

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554**

In the Matter of

Kuiper Systems LLC

Application for Modification of
Authorization to Launch and
Operate a Non-Geostationary
Satellite Orbit System in Ka-Band
Frequencies

Call Sign S3051

File No. SAT-MOD _____ -

APPLICATION FOR MODIFICATION

Kuiper Systems LLC (“Kuiper”), a wholly owned subsidiary of Amazon.com Services LLC (collectively “Amazon”), respectfully asks that the Federal Communications Commission (“Commission”) find that Amazon has satisfied Condition 64 of its license by submitting an updated orbital debris mitigation plan in the attached Technical Appendix.¹

I. INTRODUCTION AND BACKGROUND

On July 30, 2020, the Commission authorized Amazon to deploy a 3,236 satellite non-geostationary satellite orbit system to provide service using certain Fixed-Satellite Service and

¹ See *In re Kuiper Systems LLC, Application for Authority to Deploy and Operate a Ka-band Non-Geostationary Satellite Orbit System*, Order and Authorization, 35 FCC Rcd 8324 (2020) (“*Kuiper System Authorization*”). Amazon has filed the instant request for modification electronically as an attachment to FCC Form 312, along with a Technical Appendix (which includes an updated orbital debris mitigation plan, see Technical Appendix at 1 n.1.), Exhibit A, and Exhibit B. See 47 C.F.R. § 25.117(c), (d)(1). A previous modification filed by Amazon remains pending. See Kuiper Systems LLC, SAT-MOD-20210806-00095 (filed Aug. 6, 2021). To the extent not otherwise indicated or reflected in this application or Amazon’s pending modification, Amazon certifies that the information previously provided to the Commission in Amazon’s original application is unchanged and incorporated by reference. See 47 C.F.R. § 25.117(c).

Mobile-Satellite Service Ka-band frequencies (the “Kuiper System”).² As the basis for that authorization, the Commission determined Amazon’s system would serve the public interest by expanding the availability of high-speed broadband.³ Since then, Amazon has committed to invest at least \$10 billion to support Kuiper, and it continues to advance toward its goal of providing affordable, reliable, high-quality connectivity to customers and communities around the world. In October, Amazon announced a partnership with Verizon to extend connectivity services to rural and remote customers across the United States,⁴ and in early November, Amazon submitted plans to launch and deploy two prototype satellites by Q4 2022.⁵ The prototype missions will launch on an all-new rocket from ABL Space Systems, which joins United Launch Alliance on our roster of confirmed launch providers. Also in early November, Amazon submitted an application to launch and operate a Low Earth Orbit satellite system utilizing V-band and Ku-band frequencies.⁶ Amazon continues to expand its capabilities with more than 240,000 square feet of research and development facilities, and more than 750 employees on the growing Kuiper team.

When the Commission granted the *Kuiper System Authorization*, it conditioned the authorization on Amazon presenting, and the Commission approving, a modification of this authorization that presented the Commission with an updated description of the final orbital debris

² See generally *Kuiper System Authorization*, 35 FCC Rcd 8324. In this modification application, the term “Kuiper Satellites” refers to the satellites authorized by the Commission pursuant to the *Kuiper System Authorization*.

³ See *Kuiper System Authorization*, 35 FCC Rcd at 8326 ¶ 9.

⁴ See Press Release, Verizon, *5G + LEO: Verizon and Project Kuiper Team Up to Develop Connectivity Solutions* (Oct. 26, 2021) <https://www.verizon.com/about/news/5g-leo-verizon-project-kuiper-team>.

⁵ *Kuiper Systems LLC*, File No. 0956-EX-CN-2021 (filed Nov. 1, 2021).

⁶ *Kuiper Systems LLC*, File No. SAT-LOA-20211104-00145 (filed Nov. 4, 2021).

mitigation plan for the Kuiper System.⁷ The Commission explained that this updated plan should address in greater detail the collision risk for the system as a whole (including consideration of the reliability of post-mission disposal and the effect of failed satellites on risk) and re-entry casualty risk.⁸

As part of this application for modification, Amazon now submits an updated orbital debris mitigation plan that addresses the Commission's request for additional information, including system parameters and orbital debris mitigation measures with respect to Amazon's satellite design.⁹ This plan demonstrates that space safety is fundamental to Amazon, and that its satellite design and operational strategies will mitigate orbital debris risks, as required by Section 25.114(d)(14) of the Commission's rules. Specifically, the plan shows, among other things, that Amazon has 1) assessed and limited both the amount of debris released in a planned manner during normal operations and the probability that its satellites will become a source of debris by collisions with small debris or meteoroids that could cause loss of control and prevent post-mission disposal;¹⁰ 2) assessed and limited the probability, during and after completion of mission operations, of accidental explosions;¹¹ 3) assessed and limited the probability that its satellites will become a source of debris by collision with large debris or other operational space stations;¹² and 4) detailed the post-mission disposal plans

⁷ See *Kuiper System Authorization*, 35 FCC Rcd at 8333 ¶ 32, 8345 ¶ 64. Specifically, the Commission ordered Amazon to, "upon finalization of its space station design and prior to initiation of service, . . . seek and obtain the Commission's approval of a modification containing an updated description of the orbital debris mitigation plans for its system." *Id.* at 8345 ¶ 64.

⁸ See *id.* at 8333 ¶ 32 & n.74.

⁹ See *Technical Appendix*. The Kuiper Satellite design is complete, and Amazon does not expect it to change in material respects.

¹⁰ See 47 C.F.R. § 25.114(d)(14)(i); *Technical Appendix* at 2.

¹¹ See 47 C.F.R. § 25.114(d)(14)(ii); *Technical Appendix* at 6.

¹² See 47 C.F.R. § 25.114(d)(14)(iii); *Technical Appendix* at 7.

for its satellites at end of life, and provided a casualty risk assessment.¹³ Amazon’s operational orbit selection broadly ensures passive reentry and debris mitigation. Its strategy for rapid post-mission disposal and design for demise approach proactively minimizes debris generation.

II. GRANT OF THIS APPLICATION TO MODIFY THE KUIPER SYSTEM AUTHORIZATION IS CONSISTENT WITH THE COMMISSION’S RULES BECAUSE AMAZON IS QUALIFIED TO OPERATE ITS SATELLITE SYSTEM AND GRANT OF THE MODIFICATION WOULD BENEFIT THE PUBLIC.

Section 25.117 of the Commission’s rules states that applications for modification will generally be granted unless doing so would make the applicant unqualified to operate a space station, or would not serve the public interest, convenience, and necessity.¹⁴ Amazon has demonstrated that it is qualified to operate its constellation of satellites. And granting the requested modification is clearly in the public interest because it will allow Amazon to move forward and execute its plans to deploy its Kuiper constellation. Indeed, when the Commission originally authorized the Kuiper System subject to certain requirements and conditions, it “conclude[d] that grant of Kuiper’s application would advance the public interest” because it was “designed to increase the availability of high-speed broadband service to consumers, government, and businesses.”¹⁵ The same public interest considerations that supported grant of the original application support granting this modification now.

Because Amazon has now submitted its updated orbital debris mitigation plan, a finding that Amazon has satisfied Condition 64 will move Amazon closer to delivering affordable, reliable, high-quality connectivity to tens of millions of consumers and businesses across the globe, including in rural and hard-to-reach areas of the United States. Full authorization will also accelerate Amazon’s efforts to bring connectivity to enterprise customers, enabling growth in local economies, improving access to government services, and supporting public safety and disaster relief communications.

¹³ See 47 C.F.R. § 25.114(d)(14)(iv); Technical Appendix at 14.

¹⁴ See 47 C.F.R. § 25.117(d)(1), (2).

¹⁵ *Kuiper System Authorization*, 35 FCC Rcd at 8324 ¶ 3.

III. CONCLUSION

For the foregoing reasons, Amazon respectfully requests modification of the *Kuiper System Authorization* to find that Amazon has satisfied Condition 64.

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