April 2, 2026

By Electronic Filing

Marlene H. Dortch, Secretary
Federal Communications Commission
45 L Street N.E.
Washington, D.C. 20554

Re: *Kuiper Systems, LLC, ICFS File No. SAT-MOD-20211207-00186*

Dear Ms. Dortch:

Amazon Leo[1] writes in response to SpaceX's letter regarding Amazon Leo's use of a 450 km orbit insertion altitude.[2] SpaceX's letter raises two primary issues: First, that Amazon Leo's use of insertion altitudes near 450 km is both unexpected and contrary to representations made to the Commission in licensing the Amazon Leo system; and second, that Amazon Leo's change in insertion altitude imposed heightened risks on SpaceX and other operators. The facts demonstrate that Amazon Leo launches to altitudes permitted under its license, has been transparent about its insertion altitudes with both the Commission and with SpaceX, and operates squarely within established industry safety standards. Further, Amazon Leo has already committed to long-term changes that will further mitigate conjunction risk.

Background. At the outset, SpaceX's objection to Amazon Leo departing from the precise insertion orbit described in its licensing materials—400 km—comes as a surprise. SpaceX itself has launched Amazon Leo's commercial satellites into an insertion altitude of 460 km. SpaceX did not raise the issue during its first launch of Amazon Leo satellites in July 2025 to this altitude, nor during two subsequent launches into the same insertion altitude. Nor did Amazon Leo conceal the change in its insertion altitudes from the Commission. In addition to explaining the change to Commission staff before making it, Amazon Leo has noted a mean insertion altitude of 450 km in multiple space safety reports filed with the FCC.[3]

Neither the Commission nor any other operator has raised concerns about Amazon Leo launching to these insertion altitudes. This is for good reason. As SpaceX's letter rightly notes, Amazon Leo's licensing materials refer to an insertion altitude "at or near 400 km."[4] The terms of Amazon Leo's authorization did not commit it to deploy in this specific insertion altitude—instead, Amazon Leo's license conditions

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[1] Kuiper Systems LLC (d/b/a "Amazon Leo") is a wholly owned subsidiary of Amazon.com Services LLC (collectively, "Amazon"). On November 13, 2025, Amazon replaced the Project Kuiper code name with Amazon Leo, its permanent brand for its satellite broadband network.

[2] Letter from David Goldman, Vice President, Satellite Policy, to Marlene Dortch, Secretary, FCC, ICFS File No. SAT-MOD-20211207-00186 (filed Apr. 1, 2026) ("SpaceX Letter").

[3] Letter from Catherine Kuersten, Senior Corporate Counsel, Kuiper Systems LLC, to Marlene H. Dortch, Secretary, FCC, ICFS File Nos. SAT-LOA-20190704-00057, SAT-MOD-20211207-00186, SAT-MOD-20210806-00095, SAT-AMD-20230329-00067, at 2 (filed June 30, 2025); Letter from Kalpak Gude, Head of Global Regulatory Affairs, to Marlene H. Dortch, Secretary, FCC, ICFS File Nos. SAT-LOA-20190704-00057, SAT-MOD20211207-00186, SAT-MOD-20210806-00095, SAT-AMD-20230329-00067, at 1 (filed Dec. 31, 2025).

[4] *See* SpaceX Letter at 1 (acknowledging that Amazon Leo's mitigation plan indicated insertion "at or near" 400 km) (quoting Amazon Orbital Debris Application, Technical Appendix at 12).

expressly contemplate some flexibility in adjusting parameters. For example, as SpaceX also points out, Amazon Leo's license requires that it "coordinate physical operations of spacecraft" with other operators in similar orbits.[5] This is precisely what Amazon Leo did here, coordinating its operations to, among other reasons, ensure maneuver reliability through ISS's altitude and to mitigate space safety risks caused by increased solar activity. Amazon Leo explained this safety-focused approach to SpaceX in coordination meetings long before launching production satellites into this altitude.

Amazon Leo is committed to safe operations in space. SpaceX next raises concerns about a heightened risk of collision caused by Amazon Leo's change in insertion orbit. SpaceX only began raising the issues described in its letter within the last several months, after lowering the altitude of its Starlink constellation to 475, 480, and 485 km (±30 km orbital tolerance), with satellites operating as low as 462 km at the equator. This adjustment placed SpaceX's satellites directly into the altitude range Amazon Leo uses for orbit insertion—creating the overlap from which SpaceX's concerns arise.

The issues raised by SpaceX do not involve violation of Commission rules or industry standards. Amazon Leo's launch and insertion parameters comply with industry standards and best practices. Amazon Leo uses the industry-standard 1E-5 conjunction risk threshold consistent with best practices adopted by both NASA and the FAA.[6] Amazon Leo has independently verified its risk posture with SpaceNav to ensure that the probability of collision remains within established industry standards.

Instead of applying the industry standard approach to measuring risk, SpaceX's assertions rely on internal risk models developed and used by SpaceX to support its automated guidance systems. Specifically, SpaceX's claim that Amazon Leo's operations exceed the Commission's threshold for unmitigated conjunctions relies on a risk measurement methodology that the Commission expressly rejected when evaluating Amazon Leo's orbital debris mitigation plans.[7] SpaceX's measurement of Amazon Leo's risk is also inconsistent with SpaceX and the Commission's position on measuring the risk associated with maneuverable satellites.[8]

Amazon Leo has nevertheless taken SpaceX's concerns and risk posture seriously, attempting to work with

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[5] *See id.* at 1 (citing *Modification of the Authorization for the Kuiper Systems LLC NGSO Satellite System*, Order and Authorization, 38 FCC Rcd. 1112, ¶ 47 (IB 2023)).

[6] *See* NASA Spacecraft Conjunction Assessment and Collision Avoidance Best Practices Handbook, *available at* https://nodis3.gsfc.nasa.gov/OCE_docs/OCE_51.pdf; 14 C.F.R. 450.169(a)(2) (establishing a similar standard under FAA regulations).

[7] Specifically, SpaceX's approach relies on a measurement of cumulative "residual risks." This methodology accounts for the residual risks left over after maneuvering to avoid a conjunction or encountering a conjunction potential too remote to trigger an avoidance maneuver. *See* SpaceX Letter at 2 (Even in the presence of these maneuvers, the risk from this insertion is estimated to considerably exceed the Commission's semi-annual reporting threshold of 1×10^{-5} for unmitigated conjunctions.). Finding that it may not "provide a reasonable measure of risk," the Commission expressly rejected this approach to measuring risk when evaluating Amazon Leo's orbital debris mitigation plans. *See Modification of the Authorization for the Kuiper Systems LLC NGSO Satellite System*, Order and Authorization, 38 FCC Rcd. 1112, ¶ 17 (IB 2023) ("The Commission has observed that calculations of residual risk based on collision probabilities as specified in conjunction warnings may not provide a reasonable measure of this residual risk, and may present an artifact of risk modeling methods rather than actual risks.").

[8] The cumulative risks measured by SpaceX involve fully maneuverable satellites, which both SpaceX and the Commission have long agreed accumulate no collision risk. *See, e.g., Space Exploration Holdings Request for Deployment and Operating for the SpaceX Gen2 NGSO Satellite System; Application for Authority for Modification of the SpaceX NGSO Satellite System*, Order and Authorization, DA 26-36, ICFS File Nos. SAT-LOA-20200526-00055 et al., at 14 n.85 (rel. Jan. 6, 2026) ("Satellites that can effectively maneuver are deemed to pose zero risk of collision under the Commission's rules, in the absence of evidence to the contrary.").

SpaceX to find mutually acceptable solutions. When it became clear that changing near-term Ariane launch parameters would cause multi-month delays, Amazon Leo proposed a solution that would maintain Amazon Leo's deployment schedule while still addressing SpaceX's concerns. SpaceX declined this proposal and has not proposed alternative solutions.

Even so, Amazon Leo has made significant operational changes in response to SpaceX's concerns. Working with Arianespace, Amazon Leo has committed to lowering its target insertion altitude, beginning with its fourth Ariane mission. Similarly, Amazon Leo is working with its other launch providers to determine if they can lower insertion altitudes without impacting Amazon Leo's schedule.

But these types of changes require substantial lead time. Launch vehicle providers generally require at least months—and typically one year—to retarget insertion altitude due to the complexity of final mission analysis, which encompasses trajectory analysis, coupled loads analysis, and integrated thermal analysis. Arianespace, for example, requires three to six months for final mission analysis when changing target orbit parameters. Amazon Leo began this process immediately upon learning of SpaceX's concerns and has worked diligently with its launch providers to implement changes as quickly as operationally feasible.

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Amazon Leo takes space safety seriously and has demonstrated that commitment through its compliance with industry standards, its proactive coordination with other operators, and its substantial investments in long-term solutions. Amazon Leo will continue to work constructively with SpaceX and other operators to ensure safe operations in orbit. However, the Commission should recognize that the current situation stems in significant part from SpaceX's own recent orbital adjustments, and that Amazon Leo has already taken meaningful steps to address the concerns those adjustments created.

Amazon Leo remains committed to continuing to work with SpaceX, other operators, and the Commission to ensure safe operations in space.

Respectfully submitted,

/s/ Michael J. Carlson

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Amazon Leo,
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