

**Before the
Federal Communications Commission
Washington, D.C. 20554**

In the Matter of)
)
Mitigation of Orbital Debris in the New Space Age) IB Docket No. 18-313

COMMENTS OF SES AMERICOM, INC. AND O3B LIMITED

SES Americom, Inc. and its affiliate O3b Limited (collectively, “SES”) submit these comments regarding the Notice of Proposed Rulemaking in the above-captioned proceeding, which seeks input on a variety of proposals for revisions to Commission rules governing mitigation of orbital debris.¹ SES has decades of experience as a space station operator, and its fleets include both geostationary orbit (“GSO”) and non-geostationary orbit (“NGSO”) spacecraft, giving it a unique perspective on the issues raised in the Notice.

SES also has a strong and long-standing commitment to preserving safe access to space. SES joined with Inmarsat and Intelsat in 2009 to found the Space Data Association (“SDA”), a not-for-profit association formed by and for satellite operators to provide reliable and efficient data sharing critical to the safety and integrity of the space environment.² The SDA, which is open to all satellite operators, established the Space Data Center (“SDC”), a platform that uses flight dynamics data provided by member companies and information regarding space objects from other available sources to provide conjunction assessment and warning services through a highly secure, reliable, and efficient information sharing interface. The investment by SES and others in the SDA highlight private sector efforts to promote best practices and prevent debris events that could compromise safe satellite operations.

¹ *Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rulemaking, FCC 18-159 (rel. Nov. 19, 2018) (“Notice”).

² See <http://www.space-data.org/sda/>.

As a member of the Satellite Industry Association (“SIA”), SES fully supports the comments SIA is submitting in this proceeding and focuses here on issues not addressed in the SIA filing. As discussed below, SES endorses a number of the specific rule revisions set forth in the Notice but urges the Commission to clarify and modify its proposals in certain respects to provide greater certainty and uniformity in its rules.

I. THE RISK OF MANEUVERABLE SATELLITES COLLIDING WITH LARGE OBJECTS SHOULD BE ASSUMED TO BE ZERO

For NGSO satellites, the Notice proposes to add a risk quantification provision to the existing Commission rule requiring applicants to describe how they have assessed and limited the probability that their spacecraft will collide with a large object.³ In connection with this proposal, the Commission asks whether “if a spacecraft’s orbital debris mitigation plan includes maneuvering to avoid collisions, we should, consistent with current licensing practice, consider this risk to be zero or near zero during the period of time in which the spacecraft is maneuverable, absent contrary information.”⁴

If the Commission adopts the proposed risk quantification requirement, SES strongly urges the Commission to incorporate the current presumption that the risk is effectively zero for operators able to maneuver their spacecraft to avoid a collision. SES, for example, uses the SDC system to monitor the risk of close approach of its satellites with other objects. Any predicted close encounters are investigated in more detail, and avoidance maneuvers are performed as needed to eliminate the possibility of collisions. These practices have proven to be extremely

³ See Notice at ¶ 26 and proposed § 25.114(d)(14)(iv)(A)(1).

⁴ See *id.* at ¶ 26.

effective in maintaining the necessary separation to prevent collision with large debris and other satellites.

II. SES SUPPORTS REQUIRING ALL NGSO APPLICANTS TO ADDRESS THE RISK OF COLLISION WITH OTHER SATELLITES

The Commission should adopt its proposal to extend to all NGSO satellite applicants its existing rule requiring the identification of any other satellites using or proposing to use a similar orbit and disclosing the coordination measures that will be taken to address collision risk.⁵ As the Notice recognizes, the current language of Section 25.114(d)(14)(iii), which is limited to applications proposing satellites that will be in low-Earth orbit (“LEO”), is underinclusive, as it ignores the collision risks that could arise if an applicant for an NGSO system outside the LEO region plans to use an orbit that is identical or similar to that of another system. The rule change proposed by the Commission will cure this defect by requiring all NGSO applicants to describe whether their requested orbit is in use by another system and if so, how the applicant will ensure that its satellites do not pose a collision risk to that system.

SES also supports the proposal in the Notice to mandate that applicants seeking NGSO authority detail their systems’ maneuverability characteristics.⁶ Such information is relevant for the Commission to assess the effectiveness of the orbital debris mitigation plan and for other operators to understand any constraints on the applicant’s ability to adjust satellite positioning in the event of a conjunction warning.

⁵ *Id.* at ¶ 28 and proposed § 25.114(d)(14)(iv)(A)(2).

⁶ *Id.* at ¶ 39 and proposed § 25.114(d)(14)(iv)(A)(3).

III. THE COMMISSION SHOULD ADOPT AND EXPAND ITS PROPOSALS FOR FACILITATING ORBIT RAISING OF NGSO SPACECRAFT

SES supports the Commission's proposals to revise its rules to allow NGSO systems as well as GSO systems to rely on streamlined procedures relating to the use of telemetry, tracking, and command ("TT&C") functions for orbit-raising during the pre-operational phase,⁷ but the Commission should extend these provisions to NGSO orbit-raising following the completion of mission operations as well. The Notice focuses on Section 25.282, which currently authorizes TT&C operations to support post-launch orbit raising of GSO spacecraft on an unprotected, non-interference basis.⁸ Under the proposed changes, TT&C operations by NGSO satellites would be permitted during the post-launch phase as well, and for both GSO and NGSO systems, the TT&C operations would be entitled to interference protection provided they were coordinated. SES fully endorses these revisions.

SES asks the Commission to extend the same treatment to TT&C operations needed to support orbit-raising of NGSO spacecraft at the end of the satellite's mission. For GSO spacecraft, such authority is conferred in Section 25.283(b), which permits the use of authorized TT&C frequencies for orbit-raising maneuvers at the end of the satellite's useful life subject to a coordination condition and provided that the spacecraft is being raised to an altitude that complies with Commission standards in Section 25.283(a).⁹ The Commission should revise Section 25.283 or broaden the scope of Section 25.282 to similarly authorize NGSO satellites to perform TT&C functions on a coordinated basis to support relocation of spacecraft to a disposal orbit as contemplated by the NGSO system's orbital debris mitigation plan.

⁷ *Id.* at ¶¶ 70-71 and proposed revisions to § 25.282.

⁸ 47 C.F.R. § 25.282.

⁹ 47 C.F.R. § 25.283.

IV. AMATEUR AND EXPERIMENTAL NGSO SATELLITES SHOULD NOT RECEIVE A BLANKET EXEMPTION FROM THE REQUIREMENT TO PROVIDE EPHEMERIS DATA

Finally, SES supports the Commission’s proposals regarding obligations for commercial NGSO satellites to maintain and share ephemeris data,¹⁰ but does not agree that amateur and experimental NGSO satellites should necessarily be exempted from such requirements.¹¹ The same rationale for adopting the requirements in the commercial context – to “ensure compatible operations of NGSO FSS constellations” given that “knowledge of the physical locations of NGSO FSS satellites is an essential element of spectrum sharing”¹² – extends to amateur and experimental satellites as well. In contrast, the fact that amateur and experimental authorizations “do not typically involve many satellites”¹³ does not support a blanket exemption. The need for exchange of ephemeris data regarding amateur and experimental systems will depend significantly on the parameters of the proposed operations, including the number of satellites, the duration of the mission, and the orbital region selected. SES therefore urges the Commission to adopt rules specifying that amateur and experimental NGSO satellite applicants should be required to maintain and share ephemeris data unless the applicant demonstrates that such requirements are unwarranted given the specific characteristics of the proposed mission.

¹⁰ Notice at ¶ 73 and proposed § 25.271(e).

¹¹ *Id.* at ¶ 84.

¹² *Id.* at ¶ 72.

¹³ *Id.* at ¶ 84.

V. CONCLUSION

For the foregoing reasons, SES respectfully requests that the Commission modify the proposals in the Notice as described herein to provide a clear and reasonable framework for addressing orbital debris matters.

Respectfully submitted,

SES AMERICOM, INC.

By: /s/ Petra A. Vorwig
Senior Legal and Regulatory Counsel
1129 20th Street, NW
Suite 1000
Washington, DC 20006

April 5, 2019

O3b LIMITED

By: /s/ Suzanne Malloy
Vice President of Regulatory Affairs
1129 20th Street, NW
Suite 1000
Washington, DC 20006