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FINDING OF NO SIGNIFICANT IMPACT (FONSI)

Environmental Assessment for Reentry, Landing, and Recovery Operations of a Varda Space Industries Capsule within Utah Test and Training Range South or Northern Dugway Proving Ground, Utah

BACKGROUND

Pursuant to provisions of the National Environmental Policy Act (NEPA) (42 United States [U.S.] Code [USC] §§ 4321–4270d), implementing Council on Environmental Quality (CEQ) Regulations (40 Code of Federal Regulations [CFR] §§ 1500–1508), Federal Aviation Administration (FAA) Order 1050.1F, and U.S. Department of the Air Force's (DAF's) Environmental Impact Analysis Process (32 CFR 989), the FAA prepared an Environmental Assessment (EA) to evaluate the potential environmental consequences associated with the reentry, landing, and recovery (RLR) operations of a 3-foot (ft) diameter aluminum capsule by Varda Space Industries, Inc. (Varda). The Proposed Action is to conduct RLR operations within the DAF's Utah Test and Training Range (UTTR) South and U.S. Department of the Army's Dugway Proving Ground (DPG) located in Tooele County, Utah. Varda would launch the capsule on a SpaceX Falcon 9 rocket from Vandenberg Space Force Base (SFB), California. Impacts associated with Falcon 9 launches at Vandenberg SFB have been addressed in the 2018 Supplemental EA for the Launch, Boost-Back, and Landing of the Falcon 9 at Vandenberg AFB.

The FAA is the lead agency for the preparation and coordination of the EA (40 CFR § 1501.7), and the DAF is a cooperating agency (40 CFR § 1501.8).

The EA, incorporated by reference into this finding, analyzes the potential environmental consequences of activities associated with the proposed action and provides environmental protection measures to avoid or reduce adverse environmental impacts. The EA considers all potential impacts of the proposed action and the No-Action Alternative. The EA also considers cumulative environmental impacts with other past, present, and reasonably foreseeable actions within the region that could interact with implementation of the proposed action near UTTR and DPG.

PURPOSE AND NEED

To commercialize space manufacturing, Varda needs cost-efficient logistics both to and from space. To fulfill its needs and that of the broader community, Varda has developed a scalable, cost-effective reentry capsule that can safely land terrestrially. This allows more frequent and flexibility of payload returns. Currently return capabilities are limited to costly human-rated vehicles. This significantly limits the types and frequency of activities that can be conducted in orbit, putting the U.S. at a costly competitive disadvantage, and reduces the schedule flexibility of reentry.

Varda's economical dual-use (commercial/government) reentry capsule systems are capable of hypersonic (Mach 25+) flight in support of Department of Defense (DoD) missions critical to national security. Varda is currently working with the DAF and U.S. Department of the Navy to support their Intercontinental Ballistic Missile (ICBM) and hypersonic weapons development. The reentry and hypersonic weapons development communities have lacked accessible flight testing capabilities, leading to significant schedule challenges and failed testing.

The purpose of the Proposed Action is to implement a series of capsule return test missions to assess processes for manufacturing products in space that require zero-gravity to fabricate and return those products to Earth using a small aluminum return capsule. In addition, Varda's capsule reentry system would serve as an ideal testbed to support the DoD's reentry and hypersonic weapons research by providing data on hypersonic flows and subjecting components and materials to hypersonic environments. The Varda test capsule and reentry operations supports the DoD's need to conduct hypersonic operations within representative flight environments at low cost, with high launch and return rates, and within a DoD-controlled test range with sufficient airspace and land area to accommodate the proposed RLR operations of the Varda capsule safely and securely and that has previously supported similar recovery operations.

PROPOSED ACTION/ALTERNATIVES

Section 2.1 of the EA provides a detailed description of the proposed action. Under the Proposed Action, Varda would conduct 4 RLR operations from 2023 through 2025 (or a maximum of 2 operations per year) within UTTR South or Northern DPG. Proposed RLR operations would only occur during daylight hours.

Based on an assessment of potential landing areas, only UTTR/DPG was determined to be the best-suited landing area based on the site selection criteria. It was the only area where the proposed capsule landing area would fit completely within DoD lands. Additionally, UTTR/DPG has the largest overland restricted airspace, as well as the largest overland contiguous block of supersonic-authorized, restricted airspace in the continental U.S. The population density is low and public access to UTTR/DPG is prohibited. Therefore, the Proposed Action as described below is the only action alternative that was carried forward for analysis in the Draft EA.

Reentry Operations and Airspace Management

The Varda capsule would enter UTTR airspace from the north-northeast along a south-southwest trajectory. The capsule would descend and slow and by the time it enters the airspace above the proposed landing area it would be at an altitude of 114,000 ft above mean seal level (MSL) and traveling at a speed of Mach 3.4. The capsule would descend along the proposed trajectory in a gradual fashion until it reached the area over UTTR South where it would then descend almost straight down to the proposed landing area within UTTR South and DPG. The proposed landing area would encompass approx. 321,000 acres: approx. 233,000 acres within UTTR South and 88,500 acres within the northern portion of DPG. Restricted airspace (R-) overlies the entirety of UTTR South (R-6406A) and DPG (R 6407 and R-6402A) and extends from the surface to 58,000 ft MSL. To enable descent and landing of the reentry capsule, FAA Air Traffic Organization (ATO) would coordinate and manage airspace outside of restricted airspace and UTTR Air Traffic Control (ATC) would coordinate and manage restricted airspace surveillance and clearance. All reentry operations would comply with the necessary notification requirements, including establishing and issuing flight restrictions and Notices to Air Missions (NOTAMs) and coordinating with FAA ATO.

To comply with the FAA's licensing requirements, Varda would enter into a Letter of Agreement (LOA) with FAA ATO, Space Operations, and any other ATO ATC facilities affected, and Headquarters UTTR to accommodate the flight parameters of Varda reentry operations. The LOA outlines and defines procedures for notification and real-time communication prior to, during, and after an operation; procedures for issuance of a NOTAM, including the time when the NOTAM is issued prior to reentry activities; and any additional measures deemed necessary to protect public health and safety. The Proposed Action would not require the FAA to alter the dimensions (shape and altitude) of the airspace. However, temporary closures of existing airspace may be necessary to ensure public safety during the proposed operations.

Landing Operations

After initial reentry and at approximately 16,400 ft MSL above the proposed landing area, the capsule would deploy a drogue parachute and a main parachute before landing. The parachute system uses a 6.2-ft diameter cruciform parachute as a drogue that provides the initial deceleration of the capsule, and a 21-ft diameter gliding triconical main parachute. The release of the drogue parachute strips the main parachute from the capsule compartment. The drogue parachute would land within UTTR South and would be recovered. The main parachute supports the descent of the capsule to the ground and would be recovered with the capsule. Total time for reentry and landing operations from the beginning of reentry to touchdown of the capsule within the proposed landing area would be approximately 16 minutes.

Recovery Operations

A Recovery Team would be pre-positioned outside of the landing area at Wig Support at Michael Army Airfield within the northeastern portion of DPG approximately 25 miles east of the center of the landing area. The Recovery Team would consist of 8-12 personnel from UTTR and Varda, and 2 helicopters (e.g., Bell 206). The helicopters would come from Woods Cross, approximately 7 miles north of Salt Lake City. The proposed landing area within UTTR South and DPG has been previously evaluated and used for similar operations, including previous NASA capsule recovery operations, and the Recovery Team would follow proven UTTR and DPG procedures and limit ground disturbances during recovery efforts.

Weighing less than 200 pounds, there are no extraordinary measures required for recovery and transport of the capsule and main and drogue parachutes. The capsule would primarily be handled manually with a small, specialized handling fixture which serves to cradle the capsule during transport like a small hammock. It is anticipated that the helicopters would land near the capsule touchdown point, personnel would safe and secure the capsule, and then load it and the main parachute into the helicopters. The capsule and parachutes would be transported to an airport either at Wendover, 35 miles to the northwest of the center of the landing area, or Michael Army Airfield on DPG, 31 miles southwest of the center of the landing area. The capsule and parachutes would then be packaged for shipping back to Varda Headquarters in California in a truck or van.

NO ACTION ALTERNATIVE

CEQ regulations require the inclusion of a No-Action Alternative in an EA to serve as the basis for comparing the environmental consequences of the Proposed Action with the existing (baseline) conditions. Under the No-Action Alternative, Varda would not conduct small capsule RLR operations at UTTR South or northern DPG. Varda and its DoD partners would be unable to gather data about hypersonic reentry conditions. Varda would not be able to perform any space-based research or develop on-orbit manufacturing capabilities. Data collected in orbit or during reentry could not be compared with scientific models, or estimations, or ground-based testing intended to simulate those environments. In addition, under the No-Action Alternative, the FAA would not issue a license to Varda for RLR operations at UTTR South or northern DPG. Therefore, although the No-Action Alternative would not meet the purpose of and need for the Proposed Action, it is carried forward for analysis in this EA as a baseline from which to compare the impacts of the action alternatives, as required by NEPA and CEQ regulations.

SUMMARY OF FINDINGS

The DAF has concluded that, by implementing standing environmental protection measures and operational planning, no significant impacts to the following resources would result from implementation of the proposed action. Therefore, it has been determined that an Environmental Impact Statement (EIS) is not required. Table 1 includes a summary of findings by resource area.

Table 1. Summary Comparison of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Air Quality	Under the Proposed Action, emissions of all criteria pollutants from proposed Varda capsule recovery operations would be below their respective annual *de minimis* levels, so a formal conformity determination would not be required, and a Record of Non-Applicability (RONA) has been prepared. Therefore, no significant impacts to local or regional air quality are anticipated with implementation of the Proposed Action.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.

Table 1. Summary Comparison of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Climate	Under the Proposed Action, insignificant greenhouse gas (GHG) emissions associated with the proposed Varda capsule recovery operations would not contribute to global warming to any discernible extent. Additionally, possible increases in GHG emissions caused by short-term airspace closures (e.g., from re-routed or grounded aircraft) during commercial space operations are not expected to result in significant climate-related impacts and therefore were not calculated for the Proposed Action. Therefore, no significant impacts to climate change are anticipated with implementation of the Proposed Action.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.
Noise and Noise-Compatible Land Use	Proposed Varda reentry operations would occur on the proposed trajectory a maximum of two times per year. There would be a maximum of two very low level (0.04 pounds per square foot [psf]) sonic booms per year along the capsule reentry trajectory during the period of 2023 through 2025. The proposed capsule reentry trajectory and associated sonic boom area within UTTR South and DPG underlies restricted military airspace where permitted supersonic operations occur. Therefore, proposed Varda reentry operations and associated sonic booms would not result in significant impacts to the regional noise environment in the vicinity of UTTR South and DPG.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.
Historical, Architectural, Archeological, and Cultural Resources	With implementation of the measures identified in the Programmatic Agreement (PA) between Hill AFB, the Utah SHPO, and the ACHP, which includes stipulations to assess impacts and mitigate any potential adverse effects to historic properties on UTTR South from the landing and retrieval of objects from space and high in earth's atmosphere, as well as mitigation and monitoring measures for capsule retrieval on DPG lands, there would be no significant impacts to cultural resources within the area of potential effect (APE) on UTTR South and DPG lands.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.
Department of Transportation Act Section 4(f) Properties	Within the proposed Varda capsule landing area there are 209 NRHP-eligible sites that are considered Section 4(f) properties: 93 on UTTR South and 116 on northern DPG. In addition, two Section 4(f) properties occur outside the landing area but are within the region of influence: Fish Springs National Wildlife Refuge (NWR) and Deseret Peak Wilderness/Uinta-Wasatch-Cache National Forest. Proposed Varda reentry operations would occur on the proposed trajectory a maximum of two times per year. A sonic boom at 0.01 and 0.02 psf that would be received at the NWR and National Forest, respectively, would be unlikely to be noticed from background ambient activities that would be occurring at the time of any sonic boom from the Varda capsule upon reentry. The Proposed Action would not substantially diminish the protected activities, features, or attributes of any of the properties identified, and thus would not result in substantial impairment of the properties. Therefore, the Proposed Action would not be considered a constructive use of these properties and would not invoke Section 4(f) of the DOT Act. The Proposed Action would not result in significant impacts on Section 4(f) properties.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.

Table 1. Summary Comparison of Environmental Consequences

Resource Area	Proposed Action	No-Action Alternative
Biological Resources	Under the Proposed Action, the proposed capsule landing area would occur within a large unvegetated playa or dry lake bed generally devoid of vegetation and wildlife, including special-status species. Any wildlife species potentially within the proposed capsule landing area are expected to move away at the sight of the capsule and associated parachute during its descent. Impacts to wildlife from the low-level 0.04 psf sonic boom would not be significant. Therefore, there would be no significant impacts to biological resources with implementation of the Proposed Action.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.
Airspace	Implementation of the proposed action is not anticipated to result in significant impacts to airspace use or management.	Under the No-Action Alternative, the proposed Varda capsule RLR operations at UTTR South/DPG would not occur. Consequently, baseline conditions would remain unchanged.
Cumulative Effects	No significant cumulative impacts would result from implementation of the proposed action. The proposed action, combined with other past, present, and reasonably foreseeable projects in UTTR South or northern DPG would not result in significant cumulative impacts.	No Impacts.

PUBLIC AND AGENCY OUTREACH

The DAF encourages and invites public/agency, tribal, and other participation in the NEPA process. Public participation opportunities with respect to this EA and decision making on the proposed action are guided by 32 CFR 989. Consideration of the views and information of all interested persons promotes open communication and enables better decision making.

All agencies, organizations, tribes, and members of the public with a potential interest in the proposed action were encouraged to participate in the decision-making process during the 30-day public comment period from 29 March 2023 to 27 April 2023. Printed copies of the Draft EA and Draft FONSI were made available to the public at the West Wendover City Hall, Wendover City Hall, and Tooele City Public Library and electronic (pdf) copies were available on the internet at:

https://www.faa.gov/space/environmental/nepa_docs.

A public notice notifying the public of the 30-day public comment period was published in the Tooele Transcript on 28 March 2023 and in the Salt Lake Tribune on 29 March 2023.

In addition, the DAF closely coordinated with the Utah State Historic Preservation Office (SHPO) and federally affiliated tribes with interest in the project area. Additional details on SHPO and tribal correspondence are included in the Final EA and incorporated here by reference.

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FINDING OF NO SIGNIFICANT IMPACT

Based on my review of the facts and analyses contained in the attached EA, conducted under the provisions of NEPA, CEQ regulations, and 32 CFR 989, I conclude that implementation of the projects identified in the EA would not have a significant environmental impact, either by themselves or cumulatively with other past, present, and reasonably foreseeable projects within the proposed landing area. Accordingly, an EIS is not required. The signing of this FONSI completes the environmental impact analysis process for this action.

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XXXX XXXXXXXX Date
U.S. Air Force
Commander Utah Test and Training Range