December 26, 2023

Office of Commercial Space Transportation
Federal Aviation Administration
800 Independence Avenue SW
Washington, DC 20591

RE: Docket No. FAA-2023-1858, Mitigation Methods for Launch Vehicle Upper Stages on the Creation of Orbital Debris

The Aerospace Industries Association (AIA) represents over 320 American aerospace companies and an industry employing over 2 million U.S. workers. Across AIA's member companies are the suppliers, manufacturers, launch providers, and operators of commercial, civil, and national security satellites and space vehicles. AIA submits the following comments in response to Docket No. FAA-2023-1858, Mitigation Methods for Launch Vehicle Upper Stages on the Creation of Orbital Debris.

Request for Supplemental Rulemaking

Given the comments below, the comments expected from other stakeholders, and current legislative activity that could impact the roles and responsibilities of Federal agencies in the regulation of orbital debris, AIA requests the FAA develop a supplemental proposal before proceeding to final rulemaking in this matter. A supplementary proposal will allow the FAA to incorporate the important technical changes being raised by industry here and in other anticipated comments. Moreover, additional time will allow the proposed rule to reflect any changes Congress passes that may impact orbital debris roles and responsibilities.

Avoid Duplicative Requirements

AIA is concerned with the creation of a new set of standards that are similar, but not identical to the 2019 Orbital Debris Mitigation Standard Practices (ODMSP). A single set of requirements for all launches, both government and commercial would avoid confusion, support streamlining efforts, and support ongoing efforts to reduce overlapping and conflicting launch requirements between the FAA, DOD, and NASA. If FAA moves forward with any requirements outside ODMSP, those should be identified as alternate means of compliance via advisory circulars.

Alternative Means of Compliance

AIA supports allowing the use of TOR-2023-01395, "Disposal Options for Selected Orbits," which is being updated as part of U.S. Space Forces' Phase 3 Procurement, to be an accepted means of compliance for satisfying Part 453 requirements for the orbit regions analyzed. This document is the result of extensive analysis by the Aerospace Corporation and allowing its use would greatly reduce the analysis burden on launch operators.

Maintain Disposal Orbits

AIA supports continued use of disposal orbits for missions to MEO and GEO. Disposal orbits for these missions are proven, and practical alternatives are not available. The FAA should not take action to eliminate the use of these orbits until (1) a commercially feasible alternative exists *and* (2) actual negative impacts on space activity are identified if the use of these orbits is continued. For debris released into the geosynchronous region, the rule should allow for graveyard orbit disposal if the final perigee altitude of a mission and any associated debris remains above 35,986km, consistent with the Orbital Debris Mitigation Standard Practices (ODMSP).

25-Year Deorbit

For uncontrolled atmospheric disposal, the proposed rule requires upper stages and components left in LEO to deorbit within 25 years of launch. The FAA characterized the proposed rule as a common standard and current requirement for other U.S. government launches. AIA supports the proposed 25-year time period. Moreover, for vehicles that end with perigees below 600km, no additional analysis should be required to demonstrate that such stages will passively reenter given that existing determination.

No Disposal Preference

The proposed rule does not stipulte a preference of disposal methods. AIA supports this approach. Disposal orbits and passive atmospheric reentry are equally acceptable choices for upper stage disposal and should remain a launch service provider decision based on the mission, launch vehicle, and related parameters.

Off-Nominal Disposal

The proposed rule requires a description of how the launch system will achieve controlled atmospheric disposal under nominal and off-nominal conditions. This proposal is impractical and unnecessary, particularly given that nominal flights which generate equivalent debris are permitted a passive atmospheric reentry disposal option under the proposed rule. AIA supports removing this proposal.

Orbital Debris Assessment Plan (ODAP)

The FAA proposes licensed operators to submit an Orbital Debris Assessment Plan (ODAP) no less than 60 days before the licensed or permitted launch or reentry. AIA suggests the ODAP timeline be aligned with the flight safety analysis at no less than 30 days. Further, there is concern elements of the ODAP overlap with the FCC's requirement for an Orbital Debris Assessment Report ("ODAR"). AIA encourages the FAA to coordinate with the FCC to ensure no duplication in requirements occur.

Casualty Requirements

For uncontrolled reentries, the FAA requires an operator to satisfy either an expected casualty (E_C) of 1×10^{-4}, or an equivalent effective casualty area of 7 square meters. AIA is concerned with the state of existing modeling capability for all launch vehicle types to properly conduct this assessment. Moreover, further refinement of these capabilities will likely require already constrained FAA and Space Force

resources that are not available in the near term. AIA recommends the deferred implementation of this requirement until better tools and modeling are developed.

Waivers

The proposed rule does not include a waiver process or equivalent levels of safety determination process. Such processes have proved important in other aspects of FAA's launch and reentry licensing and AIA supports their inclusion here.

Testing Requirements

The proposed rule requires environmental qualification and acceptance testing to demonstrate that no debris will be released from the upper stage. The proposed rule states that such testing, "could include vibration, shock, vacuum, or any other appropriate testing." As proposed, the rule is vague, and AIA supports more specific language on the required testing to satisfy the rule. Any specifically named testing or demonstration should be ordinary to a typical spacecraft test campaign and limit overly burdensome or costly requirements.

Inconsistent Use of "Launch Operator" Term

The NPRM is inconsistent with the use of terms and lacks definitions for several terms that have a significant impact on the applicability of the proposed rule. Written throughout the NPRM is the term "launch operator." AIA recognizes the proposed rule is intended to cover both launch and reentry operations but has concerns that the term "launch operator" is used too loosely. It is unclear in each instance where the term "launch operator" is used whether that use is intended to apply to a launch vehicle or a launch and reentry vehicle. If each use is intended to be encompassing of reentry, then the entire NPRM needs to be reviewed to make sure the terminology used for each portion of the regulation is correct for the intended operation. For example, the entirety of proposed Part 453 should not or could not reasonably apply to reentry (see, e.g., Part 453.9(b)). AIA asks that a supplemental NPRM include more specific terminology around the applicability of each regulation to launch and/or reentry.

Unclear Definitions of "Component" and "Payload"

AIA has concern about a lack of definition for the terms "Component" and "Payload" used in several places in the NPRM. These terms can be interpreted broadly and in almost all cases, fall outside the FAA's authority to provide oversight. AIA requests the FAA define these terms more narrowly and ensure they only capture activity within the FAA's authority.

Sharing of Ephemerides

A recent pilot project was conducted between a space situational awareness provider and a U.S. launch provider to assess whether the time to identify, catalog, and/or screen newly launched spacecraft for potential conjunctions could be reduced through increased information sharing by spacecraft operators. The pilot project demonstrated the time to identify and catalog a newly launched payload and include its positional information in regular conjunction screenings could be reduced from weeks to days when spacecraft operators shared their ephemerides with space traffic coordination authorities. AIA supports encouraging the ODAP to contain procedures for this type of sharing of information.

Thank you for the opportunity to comment on this rulemaking. We look forward to our continued collaboration with the Office of Commercial Space Transportation on issues impacting the U.S. space industry.

Sincerely,

Mike French
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Aerospace Industries Association