

**Before the
Federal Communications Commission
Washington, DC 20554**

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

REPLY COMMENTS OF EUTELSAT S.A.

Eutelsat S.A. (“Eutelsat”) submits these Reply Comments on the Federal Communications Commission (“FCC” or “Commission”) notice of proposed rulemaking (“NPRM”) seeking to adopt new rules governing orbital debris mitigation for geostationary satellite orbit (“GSO”) and non-geostationary satellite orbit (“NGSO”) systems.¹ Eutelsat operates a global GSO satellite fleet with substantial operations in the United States. Eutelsat welcomes the Commission’s efforts to address these issues and the opportunity to provide its further input in this proceeding, but continues to urge caution with respect to well-settled principles applicable to GSO satellites.

In addition to the matters highlighted in its initial Comments,² Eutelsat addresses the following specific issues in these Reply Comments:

- the Commission should clarify its proposal to require “coordination” during launch and orbit raising operations;
- the Commission should not impose a satellite end-of-life bond requirement;
- the Commission should exhibit caution in interpreting interested party comments and applying proposed requirements to GSO satellites; and
- the Commission should not regulate the specifics of GSO satellite design.

¹ See *Mitigation of Orbital Debris in the New Space Age*, Notice of Proposed Rulemaking, FCC 18-159, IB Docket No. 18-313 (rel. Nov. 19, 2018) (the “NPRM”).

² See Comments of Eutelsat S.A., IB Docket No. 18-313, (filed April 5, 2019) (“Eutelsat Comments”).

I. DISCUSSION

Orbital debris is a persistent global problem and Eutelsat appreciates the Commission's efforts to address this issue, as do the many other commenters in this proceeding. Eutelsat has already noted that the Commission should focus on orbital debris issues associated with the proliferation of NGSO satellites and constellations. GSO satellite orbital debris mitigation issues are well-settled and based upon internationally agreed principles, and additional requirements could put at risk already agreed GSO orbital debris mitigation approaches.

A. The Commission Should Clarify its "Coordination" Requirement

In the NPRM, the Commission seeks comment on revising their "existing rule regarding orbit raising maneuvers to require coordination of such operations to avoid interference events."³ The word "coordination," and the phrase "coordinated on an operator-to-operator basis with any potentially affected satellite networks" in the Commission's proposed rule,⁴ may be subject to misinterpretation because it is often used to refer to a formal procedure under International Telecommunication Union ("ITU") regulations, although the term is not defined in the NPRM.

Current practice involves discussions between operators to facilitate operations on a non-interference basis. Such discussions are not subject to the formal ITU coordination or similar process but have proven their effectiveness and efficiency. Eutelsat welcomes Commission intent to stimulate discussion between operators and requests that the Commission clarify that orbit-raising coordination will remain an informal process and provide guidance on any specific requirements that it may contemplate in the context of operator-to-operator discussions.

³ See NPRM at ¶71.

⁴ See NPRM at Appendix A (proposed Section 25.282).

Eutelsat also notes that there may be a significant time gap between grant of a license or market access (up to five years before the launch) and operator-to-operator discussions associated with orbit-raising (generally occurring a short time before launch). Commission guidance should include any proposed timing considerations, as well as allowances for market access requests from foreign-licensed satellite operators that may have unique timing considerations (*e.g.*, a launch window closer to or even before a market access grant date than typically contemplated).

B. An End-of-Life Bond Should Not Be Required

In the NPRM, the Commission explores economic incentives to address liability issues associated with orbital debris and satellite end-of-life issues. Among other things, the NPRM asks: “Would, for example, a bond requirement, similar to our performance bond for satellite deployment but applied with respect to successful completion of end of life disposal, provide such an incentive?”⁵ Eutelsat respectfully opposes such a requirement.

Although the theoretical concept of requiring a performance bond (which would be released upon successful de-orbiting or placement into graveyard orbit) may appear to be a potential means to compel better orbital debris mitigation practices, the issue is very different from the Commission’s other use of performance bonds in the satellite context (ensuring authorized satellite system implementation and preventing spectrum and orbital slot warehousing) and – at least for GSO satellites – the costs would outweigh any potential benefits of such an approach.

⁵ See NPRM at ¶81.

First, the Commission's rules require that a performance bond be posted for the period between grant of a satellite license or market access authority and bringing into use.⁶ Among other things, this requirement serves to incentivize authorized satellite implementation, to avoid spectrum and orbital resources from laying fallow, and to minimize the adverse consequences of authorized but unbuilt satellite facilities. A performance bond requirement in this context is essentially within the proponent's control and there is a direct correlation between the proponent's efforts and implementation of the authorized satellite. In contrast, satellite end-of-life anomalies are typically a result of unanticipated events that occur despite a proponent's best effort, and collection under a performance bond does not mitigate the results of such anomalies (*i.e.*, the anomalous spacecraft or debris remains a risk despite the bond).

Second, the cost and complexity of obtaining and maintaining satellite end-of-life bonds may be prohibitive. It would be difficult for a commercial provider to create a performance bond whose life could be fifteen years, or even longer, to address unexpected events during a period with no defined end date (because satellites can remain in operation for many years beyond their initial design lifetimes). Further, in most cases, significant capital will be tied up for a long period of time to cover the bond, in addition to the annual bond fees, which would either be wasted if the satellite is successfully de-orbited, or forfeited with no mitigation of any increased collision risk.

Given the high cost and complexity of performance bonds in the orbital debris/satellite end-of-life context, and their inability to directly mitigate such issues, imposition of a bond requirement would not be a feasible and effective means of mitigating orbital debris.

⁶ See 47 C.F.R. §25.165.

C. Commenters and the Commission Should Distinguish Between GSO and NGSO Proposals

The Commission should be cautious in its reading of comments so that proposals aimed at NGSO satellites are not improperly applied to GSO satellites. Eutelsat notes that some comments may be limited to NGSO satellites but could be interpreted otherwise. For example, it is not clear whether SpaceX's suggestion that: "[o]perators should limit their satellites' time on orbit following the end of their mission lifetime"⁷ is limited to NGSO satellites or whether "mission lifetime" means design lifetime, license period, or actual operational life (which may extend beyond both design lifetime and license period), or "on orbit" means operational orbit and excludes cemetery orbit for GSO. In other cases, use of the term "de-orbit" in connection with satellite end-of-life is not specific to NGSO systems.⁸

If applied to GSO satellites, such statements could potentially mean either (i) limiting or prohibiting license extensions despite additional operational capabilities; or (ii) requiring an operator to bring a GSO back to Earth rather than placing it in the graveyard orbit above the geostationary arc. Of course, neither of these results is practical or in the public interest.

Although the NPRM appears to be driven primarily by orbital debris and satellite end-of-life concerns applicable to NGSO satellites, it plainly includes GSO considerations as well, and some areas of the NPRM are not specific as to which type of satellite they address. Furthermore, many of the commenters in the proceeding are NGSO system proponents that understandably focus on the NGSO issues raised in the proceeding. Eutelsat simply seeks to ensure the NGSO-

⁷ See Comments of Space Exploration Technologies Corp. ("SpaceX"), IB Docket No. 18-313 (filed April 5, 2019) at i, 5.

⁸ See Comments of ORBCOMM, Inc., IB Docket No. 18-313 (filed April 5, 2019).

related proposals and comments are not inappropriately included in new Commission rules that cover GSO satellites.

D. The Commission Should Not Impose Specific Satellite Design Requirements

In Section III.I of the NPRM (Regulatory Impact Analysis), the Commission suggests: “[a]nother method of reducing orbital debris would be for the Commission to regulate how satellites or satellite systems are designed.”⁹ It is not clear whether the proposal is limited to NGSO satellites¹⁰ and Eutelsat respectfully opposes this suggestion with respect to GSO satellites.

The Commission has long avoided getting into the equipment design business and instead adopted technical and operational requirements that may be implemented with a range of technologies and equipment designs.¹¹ The same approach should be applied to orbital debris and end-of-life considerations for spacecraft.¹²

Regulation of spacecraft design could inhibit innovation and competition by manufacturers regarding ways to limit orbital debris, improve satellite operations, and ensure reliable end-of-life operations. The Commission should avoid micromanagement and set performance objectives but not the specific means to reach these objectives. Also, given rapid advancements in satellite technology, it may be difficult to identify a meaningful list of design elements that should be limited by rule and frequently updated to reflect technological progress.

⁹ See NPRM at ¶93.

¹⁰ Much of Section III.I of the NPRM, and paragraph 93 itself, appears focused on NGSO satellites but this is not entirely clear from the text.

¹¹ Indeed, the NPRM itself recognizes this truism. See NPRM at ¶10 (“In some areas where we have proposed general disclosures in lieu of specific design or operational requirements, we believe such disclosures will provide flexibility for us to address ongoing developments in space station design and other technologies.”).

¹² See Mitigation of Orbital Debris, Second Report and Order, IB Docket No. 02-54, FCC 04-130 (rel. June 21, 2004) at ¶¶27-28.

In view of the complexity of satellite systems, spacecraft reliability should be viewed holistically based on technologies and designs available in the marketplace rather than mandating or prohibiting individual design elements or components. This approach has served the industry and the Commission well for decades, particularly for GSO satellites. To the extent the Commission is focused on NGSO satellites or cubesats, the same principles may apply but Eutelsat takes no position on this issue.

Eutelsat notes that foreign satellite operators generally are subject to extensive and effective regulation of orbital debris and satellite end-of-life issues, including with respect to satellite design and operation. The Commission should avoid unnecessarily regulating areas where there is well-settled international consensus and well-accepted and well-understood industry design practices, as is the case with GSO satellite manufacturing. This is particularly true in the case of in-orbit satellites that seek U.S. market access, but also applies to other foreign-licensed satellite even in the earliest stages of design.

Finally, as it does today, the Commission can review satellite designs in the context of application and market access proceedings. This review can include issues within its public interest mandate and can address problematic design elements, including those elements that may be so objectionable or risky as to require denial, in the context of specific satellite applications and market access petitions filed with the Commission.¹³

III. CONCLUSION

Eutelsat appreciates the Commission's examination of orbital debris mitigation and satellite end-of-life issues, especially in the context of new NGSO satellite operations, but emphasizes that any modification of well-settled GSO satellite rules should be well-supported by

¹³ See *id.*, at ¶28.

specific requirements and must demonstrably serve the public interest. In particular, Eutelsat requests that the Commission (i) continue to allow informal operator-to-operator coordination during orbit-raising operations; (ii) not require a performance bond to enforce satellite end-of-life requirements; (iii) carefully distinguishing between GSO and NGSO satellites in interpreting interested party comments and adopting new orbital debris mitigation and satellite end-of-life requirements; (iv) avoid regulating satellite designs, particularly for GSO satellites.

Respectfully submitted,

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