

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

In the Matter of	)	
	)	
Kuiper Systems LLC	)	Call Sign S3051
	)	
Application for Modification of	)	File No. SAT-MOD-_____
Authorization for the Kuiper System	)	
	)	
	)	

APPLICATION FOR MODIFICATION

Kuiper Systems LLC (“Kuiper”), a wholly owned subsidiary of Amazon.com Services LLC (collectively “Amazon”), pursuant to Section 25.117 of the rules of the Federal Communications Commission (“FCC” or “Commission”),¹ hereby requests modification of its authorization to operate a non-geostationary satellite orbit (“NGSO”) fixed-satellite service (“FSS”) constellation (the “Kuiper System”) to reflect revised orbital parameters, and to slightly reduce its number of authorized satellites from 3,236 to 3,232.² This application (the “Modification Application”) describes the modified orbital parameters and demonstrates that authorizing this modification would serve the public interest. Technical information in support of the Modification Application is provided in FCC Form 312, Schedule S, and the Technical Appendix.³

¹ 47 C.F.R. § 25.117.

² See *Kuiper Systems, LLC Request for Modification of the Authorization for the Kuiper NGSO Satellite System*, Order and Authorization, DA 23-114 (rel. Feb. 8, 2023) (“*Kuiper Orbital Debris Modification Authorization*”).

³ To the extent not otherwise indicated or reflected in this application or Amazon’s pending applications for modifications, as supplemented, see Application for Modification of Kuiper Systems LLC, IBFS File No. SAT-MOD-20210806-00095 (filed Aug. 6, 2021), Application for Modification of Kuiper Systems LLC, IBFS File No. SAT-MOD-20230201-00013 (filed Feb. 1,

I. INTRODUCTION.

On July 30, 2020, the Commission authorized Amazon to deploy the Kuiper System, a 3,236-satellite NGSO system to provide service using certain FSS and Mobile-Satellite Service (“MSS”) Ka-band frequencies.⁴ As the basis for that authorization, the Commission determined that Amazon’s system would expand the availability of high-speed broadband, thus serving the public interest.⁵ Since then, Amazon has invested more than \$10 billion to support Project Kuiper, and Amazon continues to advance toward its goal of providing affordable, reliable, high-quality connectivity to customers and communities around the world. For example, Amazon has invested in state-of-the-art facilities, including a 219,000-square-foot facility in Redmond, Washington for research and development, prototype manufacturing, and qualification; and a dedicated 172,000-square-foot satellite-production facility in Kirkland, Washington.⁶ And, Amazon has secured up to 83 heavy-lift satellite-launch vehicles from three commercial providers, in addition to ridesharing arrangements and the nine Atlas V launch vehicles purchased in 2021.⁷

2023), Amazon certifies that the information previously provided to the Commission as part of Amazon’s most recent modification, *see* Application for Modification of Kuiper Systems LLC, IBFS File No. SAT-MOD-20211207-00186 (filed Dec. 7, 2021) (“Kuiper Orbital Debris Modification Application”), is unchanged and incorporated by reference. *See* 47 C.F.R. § 25.117(c).

⁴ *See 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*”). The FCC granted modification of the Kuiper System on February 8, 2023. *See Kuiper Orbital Debris Modification Authorization*.

⁵ *Id.* ¶ 9.

⁶ *Amazon Expands Satellite Manufacturing at Newly Acquired Project Kuiper Facility*, Amazon (Oct. 27, 2022), <https://bit.ly/3PCsWMS>.

⁷ *Amazon’s Project Kuiper Satellites Will Fly on the New Vulcan Centaur Rocket in Early 2023*, Amazon (Oct. 12, 2022), <https://bit.ly/3I4j8K7>.

With this Modification Application, Amazon seeks authority to reconfigure the distribution of its satellites within the orbital planes of each of the Kuiper System orbital shells, as summarized in Table 1 below. The phasing between satellites and planes in each shell are also being modified as described in Schedule S.

Table 1. Modified Orbital Parameters

Orbital Shell		Original Kuiper System			Modified Kuiper System		
Altitude (km)	Inclination (deg)	Orbital Planes	Satellites per Plane	Total Satellites	Orbital Planes	Satellites per Plane	Total Satellites
630	51.9	34	34	1156	289	4	1156
610	42	36	36	1296	1292	1	1292
590	33	28	28	784	782	1	782
590	30	0	0	0	1	2	2
Total				3236			3232

The proposed modification to the Kuiper System does not change the altitude or radiofrequency characteristics of any satellite and decreases the number of satellites to 3,232. Amazon will also update the International Telecommunication Union filings associated with the Kuiper System.⁸

II. GRANT OF THE MODIFICATION APPLICATION WILL ACCELERATE DEPLOYMENT OF THE KUIPER SYSTEM AND EXPAND THE AVAILABILITY OF HIGH-QUALITY BROADBAND SERVICE.

Under Section 25.117 of the Commission’s rules, modification requests “will be granted” unless doing so would make the applicant unqualified to operate a space station or “[g]ranteeing the modification request would not serve the public interest, convenience, and necessity.”⁹ Amazon

⁸ See USASAT-NGSO-8A: CR/C/5024, IFIC No. 2904 published 17.09.2019; CR/C/5024 MOD-1, IFIC No. 2962 published 11.01.2022; CR/C/5024 MOD-2, IFIC No. 2987 published 10.01.2023; USASAT-NGSO-8B: CR/C/5025, IFIC No. 2904 published 17.09.2019; CR/C/5025 MOD-1, IFIC No. 2962 published 11.01.2022; CR/C/5025 MOD-2, IFIC No. 2987 published 10.01.2023; USASAT-NGSO-8C: CR/C/5026, IFIC No. 2904 published 17.09.2019; CR/C/5026 MOD-1, IFIC No. 2962 published 11.01.2022; CR/C/5026 MOD-2, IFIC No. 2987 published 10.01.2023.

⁹ 47 C.F.R. § 25.117(d)(2)(ii).

has demonstrated that it is qualified to operate its constellation of satellites. And when the Commission originally authorized the Kuiper System, it “conclude[d] that grant of Kuiper’s application would advance the public interest” because the Kuiper System was “designed to increase the availability of high-speed broadband service to consumers, government, and businesses.”¹⁰ The same public interest considerations that supported grant of the original space station application and Kuiper’s updated orbital debris mitigation plan support granting this Modification Application. Based on Amazon’s experience and innovation in the years since it filed the original Kuiper System application,¹¹ the revised orbital design proposed here will improve customer coverage, and accelerate the timeline for extending the availability of intended services over the full $\pm 56^\circ$ latitude band. Moreover, the proposed orbital design accomplishes these goals while maintaining sufficient separation between the satellites at all deployment stages to help ensure space safety.¹² Grant of this Modification Application will allow Amazon’s Kuiper System to deliver satellite broadband communications services to tens of millions of unserved and

¹⁰ *Kuiper System Authorization* ¶ 3.

¹¹ *See* Application of Kuiper Systems LLC for Authority to Deploy and Operate a Ka-band Non-Geostationary Satellite Orbit System, IBFS File No. SAT-LOA-20190704-00057 (filed July 4, 2019).

¹² The Kuiper System, as modified by this application, will maintain the same altitude and inclination for 3,230 satellites of the 3,236 currently authorized satellites. Accordingly, there is no projected impact to the orbital debris assessments for these satellites, and all the information provided in the Kuiper Orbital Debris Modification Application, as supplemented, remains accurate and complete. *See* Kuiper Orbital Debris Modification Application; Letter from Carrie Gage, Corporate Counsel, Kuiper Systems LLC, to Karl A. Kensinger, Chief, Satellite Division, International Bureau, FCC, IBFS File No. SAT-MOD-20211207-00186 (June 17, 2022); Consolidated Response of Kuiper Systems LLC, IBFS File No. SAT-MOD-20211207-00186 (July 12, 2022); Letter from Carrie Gage, Corporate Counsel, Kuiper Systems LLC, to Marlene H. Dortch, Secretary, FCC, IBFS File No. SAT-MOD-20211207-00186 (Nov. 23, 2022). Four of the authorized satellites will no longer be included as part of the Kuiper System. With respect to the remaining two satellites, the technical information submitted with this Modification Application shows that Amazon’s orbital design and operational strategies will mitigate orbital debris risks consistent with Section 25.114(d)(14) of the Commission’s rules.

underserved consumers and businesses in the United States and around the globe, and to do so more quickly and efficiently.¹³

III. GRANT OF THE MODIFICATION APPLICATION DOES NOT PRESENT HARMFUL INTERFERENCE CONCERNS.

Under the *Teledesic* precedent,¹⁴ as further explained in the Commission’s grant of SpaceX’s third modification request,¹⁵ the Commission will grant a modification application and allow an operator to retain its processing round status if it “does not present any significant interference problems and is otherwise consistent with Commission policies.”¹⁶ There are five key elements that affect interference into NGSO systems: spacecraft altitude, spacecraft transmit power or power flux-density, coverage definition or minimum elevation angle, constellation size, and the number of co-frequency beams servicing a single location on the ground.¹⁷ Of these, Amazon’s proposed modification alters only the constellation size by *reducing* the number of

¹³ See, e.g., *Inquiry Concerning Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion*, Fourteenth Broadband Deployment Report, 36 FCC Rcd 836, ¶ 2 (2021) (noting that 14.5 million Americans lack access to fixed terrestrial broadband with benchmark download and upload speeds of 25 Mbps and 3 Mbps, respectively).

¹⁴ *Teledesic LLC*, Order and Authorization, 14 FCC Rcd 2261 (IB 1999) (“*Teledesic*”).

¹⁵ *Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization and Order on Reconsideration, 36 FCC Rcd 7995 (2021) (“*Mod3 Order*”).

¹⁶ *Teledesic* ¶ 5. See *Mod3 Order* ¶ 1 (“[T]his modification does not create significant interference problems that would warrant treatment of SpaceX’s system as if it were filed in a later processing round.”); *id.* ¶ 3 (“The Bureau assessed each of the modification requests in accordance with its *Teledesic Order* precedent, and in both instances found that grant of the modification was in the public interest, and would not materially change the interference environment. Therefore, in neither of these instances did the Bureau conclude that SpaceX’s system needed to be considered as part of a later processing round.”) (citations omitted).

¹⁷ Cf. *Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, 34 FCC Rcd 12307, 12312 ¶ 15 (IB 2019) (“Given that there is no change in orbit altitude and in the number of satellites, we conclude there is no material change to the interference environment.”).

satellites, therefore decreasing the likelihood of interference. The simulations and analyses included in the Technical Appendix to this Modification Application provide evidence that the specific modification contemplated here does not increase interference. As such, the Commission should thus grant the Modification Application without changing the Kuiper System's processing round status.

IV. CONCLUSION.

Prompt grant of this application will accelerate the deployment of the Kuiper System and its ability to expand access to reliable, high-quality broadband connectivity to consumers and businesses across the globe, including in rural and hard-to-reach areas of the United States. Accordingly, Amazon respectfully requests modification of the Kuiper System as described in this Modification Application.

Respectfully submitted,

/s/ Catherine Kuersten

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