

April 8, 2024

Director Richard DalBello
Office of Space Commerce
Herbert C. Hoover Building, Room 68015
1401 Constitution Ave. NW
Washington, DC 20230

Re: Response to RFI on Private Remote Sensing Satellite Disposal and Debris Mitigation

Dear Director,

Vast Space, LLC (Vast) appreciates the opportunity to respond to the the Commercial Remote Sensing Regulatory Affairs (CRSRA) division's Request for Information (RFI) regarding Private Remote Sensing Satellite Disposal and Debris Mitigation.¹

Company Background

Vast is a U.S. company based in Long Beach, California, participating in NASA's second Collaborations for Commercial Space Capabilities (CCSC-2) program through NASA's Commercial Low Earth Orbit program office.² Vast plans to design, build, and operate a private, habitable space station called Haven-1, which will launch on a SpaceX Falcon 9 no earlier than (NET) August 2025. The Haven-1 space station is being designed for an operational life of three years. During that three-year period, Haven-1 will accommodate crewed operations with crewed missions arriving and departing on SpaceX Dragon. The station will also host pressurized payloads within the cabin. At mission end, the station will deorbit via controlled reentry. In preparation for the Haven-1 mission, Vast is designing a demonstration spacecraft called Haven-Demo, which will launch on a SpaceX Falcon 9 NET January 2025. The Haven-Demo spacecraft will fly sub-systems and components that Vast plans to use for Haven-1 to increase their flight heritage and further reduce technical and operational risk ahead of the Haven-1 launch. For both missions, Vast will be applying for FCC licenses and addressing its orbital debris and spacecraft disposal responsibilities through those applications. And for both missions, Vast's spacecraft will be carrying imaging equipment—Vast plans to consult with CRSRA to determine whether its imaging equipment will require a CRSRA license.

¹ 89 FR 16730 (March 8, 2024)

² See Press Release, NASA, Seven US Companies Collaborate with NASA to Advance Space Capabilities (Jun. 15, 2023), <https://go.nasa.gov/4bz6wHa>.

Considerations for CRSRA's Subsection (b)(4) Authorities³

1. For CRSRA licensees whose spacecraft are not licensed by the FCC, Vast supports CRSRA's evaluation of its subsection (b)(4) authorities in the context of preserving the safety and sustainability of the low-Earth orbit (LEO) environment, including for habitable space stations. Vast's Haven-1 space station is scheduled to be on orbit NET August 2025, well before International Space Station (ISS) operations end in 2030. NASA has already invested over \$555.6 million toward developing commercial low-Earth orbit destinations (CLDs) with specific aim to enable a successful transition from the ISS program to commercial programs.⁴ As NASA has stated, "[i]t is in the interests of the United States that a seamless transition be made from ISS to one or more future CLDs such that no gap in the Government's ability to use low Earth orbit platforms is experienced."⁵ Vast's missions will be serving this national need and enabling the fastest, lowest risk approach to ensuring that the country avoids a crewed LEO gap following ISS retirement. Accordingly, Vast encourages CRSRA to consider the safety and freedom of operations of crewed space stations beyond the ISS in the evaluation of its subsection (b)(4) authorities for satellites without FCC licenses.
2. For CRSRA licensees whose spacecraft are not licensed by the FCC, Vast supports CRSRA's evaluation of its subsection (b)(4) authorities in consideration of an equivalency standard to CRSRA licensees whose spacecraft are also licensed by the FCC. CRSRA licensees who are also licensed by the FCC most commonly satisfy the FCC's licensing requirements related to debris mitigation by designing their systems to meet NASA's process for limiting orbital debris (NASA-STD-8719.14) and by using NASA's publicly available Debris Assessment Software (DAS) to demonstrate their adherence to that standard, ultimately generating an Orbital Debris Assessment Report (ODAR) with supporting technical artifacts as the documentation supporting the licensing requirement.⁶ This approach could be used to accomplish equivalency of current regulatory requirements between CRSRA licensees with and without FCC licenses. Vast is also aware of other approaches to debris mitigation, though, such as the European Space Agency's recently issued space debris mitigation requirements (ESSB-ST-U-007).⁷ This is why Vast encourages CRSRA to consider the appropriate equivalency standards when evaluating CRSRA's subsection (b)(4) authorities for satellites without FCC licenses.

³ As used herein and in the RFI, "subsection (b)(4) authorities" refers to 51 USC 60122(b)(4) ("...upon termination of operations under the license, make disposition of any satellites in space in a manner satisfactory to the President").

⁴ See Press Release, NASA, NASA Selects Companies to Develop Commercial Destinations in Space (Dec. 2, 2021), <https://tinyurl.io/ATxM>; and Press Release, NASA, NASA Selects First Commercial Destination Module for International Space Station (Jan. 27, 2020), <https://tinyurl.io/Aa0J>.

⁵ International Space Station Transition Report pursuant to Section 303(c)(2) of the NASA Transition Authorization Act of 2017 (P.L. 115-10), NASA, at 5 (Jan. 2022), <https://tinyurl.io/ATxL>.

⁶ See NASA-STD-8719.14, Process for Limiting Orbital Debris, <https://standards.nasa.gov/standard/nasa/nasa-std-871914>; see also, NASA Debris Assessment Software, <https://software.nasa.gov/software/MS-26690-1>.

⁷ See generally, ESA, Space Debris Mitigation, <https://technology.esa.int/page/space-debris-mitigation>.

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3. While Vast supports the principle of equivalency between CRSRA licensees with and without FCC licenses—i.e., in terms of licensing requirements related to orbital debris mitigation and post-mission disposal—Vast recognizes that CRSRA's subsection (b)(4) authorities and the FCC's implementation of its statutory authorities may differ in scope. For example, the FCC administers orbital debris mitigation requirements through its licensing process in a manner that is not limited by the "termination of operations" context of CRSRA's subsection (b)(4) authorities.⁸ Vast supports the continued efforts of CRSRA and the Office of Space Commerce to further clarify and harmonize U.S. jurisdictional authorities for space missions.
 4. Vast appreciates CRSRA's changes in 2020 to its regulations to avoid duplicative regulatory requirements already being met through the FCC licensing process, and Vast supports a continuation of this policy. As indicated above, Vast recognizes the critical importance of preserving the safety and sustainability of the LEO environment, especially for human spaceflight missions, and is designing its spacecraft and planning its missions accordingly.

Sincerely,

Brad Powell
Associate General Counsel
Vast Space, LLC

⁸ See generally, 45 CFR 45.114(d)(14) (implementing orbital debris mitigation licensing requirements for FCC-licensed spacecraft in a manner that reflects the full scope of the U.S. Orbital Debris Mitigation Standard Practices and NASA-STD-8719.14).