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

In the Matter of	)	
	)	
Kuiper Systems, LLC	)	IBFS File No. SAT-LOA-20190704-00057
	)	
Application for Authority to Deploy and Operate a Ka-band Non-Geostationary Satellite Orbit System	)	Call Sign S3051

ORDER AND AUTHORIZATION

Adopted: July 29, 2020 **Released: July 30, 2020**

By the Commission:

I. INTRODUCTION

1. In this Order and Authorization, we grant, to the extent set forth below, the request of Kuiper Systems LLC (Kuiper or Amazon) to deploy a non-geostationary satellite orbit (NGSO) system to provide service using certain Fixed-Satellite Service (FSS) and Mobile-Satellite Service (MSS) Ka-band frequencies with conditions adopted herein.

2. Specifically, we grant Kuiper's application for authority to deploy and operate its NGSO FSS system in the 17.7-17.8 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 19.3-19.7 GHz, 19.7-20.2 GHz, 27.5-28.6 GHz, 28.6-29.1 GHz, 29.1-29.5 GHz, and 29.5-30.0 GHz bands, and to provide MSS, in addition to FSS, in the 19.7-20.2 GHz and 29.5-30.0 GHz bands, and to use MSS feeder links in the 19.4-19.6 GHz and 29.1-29.5 GHz bands, subject to certain conditions. We deny Kuiper's request for a waiver of the Commission's processing round rules, include Kuiper's application in the March 2020 Processing Round,[1] and address certain other requests. In granting Kuiper's application, we address concerns expressed in the record and deny the petition to dismiss or defer filed by SES Americom, Inc. and O3b Limited (collectively SES), the petition to dismiss without prejudice or hold in abeyance filed by Telesat Canada (Telesat), and the petitions to deny filed by Theia Holdings A, Inc. (Theia) and WorldVu Satellites Limited (WorldVu) to the extent discussed herein.

3. We conclude that grant of Kuiper's application would advance the public interest by authorizing a system designed to increase the availability of high-speed broadband service to consumers, government, and businesses.

[1] *See Cut-off Established for Additional NGSO FSS Applications or Petitions for Operations in the 10.7-12.7 GHz, 12.75-13.25 GHz, 13.85-14.5 GHz, 17.7-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz Band*, Public Notice, Report No. SPB-279, DA 20-325 (Mar. 24, 2020) (establishing a cut-off date of May 26, 2020 for additional applications and petitions) (*March 2020 Processing Round Public Notice* or March 2020 Processing Round).

II. BACKGROUND

4. *Application*. In its July 4, 2019 application,[2] Kuiper proposes to deliver high-speed, low-latency broadband services by operating 3,236 satellites in 98 orbital planes at altitudes of 590 km, 610 km, and 630 km.[3] Kuiper states that its system, which will also include gateway earth stations, customer terminals, "software-defined network" and satellite control functionality, satellite operations centers, telemetry, tracking, and command (TT&C) earth stations, and other technologies,[4] will be capable of providing continuous coverage to customers within approximately 56°N and 56°S latitude, thereby serving the contiguous United States, Hawaii, U.S. territories, and other world regions.[5]

5. According to Kuiper, the system will be deployed in five phases, and service will begin once the first 578 satellites are launched.[6] Kuiper plans to use the following frequencies: 17.7-18.6 GHz (space-to-Earth), 18.8-20.2 GHz (space-to-Earth), and 27.5-30.0 GHz (Earth-to-space).[7]

6. In its application, Kuiper seeks waivers of certain Commission rules,[8] and states that its system will provide broadband services to unserved and underserved consumers, businesses in the United States, and global customers by employing advanced satellite and earth station technologies.[9] Kuiper states that Amazon has the global terrestrial network and computing infrastructure necessary to support the Kuiper system[10] and that the system is designed to share spectrum with other NGSO FSS systems authorized by the Commission or granted market access.[11]

7. *Comments*. The International Bureau released a public notice regarding Kuiper's application,[12] and Iridium Communications (Iridium), Space Exploration Holdings LLC (SpaceX), Interactive Entertainment Trade Organization, and filing jointly, Hughes, Intelsat, and Inmarsat (GSO

[2] IBFS File No. SAT-LOA-20190704-00057 (filed Jul. 4, 2019) (Kuiper Application). Kuiper is a wholly-owned subsidiary of Amazon.com Services (Amazon).

[3] At 590 km, Kuiper plans 28 orbital planes with 28 satellites per plane for a total of 784 satellites. At 610 km, Kuiper plans 42 orbital planes with 36 satellites per plane for a total of 1296 satellites. At 630 km, Kuiper plans 34 orbital planes with 34 satellites per plane for a total of 1156 satellites. Kuiper Application, Legal Narrative at 2-3.

[4] *Id*. at 5.

[5] *Id*. at 2. Given the proposed design of the Kuiper system, service cannot be provided to the majority of Alaska. *Id*. at 27-28.

[6] *Id*. at 3. "Coverage begins at 56°N and 56°S latitudes and quickly expands towards the equator as more satellites are launched." *Id*.

[7] The 17.7-17.8 GHz (non-U.S. only), 17.8-18.3 GHz, 18.3-18.6 GHz, 18.8-19.3 GHz, 19.7-20.2 GHz, 28.5-28.6 GHz, 28.6-29.1 GHz, and 29.5-30.0 GHz bands will be used for customer links. The 19.3-19.4 GHz, 19.4-19.6 GHz, 19.6-19.7 GHz, 19.7-20.2 GHz, 27.5-28.35 GHz, 28.35-28.5 GHz, 29.1-29.25 GHz, 29.25-29.5, and 29.5-30.0 GHz bands will be used for gateway links. The 19.25-19.3 GHz and 19.3-19.4 GHz bands will be used for TT&C downlinks; and the 27.5-28.05 GHz band for TT&C uplinks (specifically, the 27.5-27.55 GHz, 27.95-28.0 GHz, 28.0-28.05 GHz bands). Kuiper Application, Legal Narrative at 4-5. Kuiper also requests to conduct MSS operations, in addition to FSS, in the 19.7- 20.2 GHz and 29.5-30.0 GHz bands and feeder links for the MSS component in the 19.4-19.6 GHz and 29.1-29.5 GHz bands. *Id*. at 23-24.

[8] Kuiper requests waivers of sections 25.157(c), 25.155(b), 25.146(b), 25.156(d)(4), and 25.114(c)(4)(v) of the Commission's rules. Kuiper also request waivers of the U.S. Table of Frequency Allocations, section 2.106, and Ka-band plan. *Id.* at 17-29.

[9] Kuiper Application, Legal Narrative at i-ii.

[10] *Id*. at ii.

[11] *See, e.g*., Kuiper Application at 14-15.

[12] *See* Satellite Policy Branch Information, Public Notice, Report No. SAT-01416 (Sept. 27, 2019).

Operators), filed comments.[13] SES, WorldVu, Telesat, and Theia filed petitions in opposition to Kuiper's application,[14] requesting that the Commission dismiss or defer (SES), dismiss without prejudice or hold in abeyance (Telesat), or deny (Theia and WorldVu). Kuiper opposed and responded to these pleadings,[15] and several parties submitted reply comments and/or replied to Kuiper's Opposition.[16]

8. *Subsequent Developments*. On March 24, 2020, the International Bureau initiated a new processing round for additional applications or petitions for operations in the 10.7-12.7 GHz, 12.75-13.25 GHz, 13.8-14.5 GHz, 17.7-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands by NGSO FSS systems. Kuiper's application was provisionally included as part of this new processing round.[17] All but the 13.8-13.85 GHz and the 17.7-17.8 GHz bands were frequencies subject to prior processing rounds for NGSO FSS systems initiated in July 2016 and May 2017.[18]

III. DISCUSSION

9. After review of the record, we conclude that grant of the Kuiper application will serve the public interest, subject to the requirements and conditions specified herein. The broadband services Kuiper proposes to provide will benefit American consumers. Below, we address Kuiper's requests to operate in various Ka-band frequencies for both MSS and FSS, power limit compliance, orbital debris mitigation, the various issues raised by commenters, and Kuiper's waiver requests.

A. FSS Operations in the Ka-Band

10. We grant Kuiper's requests to deploy and operate an NGSO system to provide service using certain FSS Ka-band frequencies with conditions adopted herein.

---

[13] Comments of Iridium Communications, Inc. (Iridium) (filed Oct. 28, 2019); Comments of Space Exploration Holdings LLC (Space X) (filed Oct. 28, 2019), Comments of Interactive Entertainment Trade Organization (Interactive Entertainment) (filed Oct. 28, 2019), and Comments of Hughes Network Systems, LLC, Intelsat License LLC, and Inmarsat Inc. (GSO Operators) (filed Oct. 28, 2019).

[14] SES Americom, Inc. and O3b Limited, Petition to Dismiss or Defer (collectively SES) (filed Oct. 28. 2019) (SES Petition); WorldVu Satellites Limited, Petition to Deny (OneWeb) (filed Oct. 28. 2019); Telesat Canada, Petition to Dismiss Without Prejudice or Hold in Abeyance (Telesat) (filed Oct. 28. 2019); and Theia Holdings A, Petition to Deny (Theia) (filed Oct. 28. 2019).

[15] Consolidated Opposition and Response of Kuiper Systems LLC (Kuiper Opposition) (filed Nov. 13, 2019).

[16] Reply Comments of Iridium Communications, Inc. (Iridium Reply) (filed Nov. 25, 2019); Reply of Space Exploration Holdings, LLC (SpaceX Reply) (filed Nov. 25, 2019); Telesat Reply to Kuiper's Consolidated Response and Reply (Telesat Reply) (filed Nov. 25, 2019); Reply of SES Americom, Inc. and O3B Limited, (filed Nov. 25.2019) (SES Reply); and Theia's Reply to Consolidated Opposition (Theia Reply) (filed Nov. 25, 2019).

[17] 47 CFR § 25.157. *See March 2020 Processing Round Public Notice*. In response to the March 2020 Processing Round, we received the following applications or petitions: Kepler Communications, Inc. (SAT-LOA-20200526-00059), O3b Limited (SAT-MOD-20200526-00058), EOS Defense Systems USA, Inc. (SAT-MOD-20200526-00057), Viasat, Inc. (SAT-MPL-20200526-00056), Space Exploration Holdings, LLC (SAT-LOA-20200526-00055), Mangata Networks LLC (SAT-LOI-20200526-00054), and Telesat Canada (SAT-MPL-20200526-00053).

[18] *See OneWeb Petition Accepted for Filing; Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions in the 10.7-12.7 GHz, 14.0-14.5 GHz, 17.8-18.6 GHz, 18.8-19.3 GHz, 27.5-28.35 GHz, 28.35-29.1 GHz, and 29.5-30.0 GHz Bands*, Public Notice, 31 FCC Rcd 7666 (rel. Jul. 15, 2016) (establishing a cut off deadline of Nov. 15, 2016 for additional applications and petitions in these bands) (July 2016 Processing Round); *Satellite Policy Branch Information: Cut-Off Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 12.75-13.25 GHz, 13.85-14.0 GHz, 18.6-18.8 GHz, 19.3-20.2 GHz, and 29.1-29.5 GHz Bands*, Public Notice, 32 FCC Rcd 4180 (rel. May 26, 2017) (establishing a cut off deadline of July 26, 2017 for additional applications and petitions in these bands) (May 2017 Processing Round).

11. *Space-to-Earth Operations in the 18.8-19.3 GHz and Earth-to-Space Operations in the 28.6-29.1 GHz Bands.* We grant Kuiper's request to operate in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, since the request is consistent with the Commission's Ka-band Plan that designates these frequency bands for NGSO FSS operations on a primary basis.[19]

12. *Space-to-Earth Operations in the 17.7-17.8 GHz Band (outside of the United States).* Under the U.S. Table of Frequency Allocations (U.S. Table) the 17.7-17.8 band is allocated to the Fixed Service (FS) on a primary basis and FSS (Earth-to-space) for Broadcasting-Satellite Service feeder links. Internationally, however, this band is allocated for FSS (space-to-Earth) in all regions. Kuiper proposes to use this band for user downlinks internationally. We grant Kuiper's request to operate in these bands outside of the United States since its proposed use is consistent with the international allocations and will be used to communicate with non-U.S.-based earth stations.[20]

13. *Space-to-Earth Operations in the 17.8-18.6 GHz Band.* The 17.8-18.3 GHz band is allocated on a primary basis to the FS and on a secondary basis to the FSS. The 18.3-18.6 GHz band is allocated to the FSS on a primary basis and NGSO FSS operations are designated as secondary with respect to GSO FSS operations.[21] Kuiper states that its operations will comply with all applicable Commission and International Telecommunication Union (ITU) downlink power flux density limits.[22] In particular, Kuiper has presented a demonstration that it will comply with international equivalent power flux density (EPFD) limits designed to protect GSO networks in the 17.8-18.6 GHz band and as set forth in Article 22 of the ITU Radio Regulations (ITU-RR).[23] Pursuant to our rules, prior to initiation of service, Kuiper must receive a favorable or "qualified favorable" finding in accordance with Resolution 85 with respect to its compliance with applicable EPFD limits in Article 22 of the ITU Radio Regulations.[24] Accordingly, we grant Kuiper's request to use this band.

14. *Space-to-Earth Operations in the 19.7-20.2 GHz Band.* The 19.7-20.2 GHz band is allocated to the FSS and MSS on a primary basis.[25] The Commission's Ka-band Plan, however, designates this band for GSO FSS on a primary basis and NGSO FSS is secondary with respect to GSO FSS operations. Kuiper provided technical demonstrations to show that its NGSO FSS system will comply with international EPFD limits designed to protect GSO networks in the 19.7-20.2 GHz band and set forth in Article 22 of the ITU-RR.[26] Prior to initiation of service, Kuiper must receive a favorable or "qualified favorable" finding in accordance with Resolution 85 with respect to its compliance with

[19] *Update to Parts 2 and 25 Concerning Non-Geostationary, Fixed-Satellite Service Systems and Related Matters,* Report and Order and Further Notice of Proposed Rulemaking, 32 FCC Rcd 7809, Appendix B (2017) *(NGSO FSS Order).*

[20] *See* Kuiper Application, Legal Narrative at 21 (requesting a waiver of the U.S. Table, to the extent necessary, to operate in this band). Since Kuiper's proposed operations are consistent with the U.S. Table, there is no need to address this request.

[21] *Id.* at 3-4.

[22] Kuiper Application, Technical Appendix at B-1, B2.

[23] *Id.* at B-2.

[24] 47 CFR § 25.146(c) 47 CFR § 25.146(c). Resolution 85 (WRC-03) requires the Radiocommunication Bureau of ITU to verify compliance of frequency assignments of non-geostationary fixed satellite service systems with the single-entry equivalent-power flux density (EPFD) limits in Tables 22-1A, 22-1B, 22-1C, 22-1D, 22-1E, 22 2 and 22-3 of Article 22 of the Radio Regulations and to determine the coordination requirements under Nos. 9.7A and 9.7B.

[25] 47 CFR §2.106.

[26] Kuiper Application, Technical Appendix at B-1, B-2.

applicable EPFD limits in Article 22 of the ITU-RR.[27] Since Kuiper's proposed use is consistent with our rules, we grant Kuiper's request to operate in this band as conditioned.

15. *Earth-to-Space Operations in the 27.5-28.6 GHz Bands.* The 27.5-28.35 GHz band is designated for FSS on a secondary basis in the United States. The FSS (Earth-to-space) is secondary to the Upper Microwave Flexible Use Service (UMFUS) in the band except for FSS operations associated with certain earth stations, as specified in the Commission's rules. Kuiper's operations within the United States are on a secondary basis to UMFUS and are subject to the earth station siting provisions of section 25.136 of the Commission's rules.[28]

16. Kuiper has presented a demonstration that it will comply with international EPFD limits designed to protect GSO networks in the 27.5-28.6 GHz band set forth in Article 22 of the ITU-RR.[29] Kuiper's request to operate in this band is granted on a non-protected non-interference basis with respect to GSO FSS systems and subject to the applicable EPFD limits. Prior to initiation of service, Kuiper must receive a favorable or "qualified favorable" finding in accordance with Resolution 85 with respect to its compliance with applicable EPFD limits in Article 22 of the ITU-RR.[30]

17. *Earth-to-Space Operations in the 29.5-30.0 GHz Band.* The 29.5-30.0 GHz band is allocated to the FSS and MSS on a primary basis.[31] GSO FSS operations are conducted on a primary basis and NGSO FSS operations are secondary with respect to GSO FSS.[32] Kuiper has stated that its operations in this band will comply with EPFD limits set forth in Article 22 of the ITU-RR to protect GSO FSS operations.[33] Prior to initiation of service, Kuiper must receive a favorable or "qualified favorable" finding in accordance with Resolution 85 with respect to its compliance with applicable EPFD limits in Article 22 of the ITU-RR.[34] Consistent with our rules, we grant Kuiper's request to conduct FSS operations in the 29.5-30.0 GHz band.

B. NGSO MSS Operations in the Ka-Band

18. We grant Kuiper's requests to operate an NGSO system to provide service using certain MSS Ka-band frequencies with conditions adopted herein. As discussed below, the conditions we impose would ensure the most efficient and effective sharing of spectrum while providing Kuiper the regulatory flexibility it seeks to provide both FSS and MSS.

19. *MSS Operations in the 19.7-20.2 GHz and 29.5-30.0 GHz Bands.* Kuiper requests that its operations in the 19.7-20.2 GHz and 29.5-30.0 GHz bands also be conducted in the MSS, in addition to the FSS operations addressed above.[35] Kuiper maintains that adding the MSS designation does not change the characteristics of its proposed plan or increase interference. Kuiper also requests waivers of the Commission's Ka-band plan to the extent necessary to operate FSS and MSS in these bands.[36] Allowing MSS operations in these bands would give Kuiper flexibility to operate feeder links in the 19.4-

[27] *See* 47 CFR § 25.146(c).

[28] 47 CFR § 25.136.

[29] Kuiper Application, Technical Appendix at B-1, B-10.

[30] *See* 47 CFR § 25.146(c).

[31] U.S. Table of Frequency Allocations, 47 CFR § 2.106.

[32] *NGSO FSS Order*, 32 FCC Rcd at 7813, para. 9.

[33] Kuiper Application, Technical Appendix at B-1, B-10.

[34] *See* 47 CFR § 25.146(c).

[35] Kuiper Application, Legal Narrative at 23-24.

[36] *Id.*

19.6 GHz and 29.1-29.5 GHz bands, which can only be used by NGSO systems for feeder links to MSS space stations. Kuiper states that the Commission granted O3b market access to provide MSS and FSS in these bands,[37] and requests that it be authorized on the same terms as O3b, *i.e*. that it comply with PFD and EPFD limits; cooperate with other NGSO operators to ensure that aggregate $EPFD^{down}$ limits comply with Article 22 of the ITU Radio Regulations and Resolution 76 of the ITU-RR; and conduct its MSS operations on a non-interference, non-protected basis with respect to other operations in the bands.[38]

20. Iridium states that the Commission should deny Kuiper's request to operate NGSO MSS feeder links associated with MSS operations in the 19.7-20 GHz and 29.5-30.0 GHz bands or, alternatively, condition any authorization to ensure that Iridium's network is protected and Kuiper actually uses the spectrum to support MSS operations.[39] Iridium argues that the Commission should enforce the Ka-band plan and reject Kuiper's request to operate its FSS system "in feeder-link spectrum reserved for NGSO systems in the Mobile-Satellite Service."[40] Iridium states that Kuiper "has not shown special circumstances that would warrant such special treatment, and it has not demonstrated that Kuiper can share with Iridium."[41] According to Iridium, Kuiper is primarily focused on providing fixed broadband services and fixed backhaul to terrestrial operators; and that most of the ESIMs communicating with Kuiper's satellite system will be licensed as FSS, not MSS terminals.[42] From this, Iridium concludes that the "vast majority" of Kuiper's traffic would be FSS, not MSS.[43] Iridium argues that the grant of O3b waivers for these frequencies was a very different situation because (1) O3b received its waiver before the "Commission proposed service rules permitting NGSO ESIMs as an application of FSS," and thus a waiver was needed;[44] and (2) the size of Kuiper's system raises significant issues for new NGSO entrants and applications for entry.[45]

21. We are not persuaded that Kuiper's request for MSS operations is very different than O3b's market access for MSS and MSS feeder links in these bands. Similar to O3b, Kuiper requests authority for both FSS and MSS in certain bands. Although there is a size difference between Kuiper's system and O3b's, we also evaluate each application or market access request separately based on its own specific circumstances in our public interest analysis. We find that it is in the public interest to grant Kuiper's request to provide MSS, in addition to FSS, in the 19.7-20.2 GHz and 29.5-30.0 GHz bands subject to certain conditions discussed herein.

22. These bands are allocated internationally to the FSS and MSS.[46] The Commission has also adopted these frequency allocations, but has not established service rules for MSS operations in the

[37] *Id*. at 24.

[38] *Id*.

[39] Iridium Reply at 2. If Kuiper's request is granted, Iridium argues for the following conditions: limiting operations in the 19.4-19.6 GHz, 29.1-29.25 GHz, and 29.25-29.5 GHz bands to communications between feeder-link earth stations and user terminals licensed by the Commission in the MSS; operating in NGSO MSS feeder-link bands on a secondary basis at most; and on successfully coordinating with Iridium. *Id*. at 8-9.

[40] Iridium at 2.

[41] *Id*.

[42] *Id*. at 5.

[43] *Id*.

[44] Iridium Reply at 5.

[45] Iridium at 6-7. In response to Iridium's arguments about the size of its constellation, Kuiper asserts that the number of satellites in the Kuiper system makes co-existence easier to accomplish. Kuiper Opposition at 32.

[46] 47 CFR § 2.106.

19.7- 20.2 GHz and 29.5-30.0 GHz bands.[47] Although EPFD limits do not apply to NGSO MSS systems, we condition Kuiper's operations in the 19.7-20.2 GHz and 29.5-30.0 GHz bands on complying with the applicable EPFD limits for FSS operations, even when these operations are conducted within the MSS. This is justified because, as stated by Kuiper, these MSS operations have the same characteristics as its FSS operations.[48] This condition is also consistent with the default requirement adopted in the *NGSO FSS Order* that NGSO systems protect GSO networks.[49] In addition, we remind Kuiper that its MSS operations cannot claim protection from current or future GSO FSS networks.

23. We note that there is no sharing criteria between NGSO FSS and NGSO MSS systems in the 19.7-20.2 GHz and 29.5-30.0 GHz bands. Kuiper states that its MSS operations will have the same characteristics of the previously described FSS operations and that directional earth station antennas will also be used for these operations.[50] Therefore, Kuiper's NGSO MSS operations would not be distinguishable from NGSO FSS operations in the 19.7-20.2 GHz and 29.5-30.0 GHz bands being conducted with ESIMs. Although Iridium argues that we should deny Kuiper's operations as inconsistent with the Ka-band plan, given the existing MSS allocations and the fact that Kuiper's proposed NGSO MSS operations have the same characteristics as those in an NGSO FSS system—a designated usage under the Ka-band plan—we find it in the public interest to grant Kuiper authority to operate as an NGSO MSS system with conditions in this band and waive the Ka-band plan to the extent necessary. This action ensures the most efficient and effective sharing of spectrum while providing Kuiper the regulatory flexibility it seeks to provide both FSS and MSS.

24. *The 19.4-19.6 GHz and 29.1-29.5 GHz MSS Feeder Link Bands*. Kuiper requests authority to operate in the 19.4-19.6 GHz band and 29.1-29.5 GHz band for the provision of MSS feeder links to its NGSO space stations. Under the Ka-band plan, use of the 19.4-19.6 GHz and 29.1-29.5 GHz bands by NGSO systems is limited to feeder links for non-geostationary-satellite systems in the MSS.[51]

25. Kuiper states that its operation of MSS feeder links in the 19.4-19.6 GHz and 29.1-29.5 GHz bands would be consistent with the Ka-band plan.[52] To protect Iridium's operations, Kuiper states that it will not co-locate its gateway earth stations with existing or planned Iridium gateway earth stations; stations that are close enough to generate harmful interference will be operated to avoid co-frequency and

[47] 47 CFR § 25.217. Historically, FSS and MSS provided different services using distinct frequency bands. Over the last 10 years, however, the Commission has allowed mobile applications within FSS, such as earth stations on vessels (ESV), vehicle-mounted earth stations (VMES), and earth-stations aboard aircraft (ESAA). These earth stations operate within the FSS but they all transmit and receive while in motion. Generally, the primary difference between the mobile applications operating in the FSS and MSS concerned the type of antenna in use (directional for the services operating within the FSS, or omni-directional services operating with the MSS). In MSS only bands, frequencies were typically assigned to a single operator because omni-directional antennas could not discriminate between satellites. In the FSS bands, since the antennas were directional and used by multiple operators, satellites have been assigned to the same frequencies because the antennas could discriminate among the different satellites. Kuiper's operations will include mobile operations, and its terminals will use directional antennas as described above for mobile applications operating in the FSS, which are better equipped to share spectrum compared to those for MSS only frequencies. The definition of MSS does not specify the type of antennas used for communications with space stations. *See* 47 CFR § 25.103.

[48] Kuiper Application, Legal Narrative at 23-24.

[49] *See* 47 CFR § 25.289; *NGSO FSS Order,* 32 FCC Rcd at 7809.

[50] Kuiper Application, Legal Narrative at 23-24.

[51] *See* 47 CFR. § 2.106 at NG166 (limiting the use of 19.4-19.6 GHz and 29.1-29.25 GHz by the FSS to feeder links for NGSO systems in the MSS); *id*. at NG535A (limiting the use of 29.25-29.5 GHz by the FSS to GSO systems and feeder links for NGSO systems in the MSS).

[52] *Id*. at 24; *NGSO FSS Order,* 32 FCC Rcd at 7850, Appendix B.

co-polarization operations during predicted events; and if harmful interference is unavoidable, Kuiper states that it will reduce its effective isotropically radiated power (EIRP) or temporarily cease transmission.[53] We note that coordination will be required between Kuiper and any previously authorized NGSO MSS systems not included in the March 2020 Processing Round,[54] including the Iridium system and O3b, over the bands designated for use by NGSO MSS feeder links, *i.e.*, the 19.3-19.7 GHz and 29.1-29.5 GHz bands. Until any required coordination agreement is obtained, operations in the 19.3-19.7 GHz and 29.1-29.5 GHz bands shall not be conducted. Sharing of the 19.3-19.7 GHz and 29.1-29.5 GHz bands with other systems authorized within the March 2020 Processing Round will be subject to section 25.261.[55] The conditions address Iridium's concerns about Kuiper's operations.

C. Compliance with Power Limits

26. *EPFD Analysis*. We find that the EPFD analysis provided in Kuiper's application and associated filings is sufficient to justify authorization in many of Kuiper's proposed frequency bands as conditioned. As noted in the section on FSS operations in the Ka-band, and as we have done in connection with other NGSO FSS systems, we condition this authorization on Kuiper receiving a favorable or "qualified favorable" rating of its EPFD demonstration by the ITU prior to initiation of service. Additionally, Kuiper must communicate the ITU finding to the Commission and, in case of an unfavorable finding, adjust its operation to satisfy the ITU requirements. We note, however, that several commenters expressed concern that, even if Kuiper complies with the Commission's rules, it could still cause unacceptable interference to GSO networks because it has submitted multiple ITU filings for its system, which means that the ITU will issue an analysis based on each filing rather than Kuiper's entire system.[56] In response to this claim, Kuiper argues that "ITU experts are entirely qualified to process Amazon's filing and are well aware of the interconnected nature of the three Amazon ITU submissions."[57] Thus, we condition this grant on Kuiper meeting the single entry EPFD limits in Article 22 for its complete system and require that the ITU finding to be submitted to the Commission explicitly indicate that the joint effect of Kuiper's ITU filings associated with its constellation was taken into account when verifying compliance with the applicable EPFD limits.

27. The GSO Operators also request that the Commission include as a grant condition that "Kuiper must make available to any requesting party the data used as input to the ITU approved validation software to demonstrate compliance with applicable [EPFD] limits."[58] More specifically, SES requests that Kuiper make publicly available PFD masks, equivalent isotropically radiated power masks, and inter-satellite masks.[59] The condition that the GSO Operators request is one we have imposed in the grant of another NGSO FSS system[60] and we will do the same here.[61] SES and GSO Operators also

[53] Kuiper Application, Technical Appendix at C-8 and C-9.

[54] *See infra* paras. 33-45 (discussing Kuiper's processing round waiver request and deciding to include Kuiper's application in the March 2020 Processing Round).

[55] 47 CFR § 25.261.

[56] SES/O3b Reply at 12-14; GSO Operators at 2; Letter from Kimberly M. Baum, Vice President, Regulatory Affairs, to Marlene H. Dortch, Secretary, Federal Communications Commission, IBFS File No. SAT-LOA-20190704-00057, at 1-2 (filed Jan. 14, 2020); SpaceX Reply at 22; WorldVu Reply at 13-14.

[57] Kuiper Opposition at 26.

[58] GSO Operators at 2.

[59] SES at 14.

[60] *Space Exploration Holdings, LLC, Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, 34 FCC Rcd at 12307, 12315, para. 19(p) (IB 2019) (*SpaceX Modification*).

[61] We note that this condition covers the request by SES because the requested information is used for EPFD calculations.

request that they be allowed to view and verify such information prior to the initiation of Kuiper service.[62] As we noted in an earlier order, however, there is no legal requirement that third parties evaluate the sufficiency of EPFD data inputs prior to the deployment of an NGSO system, and we believe that such a requirement would unfairly prejudice Kuiper's timely implementation of its new system.[63]

28. The GSO Operators further argue that the Commission must take steps to ensure that applicable aggregate EPFD limits are met by all operating Ka-band NGSO systems and request that we require that 60 days prior to launch Kuiper must have completed coordination with other NGSO operators to ensure compliance with aggregate EPFD limits.[64] We do not adopt this requirement recommended by the GSO Operators, but instead require that as a condition of authorization, Kuiper must comply with ITU Resolution 76, which makes all NGSO FSS systems, operating in a frequency band where protection of GSO FSS systems is required, jointly responsible for keeping aggregate EPFD levels within limits specified in the same Resolution.[65]

29. As we did in other approvals for NGSO FSS operations,[66] we are permitting Kuiper to operate up to the PFD and EPFD levels specified in applicable regulations, rather than the levels associated with specific demonstrations in its application. We find this flexibility is warranted given the preliminary nature of the system design, the fact that this grant is conditioned on Kuiper's satisfaction of the ITU's EPFD assessment, and the condition that Kuiper cooperate with other NGSO operators to meet limits for aggregate EPFD.

D. Orbital Debris Mitigation

30. An applicant for a space station authorization must submit a description of the design and operational strategies that it will use to mitigate orbital debris, including a statement detailing post-mission disposal plans for space stations at the end of their operating life.[67] Kuiper included an orbital debris mitigation plan in its application.[68] We have reviewed Kuiper's orbital debris mitigation plan, as supplemented.[69]

31. Kuiper indicates that its orbital debris mitigation plan is a preliminary assessment pending the final constellation design.[70] Kuiper proposes to deorbit satellites in no more than 355 days following completion of their mission, a shorter time frame than the 25-year standard established by

[62] SES at 14 (requesting a review period of at least 30 days after files have been submitted to interested parties for review); and GSO Operators at 2.

[63] *SpaceX Modification* at 12307, para. 11.

[64] GSO Operators at 3-4.

[65] *See* 47 CFR § 25.146, Articles 208, 21, and 22 ITU Radio Regulations, and Resolution 76 of the ITU Radio Regulations.

[66] *See, e.g., WorldVu Satellites Limited, Petition for Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System,* Order and Declaratory Ruling, 32 FCC Rcd 5366 (2017) (*OneWeb Order*); *Space Norway AS,* Order and Declaratory Ruling, 32 FCC Rcd 9649 (2017) (*Space Norway Order*); *Telesat Canada*, Order and Declaratory Ruling, 32 FCC Rcd 9663 (2017) (*Telesat Canada Order*); *Space Exploration Holdings, LLC*, Memorandum Opinion, Order and Authorization, 33 FCC Rcd. 3391 (2018) (*SpaceX Order*).

[67] *Mitigation of Orbital Debris*, Second Report and Order, 19 FCC Rcd 11567, 11619 (2004); 47 CFR § 25.114(d)(14).

[68] *See* Kuiper Application, Technical Appendix at II, A-B.

[69] Letter from C. Andrew Keisner, Lead Counsel, Kuiper Systems LLC (Kuiper Orbital Debris Letter) (dated Sept. 18, 2019).

[70] Kuiper Orbital Debris Letter at 2.

NASA. Kuiper states that it will comply with NASA standards regarding surviving debris, but it is not yet able to provide an analysis using NASA's Debris Assessment Software. SpaceX notes, however, that Kuiper failed to submit a casualty risk analysis as required by section 25.114(d)(14)(iv),[71] which requires an estimate regarding whether portions of a satellite will survive re-entry and reach the Earth's surface, and an estimate regarding the probability of human casualty. WorldVu notes that Kuiper fails to provide an explanation of the risk of intra-shell collisions between failed satellites because it does not address management of the crossing points of its shells.[72]

32. Because the design of Kuiper's satellites is not completed, and because Kuiper consequently did not present specific information concerning some required elements of a debris mitigation plan, we condition our grant of the Kuiper application on Kuiper presenting, and the Commission granting, a modification of this authorization to provide for review of the final orbital debris mitigation plan.[73] The updated plan should address in greater detail, for the system as a whole, the collision risk (including consideration of reliability of post-mission disposal and the effect of failed satellites on risk) and re-entry casualty risk.[74] Additionally, consistent with conditions placed on other NGSO FSS systems, Kuiper must coordinate its physical operations with space stations of NGSO systems operating at similar orbital altitudes.[75] We also note that the Commission recently updated its orbital debris rules and initiated a Further Notice of Proposed Rulemaking.[76] The Kuiper system will be subject to any applicable rules adopted in that proceeding.

E. Application of Processing Round Rules and Section 25.261 Sharing Framework

33. Kuiper filed its application on July 4, 2019 outside of previous processing rounds initiated in July 2016 and May 2017 for NGSO FSS systems.[77] The International Bureau placed Kuiper's application on public notice on September 27, 2019, and subsequently decided to provisionally place Kuiper's application in a new processing round (March 2020 Processing Round) for additional applications or petitions for NGSO systems.[78] For licensing and grants of U.S. market access for NGSO-like systems, the Commission employs a processing round procedure which includes a public notice

[71] SpaceX at 17-19; SpaceX Reply at 21.

[72] WorldVu Reply at 13.

[73] The Commission and the International Bureau have previously required applicants to file a modification application including updated orbital debris mitigation information in some instances. *See SpaceX Order*, at 33 FCC Rcd. 3391, 3398, para. 15 (2018 *LeoSat MA Inc.*, Order and Declaratory Ruling, 33 FCC Rcd 11486, 11491, para. 12 (2018)*; Viasat, Inc. Petition for Declaratory Ruling Granting Access for a Non-U.S. Licensed Non-Geostationary Orbit Satellite Network,* FCC 20-56, para. 30, 2020 WL 1977107, Order and Declaratory Ruling (April 22, 2020) (*ViaSat Order*); *Northrop Grumman Space & Mission Systems Corp*., Order and Authorization, 24 FCC Rcd 2230, 2263-64, para. 102 (IB 2009) and *ContactMEO Communications, LLC*, Order and Authorization, 21 FCC Rcd 4035, 4052-53, para. 47 (IB 2006).

[74] As indicated in the recently revised U.S. Government Orbital Debris Mitigation Standard Practices (ODMSP), at p. 7, 5-1 and p. 5, 4-1.a., large constellations should target high post-mission disposal reliability, taking into consideration factors such as mass, collision probability, orbital location and other relevant parameters, and should limit cumulative re-entry casualty risk from the constellation, preferably through direct re-entry, design for demise, or targeted re-entry away from land masses.

[75] *See e.g.*, *SpaceX Order* at 3398, para. 15 and *ViaSat Order* paras. 31, 52c.

[76] *Mitigation of Orbital Debris in the New Space Age*, Report and Order and Further Notice of Proposed Rulemaking, 35 FCC Rcd 4156 (2020).

[77] *See* n. 18, *supra*.

[78] 47 CFR § 25.157. *See* n. 1, *supra*.

announcing a cut-off date for applications to be considered concurrently.[79] Kuiper requests waivers of Commission rules that set the deadlines and procedures for consideration of applications in processing rounds.[80] Kuiper states that granting its requests for waiver of sections 25.155(b) and 25.157(c) of the Commission's rules "would not undermine the purpose of the rule because adoption of the Section 25.261 spectrum sharing framework by the Commission in its *NGSO FSS Order* moots the need for comparative review to ensure competitive entry."[81] Kuiper argues that the Commission should approve its request to operate in the requested Ka-band frequencies pursuant to section 25.261 of the Commission's rules,[82] and states that "[w]aiver also serves the public interest better than strict adherence to the rules of [s]ections 25.157(c) and 25.155(b) because of the Kuiper System's ability to share spectrum with existing licensees as well as new entrants."[83]

34. As discussed below we find that Kuiper's premise that our processing round rules are mooted by the adoption of section 25.261 spectrum sharing rules is erroneous and Kuiper has not shown otherwise that a grant of its waiver request of sections 25.155(b) and 25.157(c) of the Commission's processing round rules would serve the public interest in this particular case. Accordingly, Kuiper will be included in the March 2020 Processing Round. We also find an insufficient basis to treat Kuiper on an equal basis with earlier authorized systems under section 25.261 of the Commission rules, and find that Kuiper must coordinate to prevent harmful interference to operational systems licensed or granted U.S. market access in the previous NGSO FSS processing rounds. We expect that, regardless of the sharing status of systems in different processing rounds, systems authorized in an earlier processing round may not withhold information necessary to effectuate good faith coordination to enable Kuiper to start operations.

35. *NGSO Processing Round Waiver Request*. In 2003, the Commission adopted a modified processing round procedure for NGSO-like satellite systems providing that applications for NGSO-like satellite systems be treated as either a "competing application," *i.e*., filed in response to a public notice initiating a processing round, or a "lead application," *i.e*. all other applications for NGSO-like satellite operation.[84] Lead applications establish a cut-off date for competing NGSO-like satellite system applications and provide interested parties an opportunity to file pleadings in response to the application.[85] The Commission also stated that all applicants in a processing round would be on equal footing with respect to coordination and in the event that there is not enough spectrum to accommodate all qualified applicants, the Commission will divide the spectrum equally among the applicants.[86] Shortly after adoption of that decision, the Commission also adopted a default spectrum sharing regime for Ka-band

[79] 47 CFR §§ 25.156 and 25.157.

[80] 47 CFR § 25.155(b) ("A license application for NGSO-like satellite operation . . . will be entitled to comparative consideration with one or more mutually exclusive applications only if the application is received by the Commission in a condition acceptable for filing by the "cut-off" date specified in a public notice."); 47 CFR § 25.157(c).

[81] *See* Kuiper Application, Legal Narrative at 17.

[82] 47 CFR § 25.261.

[83] Kuiper Application, Legal Narrative at 17.

[84] 47 CFR § 25.157(c). *Amendment of the Commission's Space Station Licensing Rules and Policies,* First Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 12674, Appendix B, 10896 (2003) (*2003 Space Station Licensing Reform Order*).

[85] *Id*. at § 25.157(c)(1)-(2).

[86] *2003 Space Station Licensing Reform Order,* 18 FCC Rcd 10760, 10783, para 48.

NGSO FSS systems that was similar to the default sharing policy adopted for NGSO FSS systems operating in the Ku-band.[87]

36. In 2017, the Commission adopted the *NGSO FSS Order*[88] and stated that the purpose of the "recent processing rounds was to establish a sharing environment among NGSO systems" that would "provide a measure of certainty" as opposed to "adopting an open-ended requirement to accommodate all future applicants."[89] To that end, the Commission modified the default spectrum sharing rules for NGSO FSS systems, by adopting a 6% ΔT/T coordination trigger.[90] The Commission also noted that coordination among NGSO FSS operators in the first instance offers the best opportunity for efficient spectrum sharing. Before resorting to a default mechanism, the Commission requires authorized NGSO FSS operators to discuss their technical operations in good faith with an aim to accommodating both systems.[91] The Commission stated that it would initially apply the default rule to qualified applicants in a processing round and that the treatment of later-filed applicants relative to systems authorized in a prior processing round would be determined on a case-by-case basis.[92] Kuiper argues that in this case-by-case analysis should conclude that the ability of Kuiper's system to satisfy section 25.261 spectrum sharing requirements obviates the need for its participation in a processing round.[93]

37. Kuiper states that the NGSO processing round framework the Commission created in 2003 was based on satellite systems that communicated with earth stations that had minimal or non-existent directivity towards a satellite. This lack of directivity generally prevented NGSO systems from operating in the same spectrum without causing harmful interference to each other.[94] Kuiper contends that since its system will use directional antennas this "essentially moots the need for comparative consideration of multiple applications in a processing round" because grant of its application would not foreclose grant of future applications that chose to use the same spectrum.[95] Kuiper also states that processing round and spectrum sharing rules operate independently of each other, such that a processing round is still necessary for systems that lack the ability to share spectrum, but that participation in a processing round is not a prerequisite to "sharing spectrum with authorized and previously-filed systems."[96] Thus, Kuiper states, "the question before the Commission in considering waiver of the

[87] *Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed-Satellite Service in the Ka-Band*, Report and Order, 18 FCC Rcd. 14708, para. 19 (2003). Specifically, an "Avoidance of In-Line Interference Events" approach was adopted under which all qualified applicants would share the available spectrum except when earth stations and space stations of different systems move into an alignment that creates an in-line interference event. The spectrum would be split for the duration of the in-line event. *See Establishment of Policies and Service Rules for the Non-Geostationary Satellite Orbit, Fixed Satellite Service in the Ku-band*, Report and Order, 17 FCC Rcd 7841 (2002).

[88] *NGSO FSS Order,* 32 FCC Rcd 7809, 7826, para. 50.

[89] *Id*. at 7829, para. 61.

[90] *Id*. at 7825, para 49. The Commission also noted that the rule applies to NGSO FSS operation with earth stations with directional antennas. 47 CFR § 25.261.

[91] *NGSO FSS Order*, 32 FCC Rcd at 7825, para. 48.

[92] *Id*. at 7829, para. 61.

[93] Kuiper Application, Legal Narrative at 10-16, citing 47 CFR § 25.261. Kuiper also argues that a waiver of the processing round is justified by the significant public interest benefit it believes its system will provide and that a waiver does not undercut the policies behind the requirement of a processing round. Kuiper Opposition at 5-6.

[94] Kuiper Application, Legal Narrative at 18.

[95] *Id*. at 19.

[96] *Id*. at 5-6.

processing round rules is whether the Kuiper system would preclude entry of future entrants"[97] "and [can] coexist with other authorized systems."[98] Kuiper contends that its system will not preclude future entry and can coexist with authorized systems, and that section 25.261 applies to "all qualifying NGSO FSS systems regardless of when their applications are received."[99]

38. Kuiper asserts that its analysis shows that operation of its system will lead to a more favorable interference environment because Boeing and LeoSat, both of which filed in connection with the processing rounds initiated in July 2016 and May 2017, will not operate their proposed systems. Kuiper contends that the design of those two systems would have created a "large number of long-duration in-line events with other NGSO FSS systems."[100] Kuiper states that the "previously anticipated operating environment [that included Boeing and LeoSat] and the currently proposed operating environment [without Boeing and LeoSat, but with Kuiper] shows no material impact on in-line events,"[101] and that even when no operator seeks to avoid in-line events operators are better off with Kuiper, but without Boeing and LeoSat, due to the challenges that the latter two constellations posed for other operators.[102] Thus, Kuiper argues that, if its system would have no impact on the operations of existing systems, then its system should be on par with previous round authorizations with regard to coordination negotiations. This, according to Kuiper, is consistent with the "case-by-case approach" adopted in the *NGSO FSS Order* and protects the investment expectations of the systems authorized in previous processing rounds.[103]

39. Iridium, WorldVu, and SES object to Kuiper's interpretation of the NGSO spectrum sharing rule and argue that Kuiper seeks to be treated as if it had participated in previous processing rounds, effectively rendering the processing round cut-off date meaningless.[104] SpaceX notes that Kuiper offers no explanation for why it did not participate in the initial processing rounds and that to treat Kuiper as if it had participated makes the processing round pointless.[105] WorldVu argues that when the Commission adopted the *NGSO FSS Order* it was "fully aware of such 'significant advances in spectrum

[97] *Id*. at 8.

[98] Letter from Mariah Dodson Shuman, Corporate Counsel, Kuiper Systems, LLC, to Marlene H. Dortch, Secretary, Federal Communications Commission, IBFS File No. SAT-LOA-20190704-00057, at 21-22 (filed Jan. 27, 2020) (Kuiper Jan. 27 *Ex Parte*).

[99] *Id*. at 20. *See also* Kuiper Opposition at 9-10 (stating that section 25.261 makes no "reference to the filing date or grant of the underlying NGSO system application.").

[100] *See* Kuiper Opposition at 20.

[101] *Id*. at 20-21.

[102] *Id*. at 22.

[103] *See* Kuiper Opposition at 6 (stating that "Amazon's request for waiver of the processing round rule in Section 25.157(c) is grounded in the technical features of the Kuiper System" and "[g]rant of the requested waiver will neither prejudice existing NGSO FSS applications, nor preclude competitive entry by future systems using the same spectrum.").

[104] *See* Iridium at 1 (stating "[p]rocessing the Kuiper application as if Amazon had applied three years ago would burden Iridium unnecessarily, and would place existing NGSO FSS licensees at an unfair disadvantage. It also would eliminate any incentive for future applicants to comply with a cut-off date established by the Commission."); WorldVu Reply at 3 (stating that "[g]iven that the Kuiper Application was filed nearly three years after the First Round cut-off date, Kuiper is presumptively not entitled to share spectrum on an equal basis with First Round participants."); and SES Petition at 6 (stating that "[t]hus, under the terms of the NGSO Order, the 6% $\Delta T/T$ sharing criterion codified in Section 25.261 applies only among the parties who timely filed applications by the November 2016 processing round cut-off deadline.").

[105] SpaceX at 6.

sharing capabilities' as directional antennas, and that Kuiper's 'technological advance[ment]' argument is wrong."[106] WorldVu contends that to authorize Kuiper outside of a processing round and give it equal status regarding spectrum sharing would create "perpetual regulatory uncertainty for current NGSO operators" and affect "long-term capital deployment plans" that must account for an "endless cycle of new entrants seeking to encroach on critical NGSO spectrum resources."[107] SES states that the NGSO spectrum sharing rule "applies only among the parties who timely filed applications by the November 2016 processing round cut-off deadline."[108] Theia notes that nowhere in the *NGSO FSS Order* did the Commission indicate that a case-by-case approach and the adoption of the spectrum sharing rule mooted its long-standing NGSO processing round rules.[109] Theia argues that the spectrum sharing rule "simply creates the sharing framework for authorized NGSO systems but in no way mandates that late-filed systems be permitted to circumvent the processing round rules . . . [and create] incentives for applicants to delay filings until a processing window has closed in order to force concessions from processing round applicants."[110]

40. For the reasons, set forth below, we deny Kuiper's processing round waiver request and find that Kuiper has not made a sufficient showing that its application warrants being treated on an equal basis with systems that filed applications within a previous processing round. Waiver is appropriate only if both (1) special circumstances warrant a deviation from the general rule, and (2) such deviation better serves the public interest.[111] Generally, the Commission may waive any rule for good cause shown[112] and, in making this determination, may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis.[113]

41. We find that Kuiper has failed to provide sufficient justification to waive our processing round rules. Kuiper asserts that the size, scope, and location of Kuiper's planned investment, and the type of services proposed[114] constitute a "compelling public interest [benefit]"[115] and placing Kuiper in a new processing round when it has demonstrated the ability of its system to share with other systems "subordinat[es] the rights of later-in-time applicants in the context of the FCC processing-round framework [and] would chill investment in NGSO FSS satellite technology."[116] Kuiper provides, however, no evidence that there is a need for a deviation from our processing round here.

42. Kuiper's waiver request relies on its premise that "adoption of the Section 25.261 spectrum sharing framework by the Commission in its *NGSO FSS Order* moots the need" for our

---

[106] WorldVu Reply at 5.

[107] WorldVu at 11.

[108] SES Petition at 6.

[109] Theia Petition at 7-8.

[110] *Id*. at 8.

[111] *NetworkIP, LLC v. FCC*, 548 F.3d 116, 125-128 (D.C. Cir. 2008) (citing *Northeast Cellular Telephone Co.*, 897 F.2d 1164, 1166 (1990)).

[112] 47 CFR § 1.3.

[113] *WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969), *cert. denied*, 409 U.S. 1027 (1972) (*WAIT Radio*); *Northeast Cellular*, 897 F.2d at 1164, 1166 (D.C. Cir. 1990) (*Northeast Cellular*); *NetworkIP, LLC v. FCC*, 548 F.3d 116, 125-128 (D.C. Cir. 2008) (*NetworkIP*) (citing *Northeast Cellular Telephone Co.*, 897 F.2d 1164, 1166 (1990)).

[114] Kuiper Application, Legal Narrative at 1-2.

[115] Kuiper Jan. 27 *Ex Parte* at 21

[116] *Id*. at 22

processing round rules.[117] While the Commission in adopting this rule in the *NGSO FSS Order* recognized that multiple NGSO FSS systems can share spectrum, it reiterated the importance of processing rounds "to provide a measure of certainty in lieu of adopting an open-ended requirement to accommodate all future applicants."[118] The practical effect of adopting Kuiper's position would be to create an open-ended processing round in which new entrants would be placed on par with previously authorized systems and therefore fail to provide certainty to these systems as intended when establishing a processing round. This is contrary to the public interest goals of our processing round rules.[119] As in the present case, where multiple operators plan to share scarce spectrum resources, an open processing round approach would result in deteriorating investment environment resulting from uncertainty regarding spectrum availability.

43. There is nothing in the record for us to conclude that in the absence of a waiver, Kuiper faces any undue hardship, that Kuiper has been subjected to unfair processes, or that without this waiver Kuiper cannot provide the range of services it proposes. In fact, it appears Kuiper would be able to provide quality broadband service as a system authorized in a later processing round.[120] In light of the deficient showing here, we find that deviating from the policies behind our processing round rules would not serve the public interest. In view of all these points, we deny Kuiper's request for waivers of the processing round rules and find that treating Kuiper as part of the March 2020 NGSO Processing Round will serve the public interest.

44. As Kuiper notes, there are prior instances in which the International Bureau waived certain processing round rules.[121] Although these Bureau-level decisions are not binding on the Commission,[122] on alternative and independent grounds, we note that none of this Bureau-level precedent cited by Kuiper is on point to support the requested waiver of processing round rules. Kuiper argues that "not to initiate a processing round in response to the filing of Amazon's Kuiper System application would also be entirely consistent with FCC precedent."[123] Kuiper notes that what is material about these prior waivers is that they "stand for the simple proposition" that the Bureau will waive a processing round if it determines that a proposed system would not preclude entry of future entrants and can "coexist with other authorized systems,"[124] and that the promise of Kuiper's system and the substantial financial investment underway would be stifled if the Commission awarded the entire band to those who simply filed

[117] To the extent Kuiper contends that the section 25.261 spectrum sharing framework adopted in the *NGSO FSS Order* obviates the need for processing rounds, we reject this view. *See* Kuiper Application, Legal Narrative at 18. We agree with SES that had "the Commission intended for Section 25.261 to replace the processing round framework for NGSO applications, it would not have explicitly emphasized that only 'qualified applicants in a processing round' are entitled to rely on the 6% ΔT/T sharing framework, with future NGSO filings considered on a 'case-by-case' basis." SES Petition at 6 (quoting *NGSO FSS Order*, 32 FCC Rcd 7809 at 7829, para. 61). Moreover, as Telesat notes, if Kuiper's contention was correct, then the Commission in the *NGSO FSS Order* "would have eliminated Section 25.157(c), which establishes the processing round requirement for NGSO applications, or at least limited the applicability of Section 25.157(c) to NGSO systems that do not propose the use of directional antennas. Instead, the Commission left Section 25.157(c) untouched." Telesat Reply at 4.

[118] *NGSO FSS Order*, 32 FCC Rcd at 7829, para. 61.

[119] *See NGSO FSS Order*, 32 FCC Rcd at 7829, para. 61. (stating that "[t]he purpose of the recent processing rounds was to establish a sharing environment among NGSO systems, to provide a measure of certainty in lieu of adopting an open-ended requirement to accommodate all future applicants.").

[120] SpaceX Reply at 19.

[121] *See* Kuiper Application, Legal Narrative at 19-20.

[122] *See Comcast Corp. v. FCC*, 526 F.3d 763, 769 (D.C. Cir. 2008).

[123] Kuiper Application, Legal Narrative at 19.

[124] Kuiper Jan. 27 *Ex Parte* at 21-22.

paperwork first.[125] The problem for Kuiper is that in none of the cases cited was the processing round waived for an applicant that sought to be included as part of a closed processing round;[126] or an applicant whose entry raised interference concerns for earlier authorized operators; or an applicant whose system proposed deployment of thousands of satellites;[127] or reflected a situation where a waiver was granted after the Commission concluded that a system's ability to comply with the NGSO FSS sharing rules obviated the need for a processing round.[128] Our criteria for waiving a processing round is not as unequivocal as Kuiper represents. A later-flied applicant may be able to share with authorized systems and thus not preclude future entry, but that does not mean that investment expectations of prior authorized systems cannot be adversely affected or that the efficient administration of spectrum cannot be compromised by any future entrant. We believe it is important that we maintain the flexibility to evaluate the particulars in deciding whether to waive a processing round rather than restrict ourselves via a one-size-fits-all approach. Further, we do not grant processing round waivers routinely, rather we evaluate each waiver request on a case-by-case basis and determine whether, based on our review of the record in each case, deviating from the policies behind our processing round rules would serve the public interest. The practical effect of adopting Kuiper's position as a general rule would be to create an indefinitely open processing round in which new entrants would be placed on par with previously authorized systems and therefore fail to provide certainty to these systems as intended when establishing a processing round undermining the public interest benefits these rules aim to serve.[129] Here, Kuiper failed to show that a waiver is warranted and deviating from the policies behind our processing round rules would serve the public interest.

[125] *Id*. at 22-23.

[126] *See*, *e.g*., Northrop Grumman Space & Mission Systems Corporation, *Applications for Authority to Operate a Global Satellite System Employing Geostationary Satellite Orbit and Non-Geostationary Satellite Orbit Satellites in the Fixed-Satellite Service in the Ka-band and V-band*, Order and Authorization, 24 FCC Rcd 2330 (IB, 2009) (Northrop Grumman); DigitalGlobe, Inc., *Modification of Authorization to Construct, Launch and Operate a Remote-Sensing Satellite System*, Order and Authorization, 20 FCC Rcd 15696 (IB, 2005) (DigitalGlobe); Space Imaging, LLC, *Petition for Clarification of Amendment of the Commission's Space Station Licensing Rules and Policies*, Declaratory Order and Order and Authorization, 20 FCC Rcd 11964 (IB, 2005) (Space Imaging; Swarm Technologies, Inc., Application for Authority to Deploy and Operate a Non-Voice, Non-Geostationary Lower Earth Orbit Satellite System in the Mobile-Satellite Services, Memorandum Opinion, Order and Authorization, DA 19-1044, IBFS File No. SAT-LOA-20181221-00094 (IB, 2019); Lockheed Martin Corporation, *Application to Launch and Operate a Geostationary Orbit Space Station in the Radionavigation Satellite Service at 133° W.L.*, Order and Authorization, 20 FCC Rcd 11023 (IB, 2005) (Lockheed).

[127] Lockheed involved one satellite. Northrop Grumman involved three NGSO satellites and four GSO satellites. DigitalGlobe involved three NGSO satellites. Space Imaging involved one satellite. Swarm involved 150 satellites.

[128] For example, Northrop Grumman was the only remaining applicant from the 1997 processing round, the design of its system allowed for additional entrants, and its application was processed as if it had been filed on a first-come, first-served basis. The operating altitude for Northrop's system also reduced potential in-line interference, and if such interference occurred the system could switch to GSO satellite to avoid interference. In DigitalGlobe and Space Imaging, the Bureau waived the processing round requirement because both system applications could be considered under the first-come, first-served procedure because the Bureau determined that authorizing an Earth Exploration Satellite Service (EESS) licensee to operate in a particular frequency band does not preclude other EESS licensees from operating in that band and did not cause harmful interference to currently operating EESS systems using those frequencies.

[129] *See NGSO FSS Order*, 32 FCC Rcd at 7829, para. 61.

45. Additionally, we disagree with SES that Kuiper's request for a waiver of the processing round rules requires dismissal of Kuiper's application.[130] We find that the record in this proceeding is complete and contains sufficient information for us to evaluate Kuiper's application under our rules. The conditions we place on Kuiper's authorization will ensure that previously authorized Ka-band NGSO systems are protected.

46. *Section 25.261 Default Spectrum Sharing Framework*. In light of our decision to deny Kuiper's waiver request of our processing round rules and include Kuiper in the March 2020 Processing Round, we discuss below application of section 25.261 spectrum sharing framework to Kuiper. Section 25.261(c) of the Commission's rules states the procedure by which, absent coordination, NGSO FSS operators can resolve interference issues.[131] The Commission stated that it would "initially limit sharing under [25.261] to qualified applicants in a processing round."[132] Applicants or market access petitioners within the same processing round have equal status during coordination negotiations. With respect to applications or market access requests that might be filed outside of a processing round and whether such later-filed applications or market access requests would have equal negotiating status to previously authorized systems, the Commission stated such systems "must necessarily be examined on a case-by-case basis based on": (1) "the situation at the time"; (2) "the need to protect existing expectations and investments"; (3) the need to "provide for additional entry"; and (4) "any comments filed by incumbent operators and reasoning presented by the new applicant."[133] Within this framework, we conclude that Kuiper has not made a sufficient showing that its application warrants being treated on an equal basis with earlier authorized systems, independent of participation in the appropriate processing round.

47. First, when we examine the "situation at the time" and protecting investment expectations, we note that the Commission has authorized the operation of numerous Ka-band NGSO FSS systems in the two previous Ka-band NGSO FSS processing rounds.[134] Not all the authorized systems are at the same level of progress, but some have made substantial progress and, presumably, all are configuring their systems relying on an interference environment based upon the approved systems.

---

[130] *See* SES Reply at 3, 14-15 (stating that "[b]ecause the Commission must deny Kuiper's attempt to circumvent the processing round rules, it must also dismiss the Application, as its public interest showing assumes that Kuiper would not be required to protect previously authorized Ka-band NGSO systems. Nothing in the Application or the Opposition provides evidence that Kuiper could fulfill its business plan if its request to evade the processing round framework is rejected.").

[131] 47 CFR § 25.261(c).

[132] *NGSO FSS Order*, 32 FCC Rcd at 7829, para. 61.

[133] *Id.* at 7829, para. 61. Contrary to Kuiper's suggestion, *see* Kuiper Opposition at 6, 9, the Commission did not state nor infer that a later-filed application that proposes a system that uses directional antennas and can meet the default sharing requirement is automatically on equal footing with earlier authorized systems. *See NGSO FSS Order*. at 7825, para. 50 ("our default sharing solution sets all applicants *in a processing round* on an equal basis") (emphasis added).

[134] *See, e.g., Viasat, Inc. Petition for Declaratory Ruling Granting Access for a Non-U.S. Licensed Non-Geostationary Orbit Satellite Network,* Order and Declaratory Ruling, 35 FCC Rcd 4324 (2020); *O3b Limited, Request for Modification of U.S. Market Access for O3b Limited's Non-Geostationary Satellite Orbit System in the Fixed-Satellite Service and in the Mobile-Satellite Service*, Order and Declaratory Ruling, 33 FCC Rcd 5508 (2018); *Space Exploration Holdings, LLC, Application for Approval for Orbital Deployment and Operating Authority for the SpaceX NGSO Satellite System*, Memorandum Opinion, Order and Authorization, 33 FCC Rcd 3391 (2018) (*SpaceX Order*); *Telesat Petition for Declaratory Ruling to Grant Access to the U.S. Market for Telesat's NGSO Constellation*, Order and Declaratory Ruling, 32 FCC Rcd 9663 (2017); *WorldVu Satellites Limited, Petition for Declaratory Ruling Granting Access to the U.S. Market for the OneWeb NGSO FSS System*, Order and Declaratory Ruling, 32 FCC Rcd 5366 (2017).

This is not a situation where, for example, the Commission had authorized one or two systems and those systems had made minimal progress toward operation.

48. Second, when we consider the question of providing additional entry and consider comments from incumbents and Kuiper, we also find an insufficient basis to treat Kuiper on an equal basis with earlier authorized systems. Commenters argue treating Kuiper on an equal footing here would create uncertainty, thus undermining "existing expectations and investments" for systems filed in previous processing rounds.[135] Kuiper filed its application three years after the first Ka-band NGSO FSS processing round and did not demonstrate or attempt to demonstrate that it would be unable to offer services if not treated on par with systems authorized in the previous processing rounds. In response to Kuiper's analysis of how an interference environment without Boeing and LeoSat would enable accommodation of Kuiper's system, commenters rightfully ask how much of the benefit from the absence of Boeing and LeoSat should go to Kuiper rather than to operators of previous processing rounds.[136]

49. In the *NGSO FSS Order*, we stated our intent to set all NGSO FSS applicants and market access petitioners in a processing round on equal footing; that we believe coordination among NGSO FSS operators provides the best opportunity for efficient spectrum sharing; and that the Commission might intervene if the coordination discussions were not being conducted in good faith.[137] We also stated that we expected operators to negotiate in good faith with an aim to accommodating later-filed applicants.[138] Our expectation is that regardless of the sharing status of systems in different processing rounds, systems authorized in an earlier processing round may not withhold information necessary to effectuate good faith coordination to enable Kuiper to start operations. This would allow the most efficient and effective sharing of the spectrum and enable additional entry into the marketplace, consistent with our rules and policies.

50. We fully anticipate that all parties will negotiate in good faith, and Kuiper will be able to reach a coordination agreement with operators authorized in previous processing rounds. In the event this does not happen, Kuiper must make a showing demonstrating to the Commission that its operations will not cause harmful interference to any operational system licensed or granted U.S. market access in the July 2016 Processing Round and the May 2017 Processing Round. To commence operations in these bands, the Commission must approve Kuiper's demonstration as sufficient to show that Kuiper's NGSO system can operate without causing harmful interference to any operational systems in these processing rounds.

---

[135] *See, e.g.*, WorldVu at 11; Theia Reply at 2.

[136] *See, e.g.*, Theia notes that the Commission's rules do not contemplate that a later-filed applicant such as Kuiper can step into the place of systems that exit, and Kuiper's analysis does not account for the "environment-wide effects" of Kuiper's system. Theia Reply at 5. SES argues that it is not reasonable for Kuiper to perform an interference analysis that includes all the authorized systems because no one "reasonably expected" that all systems would deploy, and that given the amendments by SpaceX and OneWeb it is unrealistic to believe that no additional systems would enter. SES Reply at 13. SpaceX questions Kuiper's "reasonable expectations" claim by arguing that no applicants expected the type of interference environment Kuiper describes because no one expected all systems to deploy. SpaceX Reply at 5-6. SES further argues that without considering future entry, Kuiper cannot provide a realistic analysis of the interference environment for any future scenario. SES Reply at 14. SpaceX disagrees that Kuiper's 3,236 satellite system "could effectively squeeze into the space left by Boeing and LeoSat [who would have used the same spectrum sharing capabilities as Kuiper] without effect on the first-round interference baseline [and without increasing the number of in-line events]." SpaceX Reply at 8-9.

[137] *NGSO FSS Order*, 32 FCC Rcd at 7825, para. 48.

[138] *Id* at 7825, 7829, paras. 48, 61.

F. Other Waiver Requests

51. *Waiver Standard*. Kuiper seeks waivers of several of the Commission's rules.[139] Generally, the Commission may waive any rule for good cause shown.[140] Waiver is appropriate where the particular facts make strict compliance inconsistent with the public interest.[141] In making this determination, we may take into account considerations of hardship, equity, or more effective implementation of overall policy on an individual basis.[142] Waiver is therefore appropriate if special circumstances warrant a deviation from the general rule, such deviation will serve the public interest, and the waiver does not undermine the validity of the general rule.[143]

52. *Waiver Request to Provide FSS using Earth Stations in Motion (ESIMs)*. Kuiper requests a waiver of the U.S. Table and Ka-band plan to provide FSS to ESIMs using the 17.8-18.3 GHz, 18.3-18.6 GHz, 18.8-19.3 GHz, 19.3-19.4 GHz, 28.35-28.6 GHz, and 28.6-29.1 GHz bands.[144] We have rules in place to allow operations of GSO FSS communications with ESIMs[145] and recently adopted rules for ESIMs to communicate with NGSO satellites in specific frequencies allocated to the FSS.[146] Once the ESIM rules for NGSO systems become effective, specific applications for ESIM operations will be considered pursuant to Commission procedures pertaining to ESIMs. Therefore, we dismiss this waiver request as moot.

53. *Geographic Coverage Waiver*. Kuiper requests a waiver of section 25.146(b) of the Commission's rules which requires NGSO FSS operations in the 18.8-19.3 GHz and 28.6-29.1 GHz bands, among others, to provide a demonstration that the proposed system is capable of providing FSS on a continuous basis throughout the fifty states, Puerto Rico, and the U.S. Virgin Islands.[147] Kuiper states that the design of its system can meet the requirements of section 25.146(b) except as it applies to coverage for the majority of Alaska.[148]

54. We find that a grant of this waiver will serve the public interest.[149] With respect to the national coverage requirement, we recognize that several of the other NGSO FSS applicants intend to

---

[139] *See* n. 8, *supra*.

[140] 47 CFR § 1.3.

[141] *Northeast Cellular*, 897 F.2d at 1166.

[142] *WAIT Radio,* 418 F.2d at 1159; *Northeast Cellular*, 897 F.2d at 1166.

[143] *NetworkIP,* 548 F.3d at 125-28; *Northeast Cellular*, 897 F.2d at 1166; *WAIT Radio*, 418 F.2d at 1158.

[144] Kuiper Application, Legal Narrative at 22.

[145] *Amendment of Parts 2 and 25 of the Commission's Rules to Facilitate the Use of Earth Stations in Motion Communicating with Geostationary Orbit Space Stations in Frequency Bands Allocated to the Fixed-Satellite Service*, Report and Order and Further Notice of Proposed Rulemaking, 33 FCC Rcd 9327 (2018) (*ESIMs Report and Order* and *Further Notice*).

[146] *Amendment of Parts 2 and 25 of the Commission's Rules to Facilitate the Use of Earth Stations in Motion Communicating with Geostationary Orbit Space Stations in Frequency Bands Allocated to the Fixed-Satellite Service and Facilitating the Communications of Earth Stations in Motion with Non-Geostationary Orbit Space Stations*, Second Report and Order in IB Docket No. 17-95 and Report and Order in IB Docket No. 18-315 and Further Notice of Proposed Rulemaking, FCC 20-66 (May 14, 2020). Note, the Commission seeks further comment on ESIMS communicating with NGSO FSS systems in the 28.35-28.40 GHz band in the Further Notice of Proposed Rulemaking in this proceeding.

[147] Kuiper Application, Legal Narrative at 27-28. 47 CFR 25.146(b).

[148] Kuiper's system will cover areas between 56°N and 56°S latitudes.

[149] We note we have waived this requirement previously. *See Space Norway AS Petition for a Declaratory Ruling Granting Access to the U.S. Market for the Arctic Satellite Broadband Mission*, Order and Declaratory Ruling, 32 (continued….)

provide communications coverage to all U.S. states and territories, thereby mitigating concerns about Kuiper's lack of coverage to the majority of Alaska.[150] We do not believe it would serve the public interest to block access to Kuiper's system solely because it cannot serve all of Alaska given that multiple NGSO FSS systems plan to provide that coverage.

55. *Request for Waiver of Section 25.156(d)(4).* Section 25.156(d)(4) states, in pertinent part, that "applications . . . [for feeder-link] authority will be treated like an application separate from its associated service band" and each feeder-link request "will be considered pursuant to the procedure for applications for GSO-like operations or NGSO-like operation, as applicable."[151] Kuiper argues that there is no need for separate consideration of its proposed MSS feeder link operations because the Kuiper system can co-exist with other users and that separate consideration would cause unnecessary delay.[152] We find that the public interest would not be served by delaying action on Kuiper's application by opening a separate, further processing round for these MSS feeder-link bands and that, in this case, a waiver of section 25.156(d)(4) is justified with conditions imposed herein on Kuiper's operations. Moreover, the March 2020 Processing Round did not preclude other applicants from proposing the use of these bands for MSS feeder links. We believe that the more efficient and effective approach in this instance is to impose conditions on Kuiper's operation, requiring coordination with existing operators that have MSS feeder links in the bands requested by Kuiper to ensure protection of such systems. We have so conditioned Kuiper's use of MSS feeder link frequencies.

56. *Schedule S Waiver*. Kuiper states that it is unable to convey information required in section 25.114(c)(4)(v) regarding saturation flux density (SFD) values or Kuiper's use of spare satellites using Schedule S.[153] Kuiper states that its system processes signals prior to retransmission and there are no SFD values to disclose. Since the Schedule S software requires an input for SFD values, Kuiper states that it entered "0" and "-0.1" for maximum and minimum SFD values, respectively, and that all relevant information is provided in its Legal Narrative, Technical Appendix, and Schedule S.[154] In view of these limitations to fill in Schedule S and the fact that Kuiper has explained its system's parameters for these fields, we find that the requested relief would not undermine the policy objective of the rules in question and strict compliance with certain aspects of the Schedule S form would be inconsistent with the public interest.[155] Accordingly, we grant Kuiper's request and find that a waiver of the requirement to complete certain aspects or fields of Schedule S is warranted in this case.

G. Other Matters

57. *Radio Astronomy*. The transmission of out-of-band signals into allocated radio astronomy bands can cause interference to radio astronomy observations, especially for transmissions pointed directly to the radio astronomy site from satellites. While Kuiper does not intend to transmit in bands allocated for radio astronomy or immediately adjacent bands, the National Telecommunications and Information Administration (NTIA) notes that Kuiper should be made aware that radio astronomy as

(Continued from previous page)
FCC Rcd 9649 (2017). *See also O3b Limited*, Stamp Grant, IBFS File Nos. SAT-LOI-20141029-00118 and SAT-AMD-20150115-00004 (granted Jan. 22, 2015).

[150] *SpaceX Order* at 33 FCC Rcd. 3391, 3403-44, at para. 33; Space Norway AS, Petition for Declaratory Ruling Granting Access to the U.S Market for the Arctic Satellite Broadband Mission, 32 FCC Rcd 9649, 9658, para. 20 (2017).

[151] 47 CFR § 25.156(d)(4).

[152] Kuiper Application, Legal Narrative at 28-29.

[153] 47 CFR § 25.114(c)(4)(v). *See* Kuiper Application, Legal Narrative at 29.

[154] Kuiper Application, Legal Narrative at 29.

[155] *See generally*, *WAIT Radio,* 418 F.2d 1153; *see also Northeast Cellular Telephone Co*, 897 F.2d 1164, 1166.

a service frequently makes use of observations (passive) in bands not allocated to the radio astronomy service, including 17.7-18.6 GHz and 18.8-20.2 GHz. NTIA states that this practice is a result of scientifically valuable signals being subject, for example, to the Doppler Effect and shifted in frequency outside radio astronomy-allocated bands. Although not a condition to the authorization, Kuiper should be aware of these facts and contact the National Science Foundation Spectrum Management Unit (esm@nsf.gov) to assist with coordination and information on radio astronomy sites.

IV. ORDERING CLAUSES

58. Accordingly, IT IS ORDERED, that the Application filed by Kuiper Systems LLC (Kuiper) and accepted for filing, IS GRANTED IN PART, as set forth in this Order and Authorization, pursuant to Section 309(a) of the Communications Act of 1934, as amended, 47 U.S.C. § 309(a).

59. IT IS FURTHER ORDERED that this authorization is subject to the following requirements and conditions:

a) Prior to commencing operations in the 17.8-18.6 GHz and 18.8-20.2 GHz and 27.5-30 GHz bands, Kuiper must certify that it has completed a coordination agreement with or make a showing that it will not cause harmful interference to any operational system licensed or granted U.S. market access in the NGSO FSS processing rounds referred to in Public Notices DA 16-804, 31 FCC Rcd 7666 (IB 2016) and DA 17-524, 32 FCC Rcd 4180 (IB 2017).

b) Kuiper's operations must comply with spectrum sharing procedures among NGSO FSS space stations specified in 47 CFR § 25.261 with respect to any NGSO system licensed or granted U.S. market access pursuant to the March 2020 Processing Round initiated by Public Notice, DA 20-325. Spectrum sharing between Kuiper's operations and operations of NGSO systems granted U.S. market access, where such operations do not include communications to or from the U.S. territory, are governed only by the ITU Radio Regulations and are not subject to section 25.261.

c) Kuiper must timely provide the Commission with the information required for Advance Publication, Coordination, and Notification of the frequency assignment(s) for this constellation, including due diligence information, pursuant to Articles 9 and 11 of the ITU Radio Regulations. This authorization may be modified, without prior notice, consistent with the coordination of the frequency assignment(s) with other Administrations. *See* 47 CFR § 25.111(b). Kuiper is responsible for all cost-recovery fees associated with the ITU filings. 47 CFR § 25.111(d).

d) Operations in portions of the 17.8-18.6 GHz, 18.8-20.2 GHz, and 27.5-30 GHz bands, including MSS operations in the 19.7-20.2 GHz and 29.5-30 GHz bands, are authorized up to the applicable power flux-density and equivalent power-flux density limits contained in Articles 21 and 22, as well as Resolution 76 of the ITU Radio Regulations. In addition, operations must comply with the out-of-band emissions limits in 25.202(f), 47 CFR § 25.202(f).

e) Operations in the 19.3-19.4 GHz and 19.6-19.7 GHz (space-to-Earth) frequency bands are authorized up to the power flux-density limits in Article 21 of the ITU Radio Regulations that govern NGSO FSS systems in the 17.7-19.3 GHz (space-to-Earth) frequency band. Operations in the band 19.3- 19.4 GHz and 19.6-19.7 GHz are on a secondary basis with respect to the GSO FSS. Blanket authorized earth stations in the 19.3-19.4 GHz and 19.6-19.7 GHz bands operate on a secondary basis with respect to the fixed service.

f) Kuiper must cooperate with other NGSO FSS operators in order to ensure that all authorized operations jointly comport with the applicable limits for aggregate equivalent power flux density in the space-to-Earth direction contained in Article 22 of the ITU Radio Regulations, as well as Resolution 76 (WRC-03) of the ITU Radio Regulations.

g) Operations in the 17.7-17.8 GHz band are limited to service outside of the United States and must not cause harmful interference to nor claim protection from assignments in the broadcasting-

satellite service operating in conformity with the Radio Regulations, pursuant to 5.517 of the U.S. Table of Frequency Allocations.

h) Operations in the 17.8-18.3 GHz frequency band are on a secondary basis with respect to the fixed service.

i) Operations in the 19.3-19.7 GHz and 29.1-29.5 GHz bands must be coordinated with any previously authorized NGSO MSS systems not included in the March 2020 Processing Round over the bands designated for use by NGSO MSS feeder links. Until any coordination agreement required is obtained, operations shall not be conducted in these frequency bands. Sharing of the 19.3-19.7 GHz and 29.1-29.5 GHz bands with other systems authorized within the March 2020 Processing Round will be subject to section 25.261.

j) MSS operations in the 19.7-20.2 GHz and 29.5-30 GHz bands shall be conducted on a non-interference, non-protected basis with respect to other FSS operations in these bands.

k) Operations in the 27.5-28.35 GHz band are secondary with respect to Upper Microwave Flexible Use Service (UMFUS) operations, except for FSS operations associated with earth stations authorized pursuant to 47 CFR § 25.136.

l) In accordance with footnote NG62 to 47 CFR § 2.106, in the 28.5-29.1 GHz and 29.25-29.5 GHz bands, Kuiper shall not cause harmful interference to, or claim protection from, stations in the fixed service listed in that footnote.

m) Space-to-Earth operations in the 17.8-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz bands must complete coordination with U.S. Federal systems, in accordance with footnote US334 to the United States Table of Frequency Allocations, 47 CFR § 2.106, prior to being used. The use of space-to-Earth operations in the 17.8-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz bands must be in accordance with any signed coordination agreement between Kuiper and U.S. Federal operators. Two weeks prior to the start of any operations in the 17.8-18.6 GHz, 18.8-19.3 GHz, and 19.7-20.2 GHz bands, Kuiper must provide contact information for a 24/7 point of contact for the resolution of any harmful interference to Jimmy Nguyen, Email: Jimmy.Nguyen @us.af.mil.

60. IT IS FURTHER ORDERED that prior to initiation of service, Kuiper must receive a favorable or "qualified favorable" finding in accordance with Resolution 85 with respect to its compliance with applicable EPFD limits in Article 22 of the ITU Radio Regulations as per paragraph 26 above. Kuiper must communicate the ITU finding to the Commission and, in case of an unfavorable finding, adjust its operation to satisfy the ITU requirements. *See also* 47 CFR 25.146(c).

61. IT IS FURTHER ORDERED that Kuiper must make available to any requesting party the data used as input to the ITU approved validation software to demonstrate compliance with applicable EPFD limits.

62. IT IS FURTHER ORDERED that Kuiper must comply with the sharing of ephemeris data procedures described in section 25.146 of the Commission's rules. 47 CFR § 25.146(e).

63. IT IS FURTHER ORDERED that Kuiper must coordinate physical operations of spacecraft with any operator using similar orbits, for the purpose of eliminating collision risk and minimizing operational impacts. The orbital parameters specified in this grant are subject to change based on such coordination.

64. IT IS FURTHER ORDERED that upon finalization of its space station design and prior to initiation of service, Kuiper must seek and obtain the Commission's approval of a modification containing an updated description of the orbital debris mitigation plans for its system.

65. IT IS FURTHER ORDERED that this authorization and any earth station licenses granted in the future are subject to modification to bring them into conformance with any rules or policies adopted by the Commission in the future.

66. IT IS FURTHER ORDERED that:

a) Kuiper's request for waiver of the Ka-band plan to permit MSS operations in the 19.7-20.2 GHz and 29.5-30.0 GHz bands IS GRANTED for the reasons stated herein.

b) Kuiper's request for waiver of sections 25.157(c) and 25.155(b) is DENIED for the reasons stated herein.

c) Kuiper's request for waiver of the U.S. Table of Frequency Allocations and Ka-band plan to use the 17.7-17.8 GHz band for user beam downlinks outside the U.S. IS DISMISSED as MOOT for the reasons stated herein.

d) Kuiper's request for waiver of the U.S. Table of Frequency Allocations and Ka-band plan to use the 17.8-18.3 GHz, 18.3-18.6 GHz, 18.8-19.3 GHz, 19.3-19.4 GHz, 28.35-28.6 GHz, and 28.6-29.1 GHz bands to provide FSS using earth stations in motion IS DISMISSED as MOOT for the reasons stated herein.

e) Kuiper's request for waiver of section 25.146(b), 47 CFR § 25.146(b), concerning waiver of the geographic coverage requirement IS GRANTED for the reasons stated herein.

f) Kuiper's request for waiver of section 25.156(d)(4), 47 CFR § 25.156(d)(4), IS GRANTED for the reasons stated herein.

g) Kuiper's request for waiver of section 25.114(c)(4), 47 CFR § 25.114(c)(4), IS GRANTED for the reasons stated herein.

67. IT IS FURTHER ORDERED that this authorization is also subject to the following requirements:

a. Kuiper must post a surety bond in satisfaction of 47 CFR §§ 25.165(a)(1) & (b) no later than August 30, 2020, and thereafter maintain on file a surety bond requiring payment in the event of a default in an amount, at minimum, determined according to the formula set forth in 47 CFR § 25.165(a)(1); and

b. Kuiper must launch the space stations, place them in the assigned orbits, and operate them in accordance with this authorization and 47 CFR § 25.164(b). Section 25.164(b) requires Kuiper to launch and operate 50 percent of its satellites no later than July 30, 2026, and Kuiper must launch the remaining space stations necessary to complete its authorized service constellation, place them in their assigned orbits, and operate each of them in accordance with the authorization no later than July 30, 2029. 47 CFR § 25.164(b).

68. Failure to post and maintain a surety bond will render this authorization null and void automatically, without further Commission action. Failure to meet the milestone requirements of 47 CFR § 25.164(b) may result in Kuiper's authorization being reduced to the number of satellites in use on the milestone date. Failure to comply with the milestone requirement of 47 CFR § 25.164(b) will also result in forfeiture of Kuiper's surety bond. By August 14, 2026, Kuiper must either demonstrate compliance with its milestone requirement or notify the Commission in writing that the requirement was not met. 47 CFR § 25.164(f).

69. IT IS FURTHER ORDERED that the Petition to Dismiss or Defer of SES Americom, Inc. and O3b Limited IS DENIED.

70. IT IS FURTHER ORDERED that the Petition to Hold in Abeyance or Dismiss filed by Telesat Canada is DENIED.

71. IT IS FURTHER ORDERED that the Petition to Deny filed by Theia Holdings A, Inc. is DENIED.

72. IT IS FURTHER ORDERED that the Petition to Deny filed by WorldVu Satellites Limited is GRANTED to the extent that some of the conditions requested by WorldVu are imposed, as indicated herein, and is otherwise DENIED.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary