U.S. Department
of Transportation

Office of the Chief Counsel

800 Independence Ave., S.W.
Washington, D.C. 20591

Federal Aviation
Administration

Brad Powell
Associate General Counsel
Vast Space, LLC
2851 Orange Ave.
Long Beach, CA 90806

September 27, 2024

Re: "Reentry" and "Reentry Vehicle" Definitions

Dear Brad Powell,

This letter is in response to your August 5, 2024, request that the FAA clarify the definitions of "reentry" and "reentry vehicle." Specifically, you asked two questions related to Vast Space, LLC's planned space station, referred to as Haven-1.

Your first question was whether Haven-1 would be considered a "reentry vehicle" that would require a reentry license from the FAA. Section 50902(19) of Title 51 of the United States Code (51 U.S.C.) defines "reentry vehicle" as "a vehicle designed to return from Earth orbit or outer space to Earth, or a reusable launch vehicle designed to return from Earth orbit or outer space to Earth, substantially intact." The FAA codified that definition in § 401.5 of title 14 of the Code of Federal Regulations (14 CFR).[1] A license is required for reentries, defined as "to return or attempt to return, purposefully, a reentry vehicle and its payload or human beings, if any, from Earth orbit or from outer space to Earth." 51 U.S.C. 50902(16); *see also* 14 CFR §§ 401.5 and 401.7.

[1] In the Streamlined Launch and Reentry License Requirements Final Rule, the FAA adopted 14 CFR 401.7 as a new definition section. In the Final Rule, the FAA also stated that 14 CFR 401.5, the prior definition section, would be removed effective March 10, 2026. Between the effective date of the Final Rule and March 10, 2026, § 401.5 remains effective, but only applies to 14 CFR parts 415, 417, 431, 435, 440, and 460. The definition of "reentry vehicle" remains consistent between § 401.5 and § 401.7.

As you asserted in your request for interpretation, Haven-1 has not been designed in order to return substantially intact. Vast expects that most of the exterior parts of Haven-1 will demise while moving through Earth's atmosphere, which would not be considered substantially intact. You did note that Vast expects that some parts of Haven-1 will not demise in Earth's atmosphere, though such parts would be significantly damaged, likely beyond repair. The FAA considered such a situation when adopting the definition of "reentry vehicle," stating in the Commercial Space Transportation Reusable Launch Vehicle and Reentry Licensing Regulations Notice of Proposed Rulemaking that "the unintended, though foreseeable, return of an object capable of surviving reentry is not an event that requires licensing by the FAA." 64 Fed. Reg. 19,626, 19,630 (April 21, 1999). As the Haven-1 has not been designed to remain substantially intact through Earth's atmosphere, the fact that elements of Haven-1 will likely not demise is insufficient to reach the level of a reentry vehicle. In other words, based on the facts you have presented to us, Haven-1 would not be considered a reentry vehicle under the statutory and regulatory definition of "reentry vehicle."

Even if Haven-1 were considered a reentry vehicle under the statutory and regulatory definitions, there is also a purposefulness element to the definition of "reentry." When the FAA codified the statutory definition of "reentry" into the regulations, the FAA made clear in the Final Rule that the knowledge that debris may not fully demise in Earth's atmosphere is not sufficient to reach the level of purposefulness required for a reentry license. *See* 65 Fed. Reg. 56,618, 56,623-24. As that is the situation you have presented, it is not necessary for Vast to obtain a reentry license for Haven-1.

Your second question was whether a payload with the characteristics of Haven-1 would be considered a "reentry vehicle." Your request included a variety of characteristics of Haven-1 that support the assertion that Vast has not designed Haven-1 to be purposefully returned from orbit or to return from orbit substantially intact. For example, you note the lack of a heat shield, parachutes, inflatables intended to mitigate the shock of Earth impact, or a locator beacon. You also note that Haven-1 will lose its propulsive capability after the deorbit maneuver is performed and will lose its ability to adjust its attitude in Earth's atmosphere due to component demise.

As stated above, a reentry vehicle is a vehicle designed to return substantially intact to Earth from Earth orbit or outer space. The characteristics proffered suggest that a payload with those characteristics would not be designed to return substantially intact. Not having elements to protect the payload in the atmosphere (such as a heat shield), elements to mitigate impact (such as parachutes or inflatables), or elements to facilitate locating the damaged payload post-impact all support the conclusion that a payload was not designed to return to Earth substantially intact.

In your request for interpretation, you referenced a recent FAA publication related to reentry vehicles. In April 2024, the FAA published a Federal Register notice entitled "Launch of a Reentry Vehicle as a Payload That Requires a Reentry Authorization To Return to Earth." 89 Fed. Reg. 27,473 (April 17, 2024). That notice was intended to clarify that, while reentry

vehicles can be launched as payloads, being classified as a payload at launch does not remove the need for a license upon reentry. However, that notice is not applicable here, as Haven-1 would not be considered a reentry vehicle and therefore would not need a reentry license.

We appreciate your patience and trust that the above addresses your concerns. If you need further assistance, please contact my staff at (202) 267-3073. This response was prepared by Julie Phillips, Attorney in the Regulations Division of the Office of the Chief Counsel.

Sincerely,

LAURA JANE MEGAN-POSCH

Digitally signed by LAURA JANE MEGAN-POSCH
Date: 2024.09.27 14:01:52 -04'00'

Laura J. Megan-Posch
Assistant Chief Counsel for Regulations