April 15, 2020

VIA ECFS

Ms. Marlene Dortch
Secretary
Federal Communications Commission
445 12th Street, SW
Washington, D.C. 20554

Re: Notice of Ex Parte Presentation

Mitigation of Orbital Debris in the New Space Age, IB Docket 18-313

Dear Ms. Dortch:

On April 15, 2020, the Satellite Industry Association (SIA) met with Aaron Goldberger, legal advisor to Chairman Pai, by teleconference.

Attending the meeting for SIA, in addition to myself, were Therese Jones, SIA; Kalpak Gude, Amazon; Julie Zoller, Amazon; Raquel Noriega, AT&T; Audrey Allison, Boeing; Bruce Olcott, Jones Day, representing Boeing; Kim Baum, EchoStar Corporation; Jennifer Manner, EchoStar Corporation; Ethan Lucarelli, Inmarsat; Sue Crandall, Intelsat; Scott Kotler, Lockheed Martin; Mark Mozena, Planet; Adonica Wada, Planet; Kelsie Rutherford, SES; Suzanne Malloy, SES; Patricia Cooper, SpaceX; David Goldman, SpaceX; Michelle McClure, Spire; Mike Mineiro, HawkEye 360 and Joe Godles, Goldberg, Godles, Wiener & Wright LLP, representing Telesat. In the meeting, our presentation followed the attached talking points, which were distributed to the meeting attendees.

Please contact me should you have any questions.

Respectfully submitted,

SATELLITE INDUSTRY ASSOCIATION

By: */s/ Tom Stroup*

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Attachment

Cc:
Aaron Goldberger

Kalpak Gude
Julie Zoller
Raquel Noriega
Audrey Allison
Bruce Olcott
Kim Baum
Jennifer Manner
Ethan Lucarelli
Sue Crandall
Scott Kotler
Mark Mozena
Adonica Wada
Kelsie Rutherford
Suzanne Malloy
Patricia Cooper
David Goldman
Michelle McClure
Mike Mineiro
Joe Godles
Therese Jones

Satellite Industry Association
FCC Draft Order and FNPRM on Orbital Debris Mitigation

- The Satellite Industry Association ("SIA")[1,2] is committed to responsible space operations to ensure a sustainable environment in space. SIA and its members are committed to working to develop industry best practices on space sustainability and to working across the U.S. government to collaborate on orbital debris mitigation; as such, SIA released its own series of Space Safety Principles in Fall 2019.[3]

- Thus, while supporting the broad objectives of the draft Order to mitigate risk of orbital debris, SIA urges the Commission to move the below items in the draft Order to an FNPRM for additional study. Consistent with its prior urging that the FCC engage in an interagency process to develop an integrated approach to orbital debris risk management, SIA recommends greater discussion between the Commission and the space community on the rationale for deviations from the U.S. Government Orbital Debris Mitigation Standard Practices and what, if any, role expert agencies would have in the "case by case" approach in the order.

- The draft Order includes new compliance rules for satellites that are much more aggressive than the standards employed by other expert federal agencies and will greatly increase costs for U.S. licensed satellite operators, in some cases beyond what is reasonably achievable.

- The draft rules conflict with the Administration and Commission's goal of reducing regulatory restrictions to promote the growth of the U.S. communications and space industries. [4]

- The draft order includes numerous new information disclosure requirements regarding proposed satellite systems, without establishing transparent or objective thresholds regarding the level of compliance that would be sufficient to warrant the grant of a license.

    - The draft order uses the term "case-by-case" forty-four times to describe what would be an unprecedented grant of delegated authority to the bureau level.

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[1] SIA Executive Members include: Amazon; AT&T Services, Inc.; The Boeing Company; EchoStar Corporation; Intelsat S.A.; Iridium Communications Inc.; Kratos Defense & Security Solutions; Ligado Networks; Lockheed Martin Corporation; OneWeb; SES Americom, Inc.; Space Exploration Technologies Corp.; Spire Global Inc.; and Viasat Inc. SIA Associate Members include: ABS US Corp.; AIRBUS U.S. Space & Defense, Inc.; Amazon Web Services; Analytical Graphics, Inc.; Artel, LLC; Blue Origin; Eutelsat America Corp.; ExoAnalytic Solutions; Globalstar, Inc.; HawkEye 360; Hughes; Inmarsat, Inc.; Kymeta Corporation; Leonardo DRS; Lynk; Omnispace; OneWeb Satellites; Panasonic Avionics Corporation; Peraton; Planet; Telesat Canada; and XTAR, LLC.

[2] These comments are supported by all SIA members except for Ligado and Viasat, which do not support the views expressed in this document, and OneWeb, who abstains from participation.

[3] SIA Space Safety Principles, https://sia.org/policy/space-debris-mitigation-sustainability/

[4] *See*, e.g., Space Policy Directive-2, Section 1 that states "It is therefore important that regulations adopted and enforced by the executive branch promote economic growth; minimize uncertainty for taxpayers, investors, and private industry; protect national security, public-safety, and foreign policy interests; and encourage American leadership in space commerce."

New Compliance Requirements

- **Risk Standards.** The draft order diverges from accepted standards such as the U.S. Government Orbital Debris Mitigation Standard Practice and NASA-STD-8719.14B.
    - SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Collisions with Large Objects**. The rules require a demonstration that the risk of collision with large objects does not exceed 0.001 on a system-wide basis for all satellites.
    - The NASA standard is much more flexible, applying on a per-satellite basis.
    - The draft rules also require that one of the compliance demonstrations assumes that 10% of the satellites will malfunction and lose maneuverability, placing into question whether it would be possible to show compliance for a large NGSO system.
    - For larger systems, it may not be practical to meet 0.001 on a system wide basis, and addressing on a case-by-case basis means an operator would take the risk of making a large investment with no certainty on securing a license.
    - SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Casualty Risk**. The rules require zero risk of a human casualty resulting from the disposal of all satellites in an NGSO system (rather than per satellite) by atmospheric reentry.
    - The NASA standard permits a probability risk of 0.0001 per satellite.
    - The order suggests that a zero risk is achievable using a "design for demise" approach (meaning that all satellite components must incinerate during reentry).
        - Some components used in satellites may not fully incinerate during reentry.
    - While we agree that design for demise and aspiring to a calculated human casualty risk from surviving debris of zero is a goal all should aspire to meet, it should be clear that the NASA standard probability risk of 0.0001 per satellite is the minimum acceptable threshold.
    - SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Indemnification**. The rules require satellite operators to certify they will indemnify the U.S. government against costs associated with a claim under international law resulting from a spacecraft.
    - The FCC cites no statutory authority for requiring indemnification, stating only that imposing this obligation "strengthens the incentives of applicants to mitigate risks."
    - Imposition of a U.S. license condition requiring indemnification could lead to forum shopping -- encouraging entities to apply for licenses from foreign administrations to the detriment of the U.S. space industry.
    - The rule may be applied in "unusual circumstances" on a "case-by-case basis" to market access requests of foreign satellite operators, with limited guidance on relevant criteria. Such an approach is impermissibly vague and does not afford

foreign satellite operators sufficient clarity regarding obligations associated with proposed service to the U.S. market.

- The rule also provides no clear guidance on how large such an indemnification could be. This unlimited liability is very difficult for companies to plan for as well as being problematic for meeting required SEC disclosures and for planning purposes. Considering these issues, SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.
- The Commission has not fully evaluated important implications of this rule. The Commission should, at a minimum, ask additional questions as part of the FNPRM prior to adopting any indemnification requirement including:
  - Would imposing an indemnification requirement as a license condition impose new liability on U.S. space station licensees? Or, are existing civil action procedures currently available to the U.S. Government such that the indemnification requirement may be considered merely a procedural formality? If simply procedural in nature, does the availability of other procedural mechanisms obviate the need for this new Commission-imposed indemnification obligation?
  - What economic and administrative burdens would a U.S. indemnification requirement impose on U.S. entities, specifically those that are publicly traded?
  - What "standardized" language would be appropriate to implement an indemnification statement, if adopted, and shouldn't the language be subject to comment?
  - Should satellites in orbit or under construction as of November 15, 2018 be grandfathered, given that the decision to launch and operate was taken prior to having notice of the possibility of an indemnification requirement associated with its license?
  - Should there be a cap on a U.S. licensee's potential liability (financial and duration) under the proposed indemnification provision, and if so, what should it be?
  - If a liability is caused through no fault of the licensee would the licensee still be found responsible? Who would make that determination and under what standard?
  - Could the imposition of an indemnification statement on U.S. licensees make it less likely that the United States would vigorously defend against a claim brought against it under the Space Liability Convention?

New Information Disclosure Requirements

- **Maneuverability**. The rules require disclosure of the extent of maneuverability for satellites. The rules also require that space stations deployed above 400 km be designed with maneuvering capabilities sufficient to perform collision avoidance throughout the period when the space stations are above 400 km.
  - The draft Order declines to specify an acceptable number of avoidance maneuvers or identify any other minimum maneuverability requirement, such as distance over time, instead considering each technology on a case-by-case basis.

- Satellite operators therefore will have no objective or transparent standard regarding the extent of maneuverability required to secure license approvals of receiving a conjunction warning.
- The proposed review process effectively implies that non-propulsive maneuvering methods, such as differential drag, would no longer be permissible, eliminating the 3U cubesat form factor and smaller satellite designs. No viable propulsion options exist for 3U or smaller satellites.
- At a minimum, such drastic operational design changes require more than two years to complete. The proposed change, coupled with a two-year transitional period, would stifle established business plans and disrupt U.S. government contractual obligations.
- SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Deployment Devices**. The rules require disclosure of any use of satellite deployment devices during launch that are released separately from the satellite and launch vehicle.
  - The Commission acknowledged that such deployment devices can be beneficial in avoiding collisions between multiple satellites deployed in the same launch vehicle.
  - Deployment devices are commonly used for dual-GSO satellite launches and are the responsibility of the launch provider, not the satellite operator.
  - The rules indicate that the Commission will decide whether to permit such devices on a case-by-case basis without identifying any criteria for their permissible use, such as required number of years for disposal.
  - This approach can create unacceptable uncertainty or limitations in the choice of launch provider.
  - SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Accidental Explosion.** The rules maintain the Commission's existing requirement that satellite operators provide an assessment of the probability of accidental explosion.
  - The draft Order does not adopt the probability threshold endorsed by other federal agencies (the Government's Orbital Debris Mitigation Standard Practices) of 0.001.
  - The draft order instead adopts a case-by-case review process in which 0.001 would appear to be the ceiling, but no objective or transparent standard is provided. The rules should specify 0.001 per satellite as the ceiling.
  - SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Persistent Liquids.** The rules require the space station operator to assess and limit the probability that any liquids in satellites that, if released in space, would persist in droplet form rather than evaporate.
  - Other U.S. federal agency standards do not require such an evaluation of liquids on satellites.
  - The draft order includes no objective or transparent guidance on how this assessment will be judged or whether such liquids will be permitted, indicating only that they will be consider on a case-by-case basis.

- SIA urges the Commission to continue evaluating this complicated matter as part of the Further Notice.

- **Post-Mission Disposal Bond**. The draft includes a Further Notice of Proposed Rulemaking seeking to impose a significant performance bond on post-mission satellite disposal.
  - Regardless of precautions taken in the design and operation of a satellite, end-of-life disposal can be prevented by numerous factors beyond an operator's control.
  - If post-mission disposal fails, U.S. operators may incur a substantial additional cost (the Order references up to $100 million) on top of the loss of a valuable satellite.
  - Given the potential economic impact of such a bond and the wide range of factors that may prevent end-of-life disposal, the questions in Attachment A must be added to the language of the FNPRM to ensure a complete record.

Attachment A: Additional Questions for Orbital Debris FNPRM on Post-Mission Disposal Bond

- Are there other approaches than a bond that should be considered (e.g., corporate guarantee) and, if so, what are they? What are there pros and cons?
- What are the costs/benefits of this approach?
- What happens to the bond if there is an anomaly or if the planned disposal approach has to change for technical reasons out of the operator's control?
- What are other countries doing to ensure post-mission disposal?
- What will the impact of this requirement be on encouraging U.S. licensing of satellite systems?
- If there is no market access bond, how will that impact U.S. operators?
- The FCC's bond approach for licensing is much shorter – here we are talking about 15+ years – are there different issues that need to be considered?
- What happens if ownership of the satellite/license changes over time?
- If this applies to both market access and U.S. licensed systems, how will this impact the availability of satellite services in the United States?
- Is there an impact on U.S. innovation from such an approach?
- Is there supporting evidence to justify doubling the bond for extending a GSO satellite's license beyond 15 years? Similarly, is there evidence to support significant increases for each year beyond 20?