[4910-13]

Department of Transportation

Federal Aviation Administration

Finding of No Significant Impact

Agency: Federal Aviation Administration (FAA), Department of Transportation (DOT)

Action: Finding of No Significant Impact

Summary: The Federal Aviation Administration (FAA) prepared an Environmental Assessment (EA) to evaluate Kistler Aerospace Corporation's proposal to construct and operate commercial launch and reentry/recovery facilities at the Nevada Test Site (NTS) on land withdrawn from the public domain for use by the U.S. Department of Energy (DOE). After reviewing and analyzing available data and information on existing conditions, project impacts, and measures to mitigate those impacts, the FAA, Associate Administrator for Commercial Space Transportation (AST) has determined that licensing the proposed launch and reentry activities is not "a major Federal action that would significantly affect the quality of the human environment within the meaning of the National Environmental Policy Act (NEPA) of 1969." Therefore, the preparation of an Environmental Impact Statement (EIS) is not required and AST is issuing a Finding of No Significant Impact (FONSI).

FOR A COPY OF THE ENVIRONMENTAL ASSESSMENT OR FINDING OF NO SIGNIFICANT IMPACT REGARDING KISTLER AEROSPACE CORPORATION LAUNCH/REENTRY OPERATIONS CONTACT: Ms. Michon Washington, Office of the Associate Administrator for Commercial Space Transportation, Space Systems Development Division, Suite 331/AST-100, 800 Independence Avenue, SW, Washington, D.C. 20591; phone (202) 267-9305; or refer to the following Internet address: http://ast.faa.gov

DATES: In accordance with NEPA, the FAA initiated a 30-day public review and comment period of the Draft EA for the Site, Launch, Reentry and Recovery

Operations at the Kistler Launch Facility. A public meeting was held in Las Vegas, Nevada on May 2, 2000, to record written and verbal comments from the public. The comments were addressed in a Comment Response Document and in the Final EA where appropriate.

PROPOSED ACTION: Kistler Aerospace Corporation (Kistler) proposes to conduct launch and reentry/recovery operations at the NTS. The operations would include pre-flight processing activities, launch/flight operations, and landing operations. Kistler proposes to construct a base of operations consisting of a private launch site (including a vehicle processing facility) for its exclusive use, a payload processing facility, and a vehicle reentry, landing, and recovery area. Because licensing launch and reentry operations is considered to be a major Federal action subject to the requirements of NEPA (Public Law 91-190), as amended, 42 United States Code (U.S.C.) § 4321, et seq., FAA must assess the potential environmental impacts of an applicant's proposed action.

Kistler intends to use a fleet of five K-1 vehicles at a maximum flight rate of 52 launches per year, once the system is fully operational, to deploy payloads into low earth orbit. The K-1 vehicle is designed as a two-stage fully reusable launch vehicle made up of a Launch Assist Platform (LAP) and an Orbital Vehicle (OV). Both stages are fueled by liquid oxygen (LO_X) and kerosene (RP-1), with the LAP using start cartridges containing a small amount of solid propellant to initiate the fuel flow. The K-1 is designed to require less pre-flight and post-flight processing and to minimize electronic, hydraulic, and fuel line connections/disconnections between flights. The K-1 would be the only launch vehicle used at the Kistler NTS facilities. The analysis in the Environmental Assessment is based on Kistler's conceptual engineering designs.

The Kistler facilities would be sited on the NTS, on land that is withdrawn from the public domain for use by the Department of Energy (DOE). The NTS is primarily an industrial area that previously hosted extensive nuclear tests. The NTS is bordered by the Nevada Test and Training Range (also known as the Nellis Air Force Range) on the north, east, and west sides and by Bureau of Land Management lands on the south and southwest. This is the site of frequent military aircraft training flights. Therefore, the NTS and surrounding communities are accustomed to land use for flight-testing purposes. The use of the NTS by Kistler for the purpose of launching and reentering launch vehicles is consistent with community planning activities in the areas around the NTS.

The FAA and the DOE are directly involved in the proposed action. The FAA is the lead federal agency for the NEPA process and is responsible for licensing and regulating Kistler's launch and reentry operations under 49 U.S.C. Subtitle IX—Commercial Space Transportation, ch. 701, Commercial Space Launch Activities, 49 U.S.C. §§ 70101-10121. The DOE is a cooperating agency for the NEPA process and will provide land and certain infrastructure to the Nevada Test Site Development Corporation (NTSDC). The NTSDC issued a subpermit to Kistler for Kistler's use of the site. The DOE prepared a *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada August 1996* (NTS EIS), in which it evaluated the implementation of a combination of alternatives including expanded use, no action, and alternative uses, i.e., non-defense and private endeavors, for the NTS. The DOE issued a Record of Decision (ROD) on December 9, 1996, in which it specifically identified Kistler as an example of a potential private use at the NTS. In accordance with Council on Environmental Quality (CEQ) regulations, this EA incorporates by reference the *Final Programmatic Environmental Impact Statement for Licensing Launches (AST, 2001)*, the *Final Programmatic Environmental Impact Statement for Commercial Reentry Vehicles* (PEIS Reentry Vehicles) (AST 1992), and the NTS EIS (DOE 1996).

NO ACTION: Under the No Action Alternative, Kistler would not propose to conduct launch/reentry operations at the NTS, and the FAA would not issue a license for Kistler to conduct launch or reentry operations. Kistler would not construct its launch facilities nor would it launch commercial satellites from the NTS.

ENVIRONMENTAL IMPACTS

Air Quality

Air emissions would result from the construction activities, launch, flight, and reentry operations. Fugitive dust, particulate matter, and engine exhaust concentrations created during construction activities are estimated to be less than federal or state standards. Maximum concentrations of PM_{10} produced during construction averaged over 24 hours should not exceed 135 micrograms/cubic meter, which is below the national and Nevada State standard of 150 micrograms/cubic meter. This maximum concentration would occur in a controlled area and thus would not pose hazards to the public or to on-site personnel. Carbon monoxide (CO), sulfur dioxide (SO_2), and nitrogen dioxide (NO_2) emissions from vehicle and equipment exhaust during construction were all estimated to be much less than federal or state standards and therefore would pose little to no impact on the environment.

Emissions from the K-1 launch vehicle would include those from the start cartridges (i.e., CO and hydrogen chloride [HCl]) and those from the K-1 engines during the launch (primarily CO_2, H_2O and CO). The 2.14 kilograms (kg) of HCl produced during one launch would be dispersed over a large area and would have little impact on air quality. Total CO emissions from a single launch include about three (3) kg from start cartridges, 8,179 kg from liftoff through the first 500 meters of the atmosphere, and 35,124 kg in the troposphere (500 meters to 20 kilometers). These estimated emissions from the

K-1 were compared to those of the Titan IIIE/Centaur. Titan IIIE/Centaur emissions are well documented. The K-1 CO emissions are estimated to be less than 50 percent of those generated by the Titan IIIE/Centaur. CO emissions are also expected to be much less than the six parts per million (ppm) Nevada standard for sites above 1,524 meters and less than the national standard of nine ppm. Thus, CO emissions are not expected to adversely affect air quality.

In the upper atmosphere beginning at about 20 kilometers, H_2O and CO_2 may be considered potential pollutants due to their low natural concentration and possible influence on the Earth's heat balance. Upper atmospheric emissions from the Kistler vehicle were compared to those of the Titan IIIE/Centaur. The K-1 would produce more CO_2 than the Titan IIIE/Centaur in the upper atmosphere, about 71 percent more in the stratosphere, and 109 percent more in the mesosphere and thermosphere. The K-1 would produce less H_2O in the upper atmosphere than the Titan IIIE/Centaur despite the fact that in the stratosphere the K-1 produces 33 percent more H_2O than the Titan IIIE/Centaur. The Programmatic Environmental Impact Statement for Licensing Launches states that launch activities appear to be many orders of magnitude below those that would be expected to produce detectable changes in the upper atmosphere. Therefore, launches of the K-1 should have minimal impacts on the upper atmosphere.

The operation and maintenance of the vehicle processing facility and launch site would generate additional air emissions. Fugitive dust air emissions could also occur from vacuuming operations performed on the LAP and OV between launches. However, this amount would be negligible and below the PM_{10} standards established for Nevada. Impacts to air quality from the proposed activities are expected to be insignificant.

Noise

Noise impacts would occur during construction, launch of the vehicle, and vehicle reentry. Construction activities and traffic noise would temporarily increase the ambient noise levels. Workers would wear protective hearing equipment in accordance with Occupational Safety and Health Administration (OSHA) regulations, when appropriate. The general public would not be in the immediate vicinity of the construction site. The closest public access is more than 32 km from the payload processing facility and launch site and more than 24 km from the landing and recovery area. At a distance of 24 km, noise levels are predicted to be less than 40 dBA, which would not be detectable under normal daytime background noise levels. Therefore, adverse impacts to the general public and construction workers as a result of construction noise are not expected.

Noise impacts during launches consist of the reusable launch vehicle's engine noise. Workers at the vehicle processing facility would be required to wear hearing protection devices for the first 18 seconds of launch during which time noise levels would be around 90 dBA. The predicted sound levels are well within occupational operating parameters for facility work and are all below 77 dBA for all offsite locations. No offsite locations would experience significant impacts due to launch sound levels.

Sonic booms would be generated during the vehicle ascent and the reentry stages descent to the landing and recovery area. Sonic boom levels generated under the flight paths would resemble distant thunder or, at most, a fireworks display and have no significant impact on surrounding communities. In the relatively small area where a focused boom occurs, individuals will experience a sudden and noticeable, but not harmful, overpressure equivalent to that felt inside a car when the door is slammed shut.

Socioeconomics and Environmental Justice

The proposed action is expected to create an average of 85 direct full-time jobs and 28 direct part-time jobs during construction and 90 direct full-time and 28 direct part-time jobs during normal operation. Of the total projected increase in workers, the majority is expected to live in the Las Vegas, Clark County area. Beneficial economic impacts of the proposed action may result from the added diversification of the regional economy and an expanded use of NTS resources. No negative socioeconomic effects on the region are expected as a result of the proposed action. In addition, no disproportionate effects on economically disadvantaged or minority groups are anticipated as a result of the proposed action.

Visual Resources

Visual resources are analyzed with respect to intensity and context. Kistler actions are classified as either "not noticeable" or "visually subordinate" and would take place in an area of moderate visual sensitivity. Kistler construction activities would not be visible by the general public. The visual impact of each launch would last less than five minutes. The area near the launch site has a substantial level of aircraft flight operations, many of which produce visible contrails not unlike those that would be formed by the K-1's engines. Upon reentry, the LAP and OV would be unpowered and would not produce a visual contrail. Thus, there are no expected impacts to visual resources.

Biological Resources

Vegetation

Construction of the proposed Kistler facilities would result in clearing vegetation from a total of over 671 acres. The total loss of vegetation, for the Kistler facilities would represent only about 0.008 percent of the total area of the Artemesia Type vegetation on the NTS. Because this plant

community type is common both on the NTS and throughout the Great Basin, the anticipated loss would represent only a small portion of this habitat type and would not adversely affect local or regional diversity of plants and plant communities.

Ground based operations at the vehicle processing facility and launch site would not affect vegetation. Buildings or pavement would cover both operational areas. The landing/recovery area would be impacted but would be permitted to re-vegetate naturally with herbaceous vegetation. Woody vegetation that could damage the landing bags on the K-1 vehicle would be selectively removed on a periodic basis.

Vegetation may be damaged or destroyed by high temperature exhaust gases produced by launching the K-1. A NASA study reported that a deposition of more than one gram per square meter of chloride is necessary to cause serious damage to many plant species. The K-1 launch vehicle would deposit about 0.009 grams per square meter over an area of 250,000 square meters or 0.468 grams per square meter per year based on an assumed maximum 52 annual launches. Therefore, adverse impacts to vegetation from HCl deposition are expected to be negligible.

Wildlife

Potential impacts to wildlife could be produced by construction-related activities such as noise, human presence, clearing, and grading and by operations-related phenomena, including launch noise, sonic booms, and vehicle launch emissions. Construction related impacts to wildlife could result in a permanent loss of available habitat and possible degradation of adjacent habitat due to an increase in noise and human activity. This habitat loss would not be expected to adversely affect the local or regional diversity of animal species or populations.

Day-to-day operations around the payload processing facility and launch site would not extend beyond the developed areas and would be expected to cause only minor disturbance to animals inhabiting the area. Although the Kistler facilities would be located outside of the range of the desert tortoise, the proposed project could impact this species. The desert tortoise is listed as threatened by the U.S. Fish and Wildlife Service. The NTS EIS assessed the potential mortality of desert tortoises resulting from expanding the use of the NTS. The level of traffic resulting from Kistler's construction and operations activities would not exceed the levels anticipated in the NTS EIS and so, would not result in any unanticipated increase in threat to the desert tortoise population on the NTS. Kistler-related workers would receive the same desert tortoise training required of all NTS workers.

Noise generated by vehicle launches on the NTS, including sonic booms, could cause a startle response and temporary hearing impairment to birds and mammals. These impacts are not expected to affect the viability or diversity of wildlife in the region. Wildlife is not expected to be adversely affected by Kistler launch/reentry operations.

Water Resources

The only perennial surface water in the vicinity of the proposed Kistler facilities is the man-made pond located between the payload processing facility and the launch site. Construction of the proposed facilities would not affect the quantity or quality of the water in this pond. Residues from processing and launch operations would be eliminated using existing drainage systems. Evaporation exceeds precipitation in the area, so there would be little downward migration of water from the surface. Therefore, it is not likely that any of Kistler's activities could affect groundwater quality. Spills of fuel or other materials used on-site during daily operations would be contained and cleaned up and any residue properly disposed. Therefore, no

adverse impacts to surface and groundwater are expected from the proposed launch/reentry operations.

Geology and Soils

The majority of Kistler's facilities would be constructed on the ground surface or near surface. Channels and berms would be constructed to minimize soil erosion caused by water around the landing/recovery area. Operation of the Kistler facilities would not affect subsurface geological media but could affect surface soils due to compaction from vehicle traffic and/or deposition of exhaust material. However, this impact is expected to be minor. Surface soils may show a slight increase in pH, which could have a minor beneficial effect on vegetation by increasing the availability of some plant nutrients.

Cultural and Native American Resources

A cultural resources reconnaissance of the proposed payload processing facility did not identify any historic properties; however, a reconnaissance of the proposed launch site and landing/recovery site identified two such sites. The first site is a previously recorded historic property that has been the subject of two previous data recovery efforts. The second site was previously undiscovered. A data recovery plan was prepared to avoid adverse impacts to the previously undiscovered site. The Nevada State Historic Preservation Office (SHPO) approved the plan and the Advisory Council on Historic Preservation (ACHP) concurred. The data recovery plan was implemented and completed and impacts to the site have been mitigated. It was also determined that additional data recovery efforts on the previously discovered site would not yield new significant information or contribute to the existing archaeological information already recorded from the site through the previous data recovery efforts (Nevada State SHPO September 23, 1997) (ACHP October 1, 1997).

To ensure that Native American concerns are considered and data recovery is conducted in a culturally sensitive manner, representatives of the Owens Valley Paiutes, Western Shoshones, and Southern Paiutes were invited to participate in all phases of data recovery. A Rapid Cultural Assessment was conducted of the proposed payload processing facility and launch site. The Rapid Cultural Assessment team recommended a number of measures to mitigate impacts to traditional cultural values connected to the area. Those recommendations were evaluated and implemented, as appropriate. The DOE, FAA, and Consolidated Group of Tribes and Organizations (CGTO) met to discuss potential impacts expected from the proposed Kistler project and the possibility of implementing appropriate mitigation measures. As a result, the DOE and FAA will implement the following mitigation measures prior to Kistler initiating operations (1) Preparation of a Rapid Cultural Assessment for the landing/recovery site, and (2) Permission for Tribal Elders to visit both the launch and landing/recovery sites. These measures will be undertaken with the involvement of Kistler, DOE, FAA, and the CGTO. Activities would be conducted in accordance with Section 106 of the National Historic Preservation Act of 1966.

Transportation

Additional on-site and off-site traffic generated by the Kistler activities is expected to be minimal. Existing on-site roads could accommodate additional traffic. Traffic on off-site roads would increase but would have almost no impact on traffic flow. The closing of two paved roads on the NTS during launch and reentry activities for approximately one hour per launch would be a temporary disruption to on-site traffic.

Safety and Health

Worker health and safety issues arise primarily from accidents during construction, decontamination, decommissioning, and maintenance activities as well as from explosions, fires, or spills. Generally, the impact would be

limited to workers within the vicinity of the accident. For hazardous operations including launch, workers would be located at safe distances in case of a catastrophic event.

Only accidents during K-1 flight have the potential to affect the public because of the remote and restricted location of the proposed Kistler operations. As part of the licensing process, FAA must determine whether K-1 operations pose unacceptable risks to public health and safety and not license operations that do so. Substantial hazards and risk are inherent in the operation of launch and reentry vehicles, and therefore, all reasonable precautions would be taken to minimize risk to public safety, health, and property. The flight ascent profile is designed to minimize risk to the public. A detailed flight hazard analysis will be conducted as part of a Safety Review under the auspices of the FAA before a determination is made regarding licensing. No significant impacts are expected to health and safety from the proposed Kistler operations on the NTS. The extent of the impacts on public health and safety on and off the NTS will be addressed in the required FAA Safety Review prior to issuance of a launch and reentry license.

Airspace

At no time does the launch vehicle enter airspace controlled by the FAA for general and commercial aviation. Most proposed Kistler flights stay within NTS or Nevada Test and Training Range airspace; however, certain launch trajectories require flight outside restricted airspace and above FAA controlled airspace. On these missions, vehicle altitude remains greater than 45,000 meters (150,000 feet) in airspace not used by general or commercial aviation.

The nearest air traffic route used by civil aviation that is over-flown by the K-1 during launch would be Jet Route 80-58 (J80-58), between Wilson Creek and Tonopah, Nevada. Upon reentry, the nearest air traffic route is J92 between

Beatty and Boulder City, Nevada. Because of the large horizontal and altitude separation distances, the nearest civil air traffic route structure would not be affected, and any potential impacts would be negligible.

Cumulative Impacts

The proposed action was evaluated for cumulative impacts on air quality, noise, socioeconomic, biological resources, cultural and Native American resources, transportation, and health and safety. In researching cumulative projects, the Department of Energy, Nevada Operations Office and the U.S. Air Force were contacted. The assessment of foreseeable future actions is based on information presented in the NTS EIS. No cumulative impacts are expected as a result of the proposed Kistler facilities and operations.

Other Alternatives

Prior to selecting the NTS as its preferred launch location, Kistler explored alternatives throughout the United States. Kistler considered the California Spaceport®, Spaceport Florida Authority's Launch Complex 46, and the proposed Southwest Regional Spaceport. The coastal locations were eliminated from consideration due to restrictions on the launch azimuths that could be used from that location. The Southwest Regional Spaceport was not selected as the preferred site because the NTS offered a more flexible range environment that is important to commercial operations.

No Action Alternative

Under the No Action Alternative, the FAA would not issue a license for Kistler to conduct launch and reentry operations from the NTS. The General Use Permit between DOE and the NTSDC would continue to exist but the subpermit between the NTSDC and Kistler would be void. Predicted environmental impacts of the proposed launch and reentry activities would not occur and the proposed project area would not be altered as a result of Kistler-related activities.

Consultation Activities

Seventeen tribes and organizations with ties to the NTS have aligned together to form the Consolidated Group of Tribes and Organizations. The Consolidated Group of Tribes and Organizations members prepared an American Indian assessment document to express their opinions and provide comments on the Environmental Assessment. A preliminary draft of the American Indian assessment document was submitted to members of the American Indian Writers Subgroup, the DOE, the NTSDC, and the FAA on August 31, 2000.

Following a review of the document, the DOE requested that a meeting between representatives of the American Indian Writers Subgroups, DOE, and FAA be held to discuss the document and revise the text for inclusion in the Kistler Environmental Assessment.

There are various locations where the Environmental Assessment contradicts or controverts Native American comments regarding environmental impacts. The data presented in the Environmental Assessment are supported by scientific findings whereas the Native American comments are not accompanied by any evidence to support assertions of environmental damage. Therefore these comments, while considered by the FAA in developing the Final Environmental Assessment, are not specifically included in the body of the document but are included in full as an appendix to the document. In addition, the CGTO was provided with an extended comment period and individual meetings were held between the CGTO, the DOE, and the FAA.

Determination

An analysis of the proposed action has concluded that there are no significant short-term or long-term effects to the environment or surrounding populations. After careful and thorough consideration of the facts contained herein, the undersigned finds that the proposed Federal action is consistent with existing national environmental policies and objectives as set forth in Section 101(a) of the National Environmental Policy Act of 1969 (NEPA) and that it will not significantly affect 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 for the proposed action is not required.

Patricia G. Smith

Associate Administrator for Commercial Space Transportation

Washington, DC

Date: 4/29/02