

Digitally signed by STACEY MOLINICH ZEE
Date: 2023.11.06 09:05:52 -05'00'

APPROVED: _____ DATE: _____

Stacey M. Zee
Manager, Operations Support Branch

Right of Appeal

This FONSI/ROD constitutes a final order of the FAA Administrator and is subject to exclusive judicial review under 49 U.S.C. § 46110 by the U.S. Circuit Court of Appeals for the District of Columbia or the U.S. Circuit Court of Appeals for the circuit in which the person contesting the decision resides or has its principal place of business. Any party having substantial interest in this order may apply for review of the decision by filing a petition for review in the appropriate U.S. Court of Appeals no later than 60 days after the order is issued in accordance with the provisions of 49 U.S.C. § 46110.