

5 April 2024

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

Re: RFI Response: Private Remote Sensing Satellite Disposal and Debris Mitigation (Document No. 2024-05004)

Dear Director DalBello:

On behalf of the 30,000 professional members of the American Institute of Aeronautics and Astronautics (AIAA)—the world’s largest aerospace professional society—I would like to offer our perspectives on the Office of Space Commerce (OSC)’s RFI on Private Remote Sensing Satellite Disposal and Debris Mitigation. As a technical society for aerospace professionals, our members lead research and development (R&D) applicable to areas such as aerospace design, manufacturing, testing, operations, and training. We share the Department’s continued commitment to safe, sustainable, and viable operations in space.

AIAA supports the Commercial Remote Sensing Regulatory Affairs (CRSRA) in updating its 2020 regulations to once again require remote sensing license applicants to submit a disposal and orbital debris mitigation plan to CRSRA, as well as to supervise these elements of their system operation. AIAA believes that CRSRA should pursue revising the subsection (b)(4) license requirement, implementing a narrow guidance but not necessarily rising to the level of rulemaking, for owner/operators that do not have a current FCC license and clarify acceptable means of compliance with CRSRA’s existing/revised license conditions.

Without a unified collective action between OSC, the Federal Communications Commission (FCC), and foreign licensee organization(s) and regulators, the current situation of long-term sustainability of outer space activities will decline. CRSRA should not develop a new set of rules/regulations/requirements but rather lead the effort to unify the currently developed set of multinational rules, supplement the current rules where applicable with agreement from all parties, and publish the unified set of rules/regulations/requirements, enabling all companies and operators to adhere to the same set of operating standards in developing their space system(s).

We appreciate the opportunity to provide our RFI Response: Private Remote Sensing Satellite Disposal and Debris Mitigation (Document No. 2024-05004). The critical role of the OSC in driving the U.S. lead in commercial space is vital for our future.

Please contact me for any additional assistance.

Sincerely,



Dan Dumbacher
Chief Executive Officer
American Institute of Aeronautics and Astronautics

1. Articulate the benefits and drawbacks of CRSRA clarifying its supervision of remote sensing system disposal and orbital debris mitigation under its existing authorities.

CRSRA should lead the unified effort and approach on the compliance with the rules and regulations of the license through a supervisory role of the owners and operators; CRSRA should ensure that the owners and operators clearly and easily understand which rules take precedence without creating conflict; CRSRA should acknowledge that there is a need for pre-flight assurance that the approved system will be responsibly disposed of, and CRSRA understands that the desired established behaviors will evolve over time.

Initially, CRSRA, the FCC, and other applicable U.S. government agencies need to ensure they communicate coherently with each other. They also must develop and determine how to ensure that following the agreed upon rules, regulations, and requirements are not too onerous to adhere to while maintaining business viability. The intent is not to drive operators offshore before multinational agreement, but to enable best practices. Additionally, avoiding “too onerous” requirements should not be misconstrued as a rubber stamp—ultimately the primary goals are multinational space situational awareness and continued safe space operations. Once CRSRA has the U.S. rules, regulations, and requirements agreed upon, it needs to lead the same effort multinationally.

CRSRA should not develop a new set of rules, regulations, and requirements but rather lead the effort to unify the current developed set of multinational rules and understandings to supplement where applicable with agreement from all parties, and then publish the unified set of rules, regulations, and requirements, enabling all owners and operators to adhere to the same set of ground rules in developing their space system(s). Additionally, the development of commercial LEO destinations and In-space Servicing, Assembly and Manufacturing (ISAM) systems will likely result in other opportunities for reuse of materials, components, and entire systems, as well as further developing currently employed methods. Incentivizing evolving disposal opportunities is favorable over a purely prescriptive approach.

2. Recommend which industry standards and best practices CRSRA should consider.

CRSRA should adopt/evaluate current best practices such as, but not limited to:

- a. [IADC Space Debris Mitigation Guidelines](#)
- b. [Satellite Orbital Safety Best Practices](#)
- c. [NASA – Process for Limiting Orbital Debris](#)
- d. [Astra Carta](#)
- e. [Artemis Accords](#)
- f. [White House – National Orbital Debris Implementation Plan](#)
- g. [U.S. Government Orbital Debris Mitigation Standard Practices](#)
- h. [National Space Traffic Management Policy](#)

3. The current subsection (b)(4) license requirement.

CRSRA should work with the State Department to develop and promote common standard approaches among U.S, government agencies, allies, and all spacefaring nations. Uniformity of appropriate behavior is the goal, not strict enforcement. Given the operational lifetimes and significant variation in the number of objects operated

by various parties, a single approach may not be the best approach or even feasible. The revised subsection (b)(4) controls and oversight requirements may be driven by orbit density and complexity of interactions (multinational interactions). CRSRA could identify certain orbits for less complex missions, such as demonstration/experimental missions. Positive compliance mechanisms may differ between small and larger constellation operators: the former will primarily be influenced before flight while the latter, if the constellation is partially in place or being resupplied, could have future launches suspended until corrective actions are taken. Best practices, lessons learned, and statistical reliability information for satellite disposal and debris mitigation should be shared to all operators to encourage the development and improvement of standards over time. Any compliance requirement should be waived if termination of operations is caused, directly or indirectly, by adversarial actions or unapproved actions or behaviors by foreign operators. Consequences for noncompliance should be the responsibility of perpetrators of undesirable behaviors and not the licensees affected.

4. CRSRA-approved disposal plans including atmospheric reentry, maneuvering to a storage orbit, or direct retrieval.

It is the responsibility of the licensing authority and the supervising authority to align with disposition plans in effect when each authority is active. This needs to be a matter of standard practice rather than bubbling up to the Assistant Administrator unless a waiver is required for some overarching need.

As discussed above, another area of satellite disposal that should be addressed is In-space Servicing, Assembly and Manufacturing (ISAM) system disposal. ISAM will likely result in other opportunities for reuse of materials, components, and entire systems while potentially creating its own source of debris.

5. Recommend the type and content of documentation regarding disposal and orbital debris mitigation plans CRSRA should require.

CRSRA should work with the State Department to develop and promote common, standard approaches among U.S. government agencies, allies, and friendly nation states. A goal would be to develop or expand an international space traffic management organization (ISTMO) (see Section 1)

In a future state, the evidence of compliance provided would ideally be a statistical model reflecting the possible degradation of the satellite's operating modes and the likelihood of the degradation's occurrence. Until that has been developed, a method for trusted authority verification of the statistical evidence of compliance should be required to ensure all satellite operators share in the responsibility of preserving a safe environment for navigation and trade.

In addition to the information contained in Section 2, CRSRA should evaluate:

- A. Space Traffic Management—Towards a Roadmap for Implementation. [The 2018 IAA study on STM.](#)
- B. [International Space Traffic Management. Charting a Course for Long-Term Sustainability.](#)

6. Describe if there are disposal and orbital debris mitigation considerations that are unique to remote sensing systems.

In a general sense, the answer is no, remote-sensing systems disposal should conform to current U.S. government regulations and agreements. However, remote-sensing systems could, if tasked accordingly, provide alternative options for ensuring compliant disposal of the system. There may be failure modes that would require immediate disposal of some systems while some sensing systems may be able to continue to operate in a degraded mode while still ensuring their ability for safe disposal at a later time.

Remote sensing systems may have unique characteristics such as large platforms or constellation systems. Constellation systems offer some graceful degradation of sensing capability if individual satellites fail and require early disposal of individual satellites while the constellation continues to provide services. Feedback from operators on the health of each satellite within a constellation and on the constellation as a whole is important when revisiting plans for end-of-life disposal.

7. Recommend methods by which CRSRA could verify compliance with the license requirement to make disposition of satellites.

Primary tracking will be performed by current U.S. government resources. CRSRA should leverage commercial tracking options for ensuring systems under their licensing and supervision requirements complete compliant disposal maneuvers. While U.S. government sources can precisely track systems over a period of days, timely feedback on compliance before “safing” would allow CRSRA to communicate with operators in case they have any issue with the disposal result before the system is put into a “safe” condition allowing for a better outcome.