Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, DC 20554

In the Matter of	)	ICFS File Nos.:
	)	
ASTRA (GB) LIMITED	)	SAT-AMD-20260623-00250
	)	SAT-AMD-20220509-00048
Application to Modify U.S. Market Access Grant for the O3b Satellite System	)	SAT-MOD-20200526-00058
	)	
	)	Call Sign: S2935
	)	
INTELSAT LICENSE, LLC	)	SAT-PPL-20211104-00146
	)	SAT-APL-20230405-00072
Petition for Declaratory Ruling Granting Access to the U.S. Market for a Non-U.S.-Licensed Non-Geostationary Orbit Satellite System	)	Call Sign: S3106

AMENDMENT

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AMENDMENT

ASTRA (GB) Limited, the successor-in-interest to O3b Limited (together, "SES"), hereby amends its pending application to modify its U.S. market access authorization for the O3b medium Earth orbit ("MEO") non-geostationary satellite constellation (the "Amendment").[1] This Amendment presents a revised, next-generation MEO constellation design ("O3bGEN3") that seeks to combine the Ka-band of the O3b constellation with the V-band of the Intelsat MEO

[1] *See* O3b Limited, ICFS File Nos. SAT-MOD-20200526-00058 & SAT-AMD-20220509-00048, Call Sign S2935; *see also Space Bureau Opens Processing Rounds: Cut-Off Established for Additional NGSO-Like Satellite Systems in the Ku- and Ka-Bands and V-Band*, Public Notice, DA 26-552 (SB rel. June 5, 2026); *Satellite Policy Branch Information: Cut-Off Established for Additional NGSO FSS Applications or Petitions for Operations in the 10.7-12.7 GHz, 12.75-13.25 GHz, 13.8-14.5 GHz, 17.7-18.6 GHz, 18.8-20.2 GHz, and 27.5- 30.0 GHz Bands*, Public Notice, 35 FCC Rcd 2881 (IB 2020) ("*2020 Ku-/Ka-band Processing Round*"). In 2025, O3b Limited, a wholly owned subsidiary of SES S.A., assigned its U.S. market access grant and associated amendments to ASTRA (GB) Limited, another wholly owned subsidiary of SES S.A. *See* ICFS File No. SAT-MOD-20250430-00114 (granted July 27, 2025).

Constellation, the rights to which SES acquired in 2025.[2] Specifically, the O3bGEN3 constellation would: (1) add 72 satellites in multiple inclined planes and two satellites in the Equatorial plane to the existing O3b network; (2) operate in both the Ka- and V-band frequencies[3] to support Fixed-Satellite Service ("FSS"), Mobile-Satellite Service ("MSS"), and satellite-to-satellite operations; and (3) unify the orbital altitudes of all spacecraft in all planes at a nominal 8,062 kilometers. The O3bGEN3 constellation will also utilize optical inter-satellite links, enhancing network security and resilience.

SES will operate the O3bGEN3 constellation under the existing International Telecommunication Union ("ITU") filings for O3b (covering the existing Equatorial Ka-band constellation), as well as new ITU filings submitted by Luxembourg (covering the Ka-/V-band satellites in inclined planes and an expanded Ka-band constellation in the Equatorial plane). The technical parameters of the O3bGEN3 system presented in this Amendment replace the parameters previously presented in the pending O3b modification application and the pending Intelsat MEO Constellation application.

The proposed changes in this Amendment will allow SES to respond to growing demand from Internet service providers, fixed and mobile network operators, large enterprises, and governments for low-latency, high-throughput satellite capacity that enables fast, flexible and affordable broadband connectivity in locations unserved or underserved by terrestrial networks.

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[2] *See* Intelsat License LLC, File Nos. SAT-PPL-20211104-00146, SAT-APL-20230405-00072, Call Sign S3106 ("Intelsat MEO Constellation"); *see also Satellite Polic Branch Information; Cut-Off Established for Additional NGSO-Like Satellite Systems in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz, and 50.4-51.4 GHz Bands*, Public Notice, 36 FCC Rcd 12148 (IB 2021) ("*2021 V-band Processing Round*"). In 2025, SES S.A. acquired control of Intelsat, including the pending Intelsat MEO Constellation application. *See Applications of SES S.A. and Intelsat S.A. For Consent to Transfer Control of Licenses and Authorizations*, Memorandum Opinion and Order, 40 FCC Rcd 4919 (SB/WTB/OET 2025) ("*SES-Intelsat Order*").

[3] The two Equatorial satellites would operate only in the Ka-band.

The expanded constellation will also enable SES to better serve satellite mobility customers, such as major cruise lines and airlines,[4] and to expand commercial space-to-space relay services.[5] Grant of this Amendment will allow SES to build on its proven record of meeting customer requirements for high-quality, cost-effective satellite services and will therefore serve the public interest.

I. INTRODUCTION AND SUMMARY

O3b began providing global service in or about August 2014 with an initial constellation of 8 satellites in MEO.[6] Since then, the constellation has grown to 30 first- and second-generation satellites, with 3 more launching later in 2026. In 2020, following SES's acquisition of O3b, SES submitted a modification application for O3b's market access grant to propose a next-generation MEO constellation, which it subsequently amended in 2024. In 2025, SES acquired Intelsat, which also had a pending application for a Ku- and V-band Intelsat MEO Constellation. Today, SES files this Amendment to propose a revised next-generation O3bGEN3 constellation that combines the Ka- and V-band aspects of the 2020 O3b modification

[4] *See, e.g., 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 et al.*, Second Report and Order et al., 35 FCC Rcd 5137 ¶ 2 (2020) ("Although FSS traditionally involves communications between satellites in orbit and earth stations in fixed locations, the growing demand for broadband communications to vessels, land vehicles, and aircraft has resulted in increased use of FSS for mobility applications.").

[5] *See* ITU Resolution 679 (WRC-23); ITU Radio Regulations No. 5.521A (WRC-23).

[6] *See Satellite Communications Services Information, re Actions Taken*, Public Notice, Report No. SES-01681 (IB rel. Sept. 10, 2014) (determining that O3b had met its milestone condition of bringing eight satellites of its NGSO constellation into operation); *see also 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 ¶ 2 (2018) ("*O3b Market Access Grant*").

application (as amended) and 2021 Intelsat MEO Constellation application (as amended), respectively.[7]

To meet evolving customer demand, the revised O3bGEN3 constellation will add capacity and coverage to the existing O3b fleet by adding satellites in inclined orbital planes and expanding the number of satellites in the Equatorial plane. The additional satellites will communicate with user terminals using the Ka-band frequencies and with gateway earth stations using both Ka- and V-band frequencies. The new satellites will also have optical inter-satellite links.[8] Technical information regarding the proposed operations appears in Schedule S and the Technical Annex.

SES's proposed operations will give U.S. customers access to an expanding range of service capabilities, foster enhanced competition that promotes new technologies and disciplines pricing, and contribute to the efficient use of spectrum to address marketplace demands.

[7] SES no longer intends to pursue the Ku-band aspects of the Intelsat MEO Constellation application.

[8] Optical links fall outside the Commission's radio spectrum licensing framework. *See Teledesic LLC*, 14 FCC Rcd 2261 ¶ 14 (IB 1999) ("Because optical [inter-satellite links ("ISLs")] do not involve wire or radio frequency transmissions, the Commission does not have jurisdiction over the use of optical ISLs."). To the extent necessary, SES commits to coordinating with Department of Defense Laser Clearinghouse, including by registering its optical links and implementing risk mitigation. The Clearinghouse seeks to ensure that DOD laser activities in space are conducted in a safe and responsible manner. *See* U.S. Department of Defense, DoD Instruction 3100.11, Management of Laser Illumination of Objects in Space § 1.1 (Oct. 24, 2016), https://www.esd.whs.mil/Portals/54/Documents/DD/issuances/dodi/310011_dodi_2016.pdf (limiting applicability to DoD owned, leased, or operated lasers and spacecraft).

II. PROCESSING ROUND STATUS

As noted above, this Amendment combines the still-pending applications filed by SES and its affiliate Intelsat License LLC.[9] O3b timely-filed a request to modify its U.S. market access authorization for consideration in the Commission's 2020 Ku-/Ka-band NGSO processing round.[10] That request for modification remains pending and is incorporated into this Amendment.[11] This Amendment also incorporates Intelsat's timely-filed application for a V-band NGSO system filed in the 2021 V-band processing round.[12] SES asks that the frequencies requested in those timely-filed applications remain part of the 2020 Ku-/Ka-band and 2021 V-band processing rounds, respectively. For the reasons set out in Section IV.D below, the proposed changes in this Amendment do not constitute "major" amendments to the previously filed applications and, therefore, should not be considered a "newly filed" application. Of course, to the extent that the Amendment seeks authority for frequencies that were not previously sought or that were not part of the 2020 Ku-/Ka-band or 2021 V-band processing rounds, such frequencies would become part of the Commission's 2026 processing round.

The frequencies for the O3bGEN3 system and their associated processing round status are summarized in Table 1.

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[9] As discussed below, neither this Amendment nor any of the amendments previously filed by O3b or Intelsat should be considered a major amendment under the Commission's rules. *See infra* Section IV.D; *see also* 47 C.F.R. § 25.116.

[10] *See* Application of O3b Limited, ICFS File No. SAT-MOD-20200526-00058 (filed May 26, 2020) ("Modification Application"); *see also 2020 Ku-/Ka-band Processing Round*.

[11] *See* Modification Application. O3b amended the Modification Application twice in response to FCC requests. *See* ICFS File Nos. SAT-AMD-20220509-00048, SAT-AMD-20241122-00267.

[12] *See* Application of Intelsat License, LLC, ICFS File No. SAT-PDR-20211104-00146 (filed Nov. 4, 2021); *see also 2021 V-band Processing Round*. Intelsat amended its application in 2023 to add Ku-band frequencies. *See* ICFS File No. SAT-APL-20230405-00072. SES does not request access to the Ku-band in this Amendment.

Table 1: Frequency Plan[13]

Frequency (GHz)	Direction	Processing Round
17.3-17.7	space-to-Earth	2026
17.7-17.8	space-to-Earth	2017,[14] 2026 Ku-/Ka-band
17.8-18.3	space-to-Earth	2020 Ku-/Ka-band
18.3-18.6	space-to-Earth	2020 Ku-/Ka-band
18.6-18.8	space-to-Earth	2026
18.8-19.3	space-to-Earth	2020 Ku-/Ka-band
19.3-19.4	space-to-Earth	2020 Ku-/Ka-band
19.4-19.6	space-to-Earth	2020 Ku-/Ka-band
19.6-19.7	space-to-Earth	2020 Ku-/Ka-band
19.7-20.2	space-to-Earth	2020 Ku-/Ka-band
27.5-28.35	Earth-to-space	2020 Ku-/Ka-band
28.35-28.6	Earth-to-space	2020 Ku-/Ka-band
28.6-29.1	Earth-to-space	2020 Ku-/Ka-band
29.1-29.5	Earth-to-space	2020 Ku-/Ka-band
29.5-30.0	Earth-to-space	2020 Ku-/Ka-band
37.5-40.0	space-to-Earth	2021 V-band
40.0-42.0	space-to-Earth	2021 V-band
47.2-48.2	Earth-to-space	2021 V-band
48.2-51.4	Earth-to-space	2021 V-band

In addition to seeking authorization for the above frequency bands on the 74 new satellites in O3bGEN3, this Amendment also seeks to add frequency bands to the "O3bN" Equatorial satellites in SES's existing authorized NGSO constellation.[15] *First*, as part of the 2017 Ku-/Ka-band processing round, SES had requested authorization to operate in the 17.7-17.8 GHz band. The International Bureau deferred action on that request.[16] Since then, the band has

[13] SES requests access to all frequency bands consistent with the U.S. Table of Allocations, except as addressed in Section IV.

[14] See discussion immediately following Table 1 regarding processing round status.

[15] These satellites, referred to as "O3bN" in the *O3b Market Access Grant*, appear in the Technical Annex as Satellites 21-32. *See* Technical Annex at 1; *O3b Market Access Grant* ¶¶ 4-6.

[16] *O3b Market Access Grant*, at n.10 ("O3b also requested use of the 17.7-17.8 GHz band. The Satellite Policy Branch deferred its determination on the acceptability for filing of the 17.7-17.8 GHz band because it is limited to feeder links for the broadcasting-satellite service.").

been allocated for NGSO FSS downlinks,[17] so SES again requests access to that spectrum here. SES is requesting earlier round status for the 17.7-17.8 GHz band for the O3bN satellites based on its previous request;[18] however, this frequency band on the additional satellites described in this Amendment would be part of the 2026 processing round. *Second*, SES also seeks FCC authority to add the 18.6-18.8 GHz band to the O3bN space stations in its existing authorization (in addition to the 74 new satellites that are the subject of this Amendment). The O3bN satellites are capable of operating in this band, but SES has not previously sought authorization for this band. As a result, SES's request to use this band for all relevant satellites should be part of the 2026 processing round. As noted below in Section IV.A.1, SES's proposed use of this band would be a non-conforming use, and thus operations would be on a non-interference, non-protected basis.

SES's proposed operations will give U.S. customers access to an expanding range of service capabilities, foster enhanced competition that promotes new technologies and places downward pressure on pricing, and contribute to the efficient use of spectrum to address marketplace demand.

III. SES WILL CONTINUE TO SATISFY THE *DISCO II* REQUIREMENTS (47 C.F.R. § 25.137)

SES complies with Section 25.137(e) and (f) of the Commission's rules, which set forth the requirements for seeking amendments and modifications to U.S. market access

[17] 47 C.F.R. § 2.106.

[18] If the Commission determines that it cannot grant first-round status for these twelve satellites, SES requests that it include this band for those satellites in this Amendment in the 2020 Ku-/Ka-band processing round, based on the showings in this Amendment and SES's previously filed request, on which the Commission deferred acting. *See supra* note 16.

authorizations.[19] SES demonstrates in this filing that grant of its request to add satellites and functionalities to its system would be consistent with Commission rules and policies, consistent with the Commission's waiver precedents, and in the public interest. As a result, SES's request for a market access modification, as amended, should be granted.

As established in its *DISCO II* proceeding, the Commission considers the effect on competition in the United States; eligibility and operational requirements; concerns related to national security, law enforcement, foreign policy, and trade; and spectrum availability when evaluating a request for U.S. market access.[20] The Commission has previously determined that authorizing the O3b constellation to serve U.S. customers is consistent with applicable precedent,[21] and the addition of satellites and operating capabilities proposed herein does not alter the *DISCO II* analysis.

Effect on competition in the United States. The proposed expansion of SES's system will enhance competition in the United States by enabling O3b to add capacity and compete more effectively. In any event, under the *DISCO II* framework, allowing satellites licensed by World Trade Organization ("WTO") member countries to serve the U.S. is presumed to be pro-competitive, absent a showing to the contrary.[22] In this case, the O3bGEN3 constellation (which includes the existing O3b constellation) will be authorized and operated under the ITU filings submitted by WTO member countries (the United Kingdom, France, and Luxembourg).

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[19] *See* 47 C.F.R. § 25.137(e)-(f).

[20] *See Amendment of the Commission's Regulatory Policies to Allow Non-U.S. Licensed Space Stations to Provide Domestic and International Satellite Service in the United States*, Report and Order, 12 FCC Rcd 24094 ¶ 7 (1997) ("*DISCO II Order*").

[21] *See O3b Market Access Grant* at n.35.

[22] *See DISCO II Order* ¶ 29.

Eligibility and operational requirements. The information set forth in this legal narrative, the attached Technical Annex, Schedule S, and the accompanying FCC Form 312 demonstrate that O3b's proposed addition of satellites and capabilities conforms to the Commission's legal and technical qualification requirements for holders of space station authorizations.

Concerns related to national security, law enforcement, foreign policy, and trade. SES's prior granted applications for U.S. market access raised no national security, law enforcement, foreign policy, or trade issues, and the addition of satellites, frequencies, and functionalities do not present any new concerns in these areas.[23]

Spectrum availability. The proposed operation of the O3bGEN3 system does not implicate spectrum availability under the *DISCO II* framework[24] because it will not create the potential for harmful interference with U.S.-licensed satellite and terrestrial systems. In the *O3b Market Access Grant*, the Commission determined that the O3b system, operating in conformance with the terms and conditions specified in the decision, will adequately protect U.S.-licensed satellite and terrestrial systems from interference.[25] In the Technical Annex that is included with this filing, SES supplements its prior showing on these matters to address the proposed addition of satellites and functionalities to its system. The Technical Annex explains that:

- SES's expanded system will continue to comply with relevant Commission and ITU power flux density ("PFD") limits developed to ensure that satellite downlink transmissions do not adversely affect terrestrial services.

[23] *See SES-Intelsat Order* ¶¶ 65-67.

[24] *See DISCO II Order* ¶¶ 149-50.

[25] *See, e.g., O3b Market Access Grant* ¶ 21.

- SES's expanded system will continue to comply with the applicable FCC rules for the protection of Geostationary Satellite Orbit ("GSO") systems from unacceptable interference from co-frequency NGSO systems.[26]
- SES will continue to rely on Commission-approved approaches to manage any in-line interference events with other NGSO satellite systems.[27]
- SES will comply with rules adopted in the *Spectrum Frontiers* proceeding[28] regarding sharing with Upper Microwave Flexible Use Service operations as required.[29]
- SES will comply with Commission requirements for sharing with other authorized users of MSS feeder link spectrum.
- Coordination with U.S. government satellite networks under footnote US334 of the U.S. Table of Frequency Allocations was previously completed for the first-generation O3b MEO system, and SES will seek revisions to the agreement to reflect the changes proposed herein.
- SES's proposed satellite-to-satellite operations will not create harmful interference to authorized users of the requested frequency bands.

Accordingly, grant of SES's Amendment is consistent with Commission policies designed to protect U.S.-licensed satellite and terrestrial systems.

IV. WAIVER REQUESTS

The Commission may waive any of its rules for "good cause."[30] Waiver is appropriate when (1) special circumstances warrant a deviation from the general rule and (2) such deviation

[26] *See, e.g.*, 47 C.F.R. § 25.146(a) (for Ka-band); ITU Radio Regulations, Art. 22, Nos. 22.5L, 22.5M (for V-band). In the future, SES may seek to operate under the Commission's modernized NGSO/GSO spectrum sharing framework for Ka-band frequencies. *See Modernizing Spectrum Sharing for Satellite Broadband*, SB Docket No. 25-157, Report and Order, FCC 26-26 (rel. May 1, 2026).

[27] *See Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems*, Second Report and Order and Order on Reconsideration, 39 FCC Rcd 12656 (2024).

[28] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services*, Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd 8014 (2016).

[29] The Commission is currently considering updates to these requirements. *See Facilitating More Intensive Use of Upper Microwave Spectrum*, Notice of Proposed Rulemaking, 40 FCC Rcd 8401(2025). SES commits to compliance with any rule changes adopted in this proceeding.

[30] *See* 47 C.F.R. § 1.3; *Ne. Cellular Tel. Co. v. FCC*, 897 F.2d 1164, 1166 (D.C. Cir. 1990); *see also WAIT Radio v. FCC*, 418 F.2d 1153, 1159 (D.C. Cir. 1969).

will serve the public interest better than strict adherence to the rule.[31] In general, the Commission will grant a waiver of its rules if the relief requested would not undermine the policy objective of the rule in question and would otherwise serve the public interest.[32] Good cause exists to waive the following rules to the extent necessary, and grant of this Amendment would be consistent with Commission precedent for the reasons set out below.

A. 47 C.F.R. §§ 2.102(a) (Frequency Assignments), 2.106 (International and U.S. Non-Federal Frequency Allocation Tables)

SES seeks a waiver to use certain frequency bands on a non-conforming basis with the International Table of Frequency Allocations and/or the U.S. Table of Frequency Allocations.[33] Such relief is attainable "when there is little potential for interference into any service authorized . . . and when the non-conforming operator accepts any interference from authorized users."[34] All proposed bands will be operated consistent with the International and U.S. Tables of Frequency Allocation, except where a waiver is specifically requested in the following sub-sections.

1. 18.6 – 18.8 GHz

SES proposes to use the 18.6-18.8 GHz band for downlink FSS transmissions and seeks a waiver of the U.S. and International Tables of Frequency Allocation to do so on a non-

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[31] *See Ne. Cellular*, 897 F.2d at 1166.

[32] *See WAIT Radio*, 418 F.2d at 1157.

[33] Section 2.102(a) requires that the assignment and actual use of frequencies be consistent with the Table of Frequency Allocations absent an applicable exception. Section 2.106 requires that frequencies be allocated according to what is listed in the Table of Frequency Allocations, which includes the International Table of Frequency Allocations and the U.S. Table of Frequency Allocations.

[34] *The Boeing Company*, Order and Authorization, 16 FCC Rcd 5864 ¶ 9 (IB/OET 2001) (internal punctuation omitted). *See generally Fugro-Chance, Inc.*, Order and Authorization, 10 FCC Rcd 2860 (IB 1995); *Motorola Satellite Communications, Inc.*, Order and Authorization, 11 FCC Rcd 13952 (IB 1996).

interference, non-protected basis in the United States. Specifically, SES seeks FCC authorization to use this spectrum band both in the O3bGEN3 system and with the twelve "O3bN" satellites of the previously authorized O3b constellation.[35]

The 18.6-18.8 GHz band has been allocated globally for FSS (downlink) on a co-primary basis, currently limited to (1) GSO operations under footnote NG164 of the U.S. Table of Frequency Allocations and (2) GSO and NGSO systems with an orbit of apogee greater than 20,000 km under ITU Radio Regulations No. 5.522B.[36]

Granting a waiver to allow SES to operate downlinks in the 18.6-18.8 GHz band on a non-interference, non-protected basis in the United States would enable the O3bGEN3 system to make more efficient, contiguous use of Ka-band spectrum to deliver high-throughput, low-latency satellite broadband and robust backhaul services to U.S. customers. From a technical and operational perspective, grant of the requested waiver would permit SES to incorporate the 18.6-18.8 GHz band into an integrated Ka-band payload architecture that already includes adjacent downlink spectrum, thereby improving spectrum efficiency, capacity, and network flexibility. The Commission has recently granted waivers to authorize SpaceX and Amazon LEO to operate in this band for similar purposes and should do so again here.[37] Outside of the United States, SES would comply with applicable ITU and national requirements in this band.

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[35] Concerning the addition of the 18.6-18.8 GHz band to the existing O3b network, SES seeks FCC authorization to incorporate this spectrum into the "O3bN" portion of the constellation, which comprises "[t]welve satellites . . . [that] operate in a circular equatorial orbit at an altitude of 8,062 km." *O3b Market Access Grant* ¶ 18; *see also supra* Section II (discussing SES's requested frequencies and processing round status).

[36] 47 C.F.R. § 2.106, nn.NG164 & 5.522B.

[37] *Space Exploration Holdings, LLC Request for Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System*, ICFS File No. SAT-LOA-20200526-00055 et al., Authorization and Order, DA 26-36, at Condition 3(a) (SB rel. Jan. 9, 2026) ("*SpaceX Gen2 Upgrade Order*"); *Kuiper Systems LLC*, Stamp Grant, ICFS File Nos. SAT-LOA-20211104-

2. 19.3 – 19.7 GHz

SES proposes to use the 19.3-19.7 GHz band for downlink transmissions from the O3bGEN3 system. Under the U.S. Ka-band Plan, NGSO FSS downlink use of the 19.3-19.4 GHz and 19.6-19.7 GHz band segments is secondary to GSO FSS systems, while use of the 19.4-19.6 GHz band in the United States is limited to feeder links for NGSO systems in the MSS.[38] Internationally, the 19.3-19.7 GHz band is allocated to FSS on a co-primary basis, and NGSO use of the 19.3-19.6 GHz band for MSS feeder links is subject to Article 9.11A of the Radio Regulations.[39]

SES's proposed use of the 19.3-19.7 GHz band will support an integrated NGSO system architecture capable of providing FSS and MSS connectivity through a common MEO platform. To the extent SES uses the band for MSS feeder-link operations (*e.g.*, when connected to a terminal in 29.5-30.0 GHz, which has an MSS allocation), that use would conform to the U.S. Table of Frequency Allocations. But SES can make more efficient and productive use of the band by also using the same downlink spectrum to support FSS operations. As a practical matter, MSS feeder-link traffic and general FSS traffic can be carried through the same satellite and earth station infrastructure without creating materially different interference characteristics than if the spectrum were used solely for MSS feeder links.[40]

00145 and SAT-AMD-20250311-00068, at Condition 2(a) (SB rel. Feb. 10, 2026) ("*Amazon Gen2 and Polar Authorization*").

[38] *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) ("*Ka-band Plan*").

[39] 47 C.F.R. § 2.106, n.5.523B.

[40] *See O3b Market Access Grant* ¶ 22.

Accordingly, SES seeks a waiver of the Ka-band Plan and the U.S. Table of Frequency Allocations to the extent necessary to permit NGSO FSS operations in the 19.3-19.7 GHz band. Granting the waiver would enable more efficient network planning, spectrum utilization, and resource allocation across the O3bGEN3 system while preserving protection for authorized users. SES will operate pursuant to any waiver on a non-interference, non-protected basis relative to primary licensed operations, including GSO FSS networks, and will coordinate with other users in the band as necessary. SES also will comply with applicable PFD limits for the 19.3-19.7 GHz band.[41] The Commission has previously granted waivers on a similar basis for NGSO FSS systems to use this band in this manner.[42]

SES has already coordinated with Iridium with respect to the existing O3b system and will provide Iridium with analysis to demonstrate compatibility of the O3bGEN3 system with Iridium. Pursuant to § 25.203(k), SES understands that, in order to receive authorization by the Commission to operate earth stations in the band segments Iridium uses, SES will have to demonstrate that it will not cause unacceptable interference to the Iridium system or certify that it will conform to established coordination agreements. SES also recognizes that non-conforming FSS use of the band would be on a non-interference, non-protected basis.[43]

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[41] *See* 47 C.F.R. § 25.146(a).

[42] *See, e.g.*, *O3b Market Access Grant* ¶ 23; *pet. for partial reconsideration denied, 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*, Memorandum Opinion and Order, 35 FCC Rcd 1631 (2020) ("*O3b Recon Order*"); *see also SpaceX Gen2 Upgrade Order* at Condition 3(d).

[43] *See SpaceX Gen2 Upgrade Order*, at Condition 3(e).

3. 19.7 – 20.2 GHz and 29.5 – 30.0 GHz

SES proposes to use the 19.7-20.2 GHz and 29.5-30.0 GHz bands for MSS operations as well as FSS. Although an MSS allocation exists in the U.S. Table of Allocations for this band, the Commission's Ka-band Plan omits MSS.[44] SES therefore requests a waiver of the Ka-band Plan, to the extent necessary. Its proposed MSS operations will have the same characteristics as its proposed FSS operations in the band.[45] Accordingly, the MSS operations will comply with the same spectrum sharing conditions that apply to FSS and minimize the potential for interference to authorized FSS systems.[46] SES commits to conduct MSS operations on an unprotected and non-interference basis.[47] The Commission has previously granted waivers of the Ka-band Plan to allow NGSO FSS systems to provide MSS in this band on this basis.[48]

4. 29.1 – 29.5 GHz

SES proposes to use the 29.1-29.5 GHz band for uplink transmissions to the O3bGEN3 system, both as feeder links for MSS operations and to support FSS operations. Under the U.S. Ka-band Plan, FSS uplink use of the 29.1-29.25 GHz band is limited to NGSO MSS feeder links,

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[44] *Compare* 47 C.F.R. § 2.106 *with Ka-Band Plan* ¶¶ 9-10.

[45] *See O3b Market Access Grant* ¶ 22 ("Although Iridium argues that we should deny O3b's operations as inconsistent with the Ka-band plan, given the existing MSS allocations and the fact that O3b's proposed operations have the same characteristics as those in a NGSO FSS system—a designated usage under the Ka-band plan—we find it in the public interest to grant O3b U.S. market access to operate in this band and waive the Ka-band plan to the extent necessary on our own motion.").

[46] *See O3b Market Access Grant* ¶ 23; *SpaceX Gen2 Upgrade Order*¶ 12 ("Consistent with SpaceX's commitments in its application, we find good cause to grant the requested waiver and require SpaceX to operate its MSS communications with the same technical characteristics as its FSS operations to minimize risk of interference to other systems.").

[47] *SpaceX Gen2 Upgrade Order* ¶ 12.

[48] *Id*. *See also O3b Market Access Grant* ¶ 22-23; *Amazon Gen2 and Polar Authorization* at Condition 2(d).

while use of the 29.25-29.5 GHz band is shared on a co-primary basis between GSO FSS uplinks and NGSO MSS feeder links (uplink).[49] Internationally, the band is allocated to FSS (uplink) on a co-primary basis but is similarly limited to feeder links for NGSO systems in the Mobile-Satellite Service and to geostationary satellite systems, subject to Article 9.11A of the Radio Regulations.[50]

As with the 19.3-19.7 GHz band, SES can make more efficient and productive use of the 29.1-29.5 GHz band by using it both for MSS feeder-link operations (*e.g.*, when connected to a terminal in the 19.7-20.2 GHz band, which has an MSS allocation) and to support FSS uplink operations. As a practical matter, MSS feeder-link traffic and general FSS traffic can be transmitted through the same integrated MEO satellite and earth station infrastructure without creating materially different interference characteristics than if the spectrum were used solely for MSS feeder links.[51] Permitting SES to use available capacity in the band for FSS uplinks as well as for MSS feeder links would therefore promote more efficient network planning, spectrum utilization, and resource allocation across the O3bGEN3 system. The Commission has previously authorized O3b to access the 29.1-29.5 GHz band for NGSO MSS feeder links[52] and waived the Ka-band Plan to allow other NGSO systems to use this band for FSS.[53]

SES's proposed operations also will protect authorized users of the band. SES will employ uplink adaptive power control or other appropriate fade-compensation techniques so that

[49] *Ka-band Plan* at Appendix B.

[50] 47 C.F.R. § 2.106, n.5.535A.

[51] *See O3b Market Access Grant* ¶ 22.

[52] *O3b Market Access Grant* ¶ 23; *O3b Recon Order* (denying petition for partial reconsideration of the *O3b Market Access Grant*).

[53] *See, e.g., SpaceX Gen2 Upgrade Order* at Condition 3(d).

earth station transmissions are conducted at the power level necessary to achieve desired link performance while reducing the potential for mutual interference. SES's use of highly directional, independently steerable beams and frequency-reuse capabilities will further support efficient sharing with current and future authorized users. Accordingly, SES seeks a waiver of the Ka-band Plan and the U.S. and International Tables of Frequency Allocations to the extent necessary to permit NGSO FSS operations in the 29.1-29.5 GHz band. SES will operate pursuant to any waiver on a non-interference, non-protected basis relative to primary licensed operations and will coordinate with authorized operators in the band as needed to ensure ongoing operations are protected. As noted in the preceding subsection, SES would coordinate its operations with Iridium, and FSS use of the band would be on a non-interference, non-protected basis.[54]

B. 47 C.F.R. § 25.112 (Application Completeness)

The Commission may dismiss an application if the submission contains incomplete information or internal inconsistencies.[55] Even in these cases, however, the Commission's rules provide that the Commission may accept a defective application if accompanied by an appropriate waiver request.[56] SES requests a waiver of this rule and asks the Commission to permit SES to supplement its application if additional information or explanation is necessary. Granting this waiver would avoid unduly harsh results given that no regulatory framework properly captures the proposed operations and limited FCC resources would be conserved by allowing any concerns or deficiencies to be addressed on an issue-specific basis.

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[54] *See supra* note 43 and related text.

[55] *See* 47 C.F.R. § 25.112(a).

[56] *See* 47 C.F.R. § 25.112(b).

C. 47 C.F.R. § 25.114(c) (Schedule S)

A Schedule S form accompanies this Amendment.[57] SES cannot accurately or fully describe in the Schedule the proposed operations due to the form's limitations and/or the associated administrative burden required to describe the full flexibility of the satellites in the form.[58] SES therefore requests a waiver of the Schedule S rule to the extent necessary to allow some of the required Schedule S information to be supplemented or clarified in the attached Technical Annex instead.

D. 47 C.F.R. §§ 25.116(c), 25.157 (Administrative Processing)

Section 25.116(b) identifies certain kinds of amendments to pending satellite applications that qualify as "major amendments," including amendments that increase the potential for interference, change a system's proposed frequencies, result in a significant environmental effect, or otherwise are found to be substantial by the Commission.[59] Section 25.116(c) states that an NGSO-like application "will be considered to be a newly filed application if it is amended by a major amendment . . . after a 'cut-off' date applicable to the application."[60] But Section 25.116(c) also contains explicit exceptions for amendments that "resolve[] frequency conflicts with authorized stations or other pending applications but do[] not create new or increased frequency conflicts."[61] As demonstrated below, the changes described in this

[57] *See* 47 C.F.R. § 25.114(a)(1).

[58] For example, SES would be required to enter tracking, telemetry, and control ("TT&C") information for *every* possible frequency because it has not yet finalized which frequencies it will use for TT&C for the 72 inclined O3bGEN3 satellites that are subject to the 2020 Modification Application, effectively doubling its workload.

[59] 47 C.F.R. § 25.116(b)(1)-(4).

[60] *Id.* § 25.116(c).

[61] *Id.* § 25.116(c)(1).

Amendment are not "major" under Section 25.116 and should not affect the relative status of the O3bGEN3 system in the 2020 Ku-/Ka-band or 2021 V-band processing round or O3b's existing network in the 2017 Ku-/Ka-band processing round.[62] Even if this Amendment were deemed to be "major," it also resolves frequency conflicts and avoids new ones, thereby eliminating the need to treat this application as "newly filed."[63]

1. This Amendment Is Not a "Major" Amendment Under the Commission's Rules and Precedent.

An amendment is major if it "increases the potential for interference, or changes the proposed frequencies or orbital locations to be used."[64] The purpose of Section 25.116(c) is to "assess the effect of an amendment on applications filed as part of the same processing round."[65] Likewise, an NGSO applicant may amend multiple parameters of a proposed satellite constellation (e.g., orbital altitudes, inclinations, and number of satellites per orbital plane) without converting the filing to a major amendment if the collective changes do not create additional interference risk as to other processing round applicants.[66]

For example, in granting SpaceX's Gen2 amendment authorizing thousands of additional LEO satellites, the Commission treated the amendment as minor notwithstanding its proposed increases in power levels, revised elevation angles, and effective increase in the number of co-

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[62] *Id*. § 25.116(b), (c).

[63] If, however, the Commission determines that (1) this Amendment (or a portion thereof) is a major amendment, (2) no exclusion applies, and (3) no waiver of the rule is warranted, SES requests that the frequency bands subject to this request be included as part of the 2026 Ku-/Ka- and V-band processing rounds.

[64] 47 C.F.R. § 25.116(b)(1).

[65] *O3b Market Access Grant* ¶ 39, n.120.

[66] *Space Exploration Holdings, LLC Request for Orbital Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System*, Order and Authorization, 37 FCC Rcd 14882 ¶ 11 (2022) ("*SpaceX Gen2 Partial Grant*").

channel satellite beams.[67] The Commission has also accepted additional satellites and frequencies[68] and altered orbital parameters[69] as non-major amendments.

As explained more fully in the Technical Annex, the proposed changes will not increase the potential interference to other same-round applicants or licensees. For Ka-band operations, SES has analyzed the proposed O3bGEN3 system against NGSO systems licensed or granted market access in the Commission's second Ka-band processing round, including both user and gateway links. That analysis demonstrates that O3bGEN3 operations will satisfy the Commission's Section 25.261(d) compatibility criteria with significant margin: the maximum weighted-average degraded throughput is 1.05 percent, well below the 3 percent threshold, and the maximum absolute increase in link unavailability is 0.197 percent, well below the 0.4 percent threshold. Further, as shown in Exhibit 1 of the Technical Annex, this maximum weighted-average degraded throughput and maximum absolute increase in link unavailability correspond to one specific system; the results for the rest of the systems analyzed are even lower, showing a maximum weighted-average degraded throughput of 0.473 percent and a maximum absolute increase in link unavailability of 0.017 percent.

For V-band operations, O3bGEN3 likewise will not increase the interference potential to other same-round NGSO systems. Compared with the pending Intelsat V-band application,

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[67] *Id.* ¶ 11; *see also AST&Science LLC Application to Launch and Operate a Non-Geostationary Orbit V-band System*, Order and Authorization, 39 FCC Rcd 8558 (2024) (accepting as "minor" an amendment seeking additional satellites and frequencies) ("*AST&Science Grant*"); *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) (accepting as "minor" an amendment seeking changes to orbital parameters) ("*ViaSat NGSO Grant*").

[68] *AST&Science Grant* ¶ 25.

[69] *ViaSat NGSO Grant* ¶¶ 10-12.

O3bGEN3 reduces the number of V-band satellites from 216 to 72, reduces the number of orbital shells from three to two, slightly lowers the orbital altitude while maintaining the same downlink PFD levels at the Earth's surface, and limits V-band use to gateway operations. These changes reduce constellation density, avoid any increase in downlink PFD levels, and lower the uplink power needed to achieve equivalent link performance.

Accordingly, the Amendment does not create new or increased frequency conflicts and should not be treated as a major amendment under Section 25.116.

2. This Amendment Does Not Create New Frequency Conflicts.

The Commission can refrain from treating a major amendment application as newly filed if it (1) "does not create new or increased frequency conflicts"[70] and (2) either "resolves frequency conflicts with authorized stations or other pending applications"[71] or "is demonstrably necessitated by events which the applicant could not have reasonably foreseen at the time of filing."[72]

For example, in 2021, the Commission granted Boeing's amended V-band application. After the 2018 V-band processing round's closing, Boeing sought to add the 65-71 GHz band, which was outside the scope of the processing round.[73] The Commission concluded that (1) the amendment was "major" but (2) "Boeing's application [did] not need to be treated as a newly-filed application under [its] processing round procedures because the 2018 Amendment resolves

[70] 47 C.F.R. § 25.116(c)(1), (4).

[71] *Id.* § 25.116(c)(1).

[72] *Id.* § 25.116(c)(4).

[73] *See Boeing Application Accepted for Filing in Part, IBFS File No. SAT-LOA-20160622-00058, Cutoff Established for Additional NGSO-Like Satellite Applications or Petitions for Operations in the 37.5-40.0 GHz, 40.0-42.0 GHz, 47.2-50.2 GHz, and 50.4-51.4 GHz Bands*, Public Notice, 31 FCC Rcd 11957 (IB 2016).

frequency conflicts with other authorized stations or pending applications and does not generate new or increased frequency conflicts."[74] Specifically, the Commission determined that the addition of "65-71 GHz band would enable Boeing the flexibility to be able to locate a greater proportion of its gateway earth stations outside of heavily populated areas and away from areas where UMFUS licensees operate."[75] Similarly, the Commission in 2024 determined that AST&Science's V-band amendment application, which requested access to S-band and UHF frequencies, was not major because AST did not make changes to its requested V-band processing round frequencies.[76]

Likewise, this Amendment would not create new or increased frequency conflicts within the 2020 Ku-/Ka-band or 2021 V-band processing rounds. SES seeks to preserve its processing-round status only for the frequencies timely requested in those rounds, while seeking consideration of additional frequencies outside those relevant processing rounds. Authorizing SES to use the additional spectrum will improve network planning and resource allocation and will reduce reliance on the bands for which it has already applied, making coordination and resolving frequency conflicts easier rather than harder.[77] For these reasons, the exception set forth in Section 25.116(c)(1) applies.

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[74] *The Boeing Company Application for Authority to Launch and Operate a Non-Geostationary Satellite Orbit System in the Fixed-Satellite Service*, Order and Authorization, 36 FCC Rcd 16067 ¶ 20 (2021).

[75] *Id.*

[76] *AST&Science Grant* ¶ 25.

[77] If the major amendment rule applies to this Amendment (without an available exception), there is good cause to waive Section 25.116(c) to ensure that this Amendment does not cause SES's timely filed applications to be treated as "newly filed." Strict application of the rule would disserve the public interest by harming SES's ability to deploy a multi-band NGSO system and would not further the purposes for which Section 25.116(c) was adopted.

In addition, many of the changes included in this Amendment are driven by developments not reasonably foreseeable when SES initially filed its 2020 Ka-band processing round application. For example, the Commission has subsequently expanded opportunities to access additional spectrum through rulemakings and waiver precedents that did not exist when SES filed its original application. Moreover, Intelsat was an entirely separate company, had not yet filed the V-band application that now forms part of this Amendment, and there was no reasonable basis to anticipate that SES would later acquire Intelsat and seek to integrate the technical, spectrum, orbital, and market-access assets associated with the two systems into a unified next-generation MEO architecture. The constellation design proposed here reflects the efficiencies created by that transaction and could not have been presented in its current form in 2020. For these reasons, the exception under Section 25.116(c)(4) applies.

E. 47 C.F.R. § 25.146(c) (Favorable or Qualified Favorable Finding)

The Commission's rules require that an NGSO FSS operator licensed to use spectrum within the 10.7-30 GHz frequency band must obtain a favorable or qualified favorable finding regarding its compliance with all applicable equivalent power flux-density ("EPFD") limits from the ITU Radiocommunication Bureau prior to the initiation of service.[78] SES requests a partial waiver of this requirement so it may commence operations prior to receiving an ITU finding. Requiring SES to wait for an ITU finding would deprive its U.S. customers of the benefits of additional capacity and network resiliency that could otherwise be provided upon grant of this Amendment. In addition, a finding could take years, which would further delay SES's ability to deploy the O3bGEN3 system.[79] SES commits to making available to any requesting party the

[78] *See* 47 C.F.R. § 25.146(c).

[79] *See* Space Exploration Holdings, LLC, ICFS File No. SAT-AMD-20210818-00105, Waiver Requests at 4 (filed Aug. 18, 2021) ("Given the volume of pending EPFD filings, the ITU is

data used as input to the ITU-approved validation software until it receives a favorable or qualified favorable finding from the ITU.[80]

F. ITU Filing Requirement (§ 25.137(c)(3))

The Commission's rules require that U.S. market access applicants seeking to serve the U.S. must have submitted the requested frequencies for coordination to the ITU.[81] Since the Commission announced this processing round, SES has evaluated whether to request access to the 17.3-17.7 GHz band, prepared this Amendment application, and begun the requisite ITU filing for 17.3-17.7 GHz. However, SES has not yet submitted the filing due to the time and resources required and the need to ensure all information is accurate. SES therefore requests a waiver of this rule to the extent necessary. SES's position is not unlike that of a new applicant for a U.S.-licensed NGSO system for which a U.S. ITU filing may not yet be submitted at the time the application is filed. SES will notify the Commission once the filing has been submitted.

V. PUBLIC INTEREST (47 C.F.R. § 25.114(D)(6))

Grant of this Amendment will serve the public interest by enabling SES to expand and modernize its existing O3b MEO network to meet growing demand from U.S. customers for high-throughput, low-latency satellite connectivity. The O3bGEN3 system builds on O3b's proven record of providing reliable Ka-band NGSO services and will add capacity, resiliency, and operational flexibility through additional MEO satellites, expanded Ka- and V-band capabilities, and optical inter-satellite links. These enhancements will allow SES to support a broader range of broadband, mobility, enterprise, government, and emergency-response

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unlikely to complete its evaluation of the Gen2 System and render an EPFD finding on a timeframe that will match SpaceX's aggressive constellation deployment schedule.").

[80] *See SpaceX 2026 Grant* at Condition 4(e); *SpaceX Gen2 Partial Grant* ¶ 40.

[81] 47 C.F.R. § 25.137(c)(3).

applications, including in areas and for use cases where terrestrial networks are unavailable, limited, or insufficient. Accordingly, grant of the Amendment will promote competition, efficient spectrum use, and expanded access to advanced satellite services, and therefore will serve the public interest.

SES has installed and operates essential components of its ground infrastructure in the United States, representing multimillion-dollar investments that support the provision of reliable satellite connectivity to U.S. customers. SES's MEO network provides high-capacity, low-latency connectivity that enables real-time applications in areas where fiber access is limited, unavailable, or impractical. These capabilities have generated demand from civilian and defense components of the U.S. government, as well as from enterprise, maritime, transportable, and energy customers that require reliable connectivity in remote or mobile environments, including in emergency response scenarios. Increasingly, SES's MEO capacity is also being used to support aeronautical mobility applications. By expanding capacity and operational flexibility, the O3bGEN3 system will allow SES to better support these existing and emerging use cases as data and mobility demands continue to grow.

In sum, grant of this Amendment will allow SES to expand the capacity, resiliency, and flexibility of its existing MEO network while continuing to meet the Commission's technical and operational requirements. The proposed O3bGEN3 system will enhance service quality, support new and existing broadband, mobility, enterprise, government, and disaster-recovery applications, and promote more efficient use of spectrum without increasing the risk of harmful interference. For these reasons, grant of the Amendment will serve the public interest.

VI. CONCLUSION

For the reasons set forth above, SES respectfully requests that the Commission grant this Amendment.

Respectfully submitted,

/s/ Daniel C.H. Mah

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July 6, 2026

EXHIBIT A – OWNERSHIP INFORMATION

This attachment includes the ownership information sought in the Form 312, Main Form.

Ownership Information

The applicant, ASTRA (GB) Limited ("ASTRA GB"), a U.K. corporation, is an indirect wholly-owned subsidiary of SES S.A. ("SES"), a Luxembourg company. SES ASTRA S.A., a Luxembourg corporation, holds 100% of the capital stock of ASTRA GB. In turn, SES S.A. holds 100% of the capital stock of SES ASTRA S.A.

Through its subsidiaries and affiliates, SES engages in the provision of satellite services in North and South America, Europe, Africa, and Asia. The individual legal entities that are direct and indirect subsidiaries of SES remain distinct.

The offices of SES and SES ASTRA S.A. are at L-6815 Château de Betzdorf, Luxembourg. The offices of ASTRA (GB) Limited are at 3rd Floor, 86-90 Paul Street, London EC2A 4NE, United Kingdom.

The names, addresses, and citizenship of stockholders owning of record and/or voting 10 percent or more of SES shares, to the best of ASTRA GB's knowledge, are indicated below. For purposes of this form, unless otherwise indicated, shareholder percentages are calculated using information available to SES as of June 30, 2026.

1. The **Etat du Grand Duché de Luxembourg** (the "State of Luxembourg"), the **Banque et Caisse d'Epargne de l'Etat** ("BCEE"), and **Société Nationale de Crédit et d'Investissement** ("SNCI")—each of which is a financial institution 100% owned by the State of Luxembourg—hold Class B shares of SES. Each of the Class B shareholders holds the following economic interest and voting interest percentages, respectively: BCEE holds 5.44% and 10.879%; SNCI holds 5.44% and 10.877%, and the State of Luxembourg holds 5.79% and 11.577%. In addition, SES understands that the State of Luxembourg, BCEE, and SNCI hold a limited number of publicly traded Fiduciary Deposit Receipts ("FDRs"). Based on publicly available information available to SES as of March 31, 2026, the State of Luxembourg, BCEE, and SNCI held FDRs representing an ownership interest of 1.17%, 0.91%, and 1.36%, respectively. The FDR holdings of these entities may have changed and may change at any time, as they are entitled to buy and sell FDRs without notice to SES. The principal business of both BCEE and SNCI is financial services.
The address for the State of Luxembourg is Ministry of State, Department of Media, Connectivity, and Digital Policy, 5, rue Plaetis, L-2338 Luxembourg.

The addresses of BCEE and SNCI are as follows:

Banque et Caisse d'Epargne de
l'Etat 1, place de Metz
L-1930 Luxembourg

Société Nationale de Crédit et
d'Investissement 7, rue du Saint-Esprit
L-1475 Luxembourg

2. **Atlas Infrastructure Partners (UK) Ltd** ("Atlas") holds an 11.95% economic interest and a 9.56% voting interest. Atlas, a U.K. company, is an investment fund and has the below address:

Atlas Infrastructure Partners (UK) Ltd
3rd Floor, 25 Watling St.
London EC4M 9BR, United Kingdom

3. **The Lazard Entities: Lazard Asset Management, LLC** ("LAM LLC"), a U.S. investment advisor and hedge fund and **Lazard Asset Management Pacific Company**, an Australian investment advisor and wholly owned subsidiary of LAM LLC hold a combined 12.06% economic interest and a 9.65% voting interest in SES.

The addresses of the Lazard Entities are as follows:

Lazard Asset Management, LLC
30 Rockefeller Plaza
New York, NY 10112

Lazard Asset Management Pacific Company
Level 12 Gateway
1 Macquarie Place
Sydney, NSW, 2000

Directors and Officers

The directors and officers of ASTRA (GB) Limited are:

Peter Hall, Director
Stewart Sanders, Director
Yvonne Bos, Company Secretary

The address of Messrs. Hall and Sanders is Building 5, Chiswick Park, 566 Chiswick High Road, London W4 5YS, United Kingdom. The address of Ms. Bos is Rooseveltplantsoen 4, The Hague 2517 KR, Netherlands. Messrs. Hall and Sanders are citizens of the United Kingdom. Ms. Bos is a citizen of the Netherlands.

EXHIBIT B – ALIEN OWNERSHIP (RESPONSE TO ITEM 34)

Section 310(b)(4) of the Communications Act of 1934, as amended, establishes certain limitations on indirect foreign ownership and voting of certain common carrier and broadcast licensees. By definition, these limitations do not apply to the non-broadcast, non-common carrier operations of ASTRA (GB) Limited proposed in this application.

EXHIBIT C – TECHNICAL ANNEX

Technical Annex

1. Scope

SES seeks changes to the U.S. market access authority for its authorized O3b non-geostationary orbit ("NGSO") satellite system ("O3bGEN1")[1] to allow additional satellites ("O3bGEN3") to serve the United States in the Ka- and V-bands. This annex contains the information required by Section 25.114(d) and other sections of the Commission's Part 25 rules that cannot be captured by the Schedule S software.

SES proposes to add 72 inclined MEO satellites and two equatorial MEO satellites (for a total of 74 additional satellites) to the 32 licensed MEO equatorial satellites. All equatorial satellites will operate user terminals and gateway links in the Ka-band. The proposed 72 inclined satellites will operate user terminals and gateway links in the Ka-band and gateway links in the V-band. The requested frequencies are summarized in Table 1.

Table 1: Requested Frequency Bands

Direction	O3b Licensed Satellites 1-16	O3b Licensed Satellites 17-20	O3b Licensed Satellites 21-32	Proposed 0° Inclined (Equatorial) Satellites 33-34	Proposed 55° & 49° Inclined Satellites 35-106
space-to-Earth	17.8-18.6 GHz 18.8-19.3 GHz	17.8-18.6 GHz 18.8-19.3 GHz 19.7-20.2 GHz	17.7-20.2 GHz[2]	17.7-20.2 GHz	17.3-20.2 GHz
Earth-to-space	27.6-28.4 GHz 28.6-29.1 GHz	27.6-28.4 GHz 28.6-29.1 GHz 29.5-30.0 GHz	27.5-30.0 GHz	27.5-30.0 GHz	27.5-30.0 GHz
space-to-Earth					37.5-42.0 GHz
Earth-to-space					47.2-50.2 GHz 50.4-51.4 GHz

2. ITU Filing (§ 25.111)

The additional 74 satellites of O3bGEN3 will operate under International Telecommunication Union ("ITU") satellite network filings submitted by the Luxembourg administration (including LUX-N1-2, O3BNEXT3, and O3BNEXT3-A).[3]

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[1] *See 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) ("*O3b Market Access Grant*").

[2] SES seeks to add 17.7-17.8 GHz and 18.6-18.8 GHz to these satellites as part of this Amendment.

[3] SES intends to submit additional ITU filings for this system in the future. *See* Legal Narrative at Section IV.F.

3. General Description of Overall System Facilities, Operations and Services (§ 25.114(d)(1))

3.1. Orbital Parameters

Schedule S captures the entire constellation, where Orbital Plane No. 1 covers the authorized O3bGEN1 satellites (numbers 1 to 32), Orbital Plane No. 2 covers the proposed additional equatorial O3bGEN3 satellites (33-34), and Orbital Plane Nos. 3 to 11 cover the proposed inclined O3bGEN3 satellites (35-106).

The orbital parameters are provided in Table 2. The satellites in Shell 1A are satellites already licensed; the satellites in Shells 1B, 2, and 3 are satellites in pending status from the 2020 Ka-band processing round and 2021 V-band processing round, as revised by this Amendment.[4]

Table 2: Orbital Parameters

Altitude	8,062 km			
Shell	1A	1B	2	3
Inclination Angle	0°	0°	55°	49°
Number of Planes	1	1	6	3
Number of Satellites/Plane	32	2	8	8
Number of Satellites/Shell	32	2	48	24
Total Number of Satellites	106			

The Schedule S software produces an error when entering 0.0 degree for satellite inclination, so SES entered a 0.001 degree inclination angle for satellites 1 to 34.

3.2. Channel and Frequency Plan for Additional Satellites

Table 3 depicts the proposed frequency plan for the O3bGEN3 satellites.

[4] *See* Legal Narrative at Section II.

Table 3: O3bGEN3 Frequency Plan

User Terminals	17.3-18.8 GHz (space-to-Earth)	FSS
	18.8-19.7 GHz (space-to-Earth)	FSS
	19.7-20.2 GHz (space-to-Earth)	FSS, MSS
	27.5-29.5 GHz (Earth-to-space)	FSS
	29.5-30.0 GHz (Earth-to-space)	FSS, MSS
Gateways	17.3-18.8 GHz (space-to-Earth)	FSS
	18.8-20.2 GHz (space-to-Earth)	FSS
	27.5-30.0 GHz (Earth-to-space)	FSS
	37.5-42.0 GHz (space-to-Earth)	FSS
	47.2-50.2 GHz (Earth-to-space)	FSS
	50.4-51.4 GHz (Earth-to-space)	FSS

The O3bGEN3 satellites will employ an advanced digital channelizer that can dynamically route uplink to the downlink spectrum. The transmit and receive antennas allow beam forming and beam shaping that provide steerable and shapeable gain patterns. Each antenna beam will be pointed to a specified position as the satellite traverses its active arc. At the beginning and end of the active arc that serves each ground position, the satellite antennas will be repointed to provide the necessary connectivity for the next active arc. Handover of traffic between satellites will be seamless, as there will always be more than one satellite visible to each earth station at the times that satellite handover is required. Payload operations and traffic management will be handled globally by a software-driven dynamic resource manager.

Frequency re-use (per satellite) is achieved by a combination of dual polarization (RHCP and LHCP), beam forming, and spatial isolation between co-frequency, co-polarized antennas.[5]

All O3bGEN3 satellites will be capable of operating in the requested Ka-band frequencies for user terminals and gateways. The inclined O3bGEN3 satellites will also operate in the V-band for gateways. These inclined satellites will employ a digital channelizer that allows transmission bandwidths to vary to meet user requirements. The O3bGEN3 satellites in inclined orbits will also operate optical inter-satellite links for communications among the satellites and for the provision of space data relay services to third parties.

The following sections address the use of each frequency band requested in the application and refer to the allocation and footnotes contained in the U.S. Table of Frequency Allocations.

[5] *See* 47 C.F.R. § 25.210(f).

3.3. Ka-band

For both the downlink and uplink use of the requested Ka-band frequencies, SES certifies that it will comply with the applicable requirements set forth in Section 25.146 of the Commission's rules.[6]

3.3.1. Downlink

The 17.3-17.7 GHz band is allocated to the FSS (Earth-to-space), FSS (space-to-Earth) and BSS on a primary basis, and federal radiolocation on a secondary basis. Footnote US402 provides that existing Federal FSS (Earth-to-space) and associated earth stations may operate on a primary basis in certain frequency ranges and in specific areas.[7] SES will not claim protection from federal operations subject to Footnote US402.

The 17.7-17.8 GHz band is allocated to the Fixed Service ("FS"), FSS (Earth-to-space) and FSS (space-to-Earth) on a primary basis. SES will not claim protection from FS transmissions in this band.[8] SES requests access to this band not only for its O3bGEN3 satellites but also for satellites 21-32 of the existing O3b system.[9]

The 17.8-18.3 GHz band is allocated to the FS and the FSS (space-to-Earth) for federal and non-federal use on a primary basis.[10] The band 18.0-18.3 GHz is also allocated to the meteorological-satellite service (space-to-Earth) on a primary basis.[11] Under the Commission's Ka-Band Plan, FS is primary in the 17.8-18.3 GHz frequency band and non-federal FSS is secondary.[12] In the 17.8-18.3 GHz band, terrestrial services are protected from satellite emissions by power flux density ("PFD") limits on the Earth's surface.[13] The O3bGEN3 satellites will comply with these PFD limits.

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[6] 47 C.F.R. § 25.146. SES recognizes that these rules are pending updates and certifies that it will comply with the revised version of 47 C.F.R. § 25.146 as well. *See generally Modernizing Spectrum Sharing for Satellite Broadband*, SB Docket No. 25-157, Report and Order, FCC 26-26 (rel. May 1, 2026).

[7] 47 C.F.R. § 2.106(c), n.US402.

[8] 47 C.F.R. § 2.106(c), n.NG58(iv).

[9] As noted in Section II of the accompanying Legal Narrative, SES had requested access to this band as part of the 2017 Ku-/Ka-band processing round. The Commission deferred acting on that request at the time, and SES now asks the Commission reevaluate this request.

[10] In the 17.8-18.142 GHz band, the commercial FSS allocation is on a secondary basis.

[11] 47 C.F.R. § 2.106(c), n.US519.

[12] *See 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) ("Ka-Band Plan").

[13] 47 C.F.R. § 25.146(a)(1).

The 18.3-18.6 GHz band is allocated to the FSS (space-to-Earth) for federal and non-federal use on a primary basis. The Commission's Ka-Band Plan designates the 18.3-18.6 GHz frequency band to GSO FSS on a primary basis and NGSO FSS on a secondary basis. SES will not claim protection from the primary GSO FSS networks.

The 18.6-18.8 GHz band is allocated to the Earth Exploration Satellite (passive) service ("EESS"), FSS (space-to-Earth), and Space Research service (passive) for federal and non-federal use on a primary basis. The Commission's Ka-Band Plan designates the band for GSO FSS only. As discussed in the Legal Narrative, SES seeks a waiver to conduct NGSO FSS in this band on a non-interference and non-protected basis to authorized services in the band. SES requests access to this band not only for its O3bGEN3 satellites but also for satellites 21-32 of the existing O3b system.[14]

The 18.8-19.3 GHz band is allocated to the FSS (space-to-Earth) for federal and non-federal use on a primary basis. The Commission's Ka-Band Plan designates the 18.8-19.3 GHz frequency band to NGSO FSS on a primary basis and GSO FSS on a secondary basis. SES commits to coordinate in good faith with other NGSO systems. Prior to commencing operations, SES will either certify that it has completed a coordination agreement with any operational NGSO FSS system licensed or granted U.S. market access in an earlier processing round or submit a compatibility showing demonstrating that it will not cause harmful interference to any such system with which coordination was not completed.[15]

The 19.3-19.7 GHz band is allocated to the FSS (space-to-Earth) on a primary basis for federal and non-federal use and to the FS for non-federal use. In the 19.3-19.4 GHz and 19.6-19.7 GHz segments of this band, the Commission's Ka-band Plan designates NGSO FSS as secondary to GSO FSS and to FS. O3bGEN3 will protect the FS through compliance with applicable PFD limits on the Earth's surface.[16] The Commission's Ka-Band Plan designates the 19.4-19.6 GHz segment of the band for primary use by NGSO satellite systems for MSS feeder-links ("FLs") and the FS.[17] SES proposes to use the 19.4-19.6 GHz as a feeder link to support MSS services (*e.g.*, when connecting to a user terminal in the 29.5-30.0 GHz band, which has an MSS allocation) and is requesting a waiver of the Ka-band Plan to allow it to conduct both MSS and

[14] See Section II of the accompanying Legal Narrative for details regarding this request and Section IV.A.1 of the Legal Narrative regarding the associated waiver request.

[15] *See* 47 C.F.R. § 25.261(d).

[16] 47 C.F.R. § 25.146(a).

[17] NGSO FSS may operate secondary to FS in 19.3-19.4 GHz and 19.6-19.7 GHz.

FSS operations on a non-interference, non-protected basis.[18] SES commits to coordinate with existing NGSO MSS systems, including Iridium.[19]

The 19.7-20.2 GHz band is allocated to the FSS for federal and non-federal use and to the MSS for non-federal use on a primary basis. The Commission's Ka-Band Plan designates the 19.7-20.2 GHz frequency band for GSO FSS on a primary basis and NGSO FSS on a secondary basis. SES will not claim protection from the primary GSO FSS networks.

The U.S. and ITU Table of Frequency Allocations in Region 2 has a primary MSS allocation in the 19.7-20.2 GHz band, but the Ka-Band Plan omits MSS. The Legal Narrative includes a waiver request to conduct MSS operations in the band. SES's proposed MSS operations are similar to FSS operations in this band, and therefore SES can protect primary GSO satellite networks under the relevant FCC requirements.[20] SES's MSS operations will not claim protection from systems using these bands for FSS operations.[21]

3.3.2. Uplink

The 27.5-28.35 GHz band is allocated to the FS, Mobile Service ("MS"), and FSS (Earth-to-space) on a primary basis. Under the Commission's Ka-Band Plan, Upper Microwave Flexible Use Service ("UMFUS") is primary, and FSS is secondary. Accordingly, SES will operate on a secondary basis with respect to UMFUS operations, except for earth stations authorized under Section 25.136 of the Commission's rules. SES will make the necessary technical showing when seeking U.S. earth station authorizations in this frequency band.

The 28.35-28.6 GHz band is allocated to the FSS (Earth-to-space) on a primary basis. The Commission's Ka-Band Plan designates the 28.35-28.6 GHz frequency band to GSO FSS on a primary basis and NGSO FSS on a secondary basis. SES will not claim protection from the primary GSO FSS networks.

The 28.6-29.1 GHz band is allocated to the FSS (Earth-to-space) on a primary basis. The Commission's Ka-Band Plan designates the 28.6-29.1 GHz frequency band to NGSO FSS on a

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[18] *See* Legal Narrative at Section IV.A.2; *see also Space Exploration Holdings, LLC Request for Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System*, ICFS File Nos. SAT-LOA-20200526-00055 et al., Authorization and Order, DA 26-36, Condition 3(d)-(e) (SB rel. Jan. 9, 2026) ("*SpaceX Gen2 Upgrade Order*").

[19] *See O3b Market Access Grant* ¶ 46(c) ("Operations in the 19.4-19.6 GHz and 29.1-29.3 GHz frequency bands must be coordinated with any previously authorized NGSO MSS systems not included in this Ku-Ka-band processing round."); *see also* 47 C.F.R. §§ 25.203, 25.250. SES also commits to complying with applicable PFD limits. *See id.* § 25.146(a)(1).

[20] *See O3b Market Access Grant* ¶ 21; *SpaceX Gen2 Upgrade Order* ¶ 12.

[21] *See O3b Market Access Grant* ¶ 46(d) ("MSS operations in the 19.7-20.2 GHz and 29.5-30 GHz frequency bands shall be conducted on a non-interference, non-protected basis with respect to other FSS operations in these bands."); *SpaceX Gen2 Upgrade Order* ¶ 12.

primary basis and GSO FSS on a secondary basis. Per Section 25.261 of the Commission's rules, SES commits to coordinate in good faith with other NGSO systems to avoid harmful interference. Prior to commencing operations, SES will either certify that it has completed a coordination agreement with any operational NGSO FSS system licensed or granted U.S. market access in an earlier processing round, or submit a compatibility showing that demonstrates, using the Commission's degraded throughput methodology, that it will not cause harmful interference to any system with which coordination has not been completed.[22]

The 29.1-29.25 GHz band is allocated to the FS, FSS (Earth-to-space) and MS on a primary basis. The Commission's Ka-Band Plan designates the 29.1-29.25 GHz frequency bands to Local Multipoint Distribution Service ("LMDS") and NGSO MSS FL uplinks on a primary basis.[23] SES proposes to use the 29.1-29.25 GHz as a feeder link to support MSS services (*e.g.*, when connecting to a user terminal in the 19.7-20.2 GHz band, which has an MSS allocation) and is requesting a waiver of the Ka-band Plan to allow it to use the band to support both MSS and FSS operations on a non-interference, non-protected basis.[24] SES recognizes that coordination is necessary in the portions of these bands used by existing NGSO MSS systems. SES will demonstrate that it will not cause unacceptable interference to the Iridium system or certify that it will conform to coordination agreements with Iridium.[25]

The 29.25-29.5 GHz band is allocated to the FSS (Earth-to-space) on a primary basis. The Commission's Ka-Band Plan designates the 29.25-29.5 GHz frequency band to GSO FSS and NGSO MSS FL on a primary basis. SES proposes to use the 29.25-29.5 GHz as a feeder link to support MSS services (*e.g.*, when connecting to a user terminal in the 19.7-20.2 GHz band, which has an MSS allocation) and is requesting a waiver of the Ka-band Plan to allow it to use the band to support both MSS and FSS operations on a non-interference, non-protected basis.[26] Similar to the 29.1-29.25 GHz band, SES understands that it must demonstrate that it will not cause unacceptable interference to the Iridium system or certify that it will conform to coordination agreements with Iridium.[27]

The 29.5-30.0 GHz band is allocated to the FSS (Earth-to-space) and MSS on a primary basis. The Commission's Ka-Band Plan designates the 29.5-30 GHz frequency band to GSO FSS on a primary basis and NGSO FSS on a secondary basis. SES will protect the primary GSO satellite

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[22] 47 C.F.R. § 25.261(d).

[23] SES will coordinate with LMDS operators as necessary. *See* 47 C.F.R. §§ 25.257, 101.147(y).

[24] *See* Legal Narrative at Section IV.A.4.

[25] *See O3b Market Access Grant* ¶ 46(c); 47 C.F.R. §§ 25.203(k), 25.250.

[26] *See* Legal Narrative at Section IV.A.4.

[27] *See O3b Market Access Grant* ¶ 46(c); *see also* 47 C.F.R. §§ 25.203, 25.250. SES also commits to complying with applicable PFD limits. *See id.* § 25.146(a)(1).

networks under the relevant FCC requirements and will not claim protection from the primary GSO FSS networks.[28]

The U.S. and ITU Table of Frequency Allocations in Region 2 has a primary MSS allocation in the 29.5-30.0 GHz band, but the Ka-Band Plan omits MSS. The Legal Narrative includes a waiver request to conduct MSS operations in the band.[29] SES's proposed MSS operations are similar to FSS operations in this band and therefore SES will protect the primary GSO satellite networks using applicable EPFD limits.[30] SES's MSS operations will not claim protection from systems using these bands for FSS operations.[31]

3.4. V-band

SES commits to compliance with the ITU single entry and aggregate criteria for NGSO systems to protect GSO networks.[32]

3.4.1. Downlink

The 37.5-40.0 GHz band is allocated to the FS, FSS (space-to-Earth), and MS on a primary basis. SES will operate on a non-protected and non-interference basis with respect to UMFUS operations in the band, except for earth stations authorized under Section 25.136 of the Commission's rules. SES will make the necessary technical showing when seeking U.S. earth station authorizations in this frequency band.

This band is also allocated to federal users including FS, MS, Space Research (space-to-Earth), FSS, and MSS (space-to-Earth) services. SES will coordinate with the National Telecommunications and Information Administration ("NTIA") and federal agencies as needed to ensure that O3bGEN3 will operate in a manner that is compatible with these federal services.

The 40.0-42.0 GHz band is allocated to Broadcasting, Broadcasting-Satellite, FS, FSS (space-to-Earth), MS, and MSS (space-to-Earth) in various segments on a primary basis. The band is also allocated to federal users including EESS (Earth-to-space), FSS (space-to-Earth), MSS (space-to-Earth), and Space Research (Earth-to-space) service in various segments. SES will coordinate

[28] *See* 47 C.F.R. § 25.146.

[29] *See* Legal Narrative at Section IV.A.3.

[30] *See O3b Market Access Grant* ¶ 21; *SpaceX Gen2 Upgrade Order* ¶ 12.

[31] *See O3b Market Access Grant* ¶ 46(d) ("MSS operations in the 19.7-20.2 GHz and 29.5-30 GHz frequency bands shall be conducted on a non-interference, non-protected basis with respect to other FSS operations in these bands."); *SpaceX Gen2 Upgrade Order* ¶ 12.

[32] ITU Radio Regulations, Art. 22, Nos. 22.5L, 22.5M.

with NTIA and federal agencies as needed to ensure the O3bGEN3 satellites will operate in a manner that is compatible with these Federal services.[33]

3.4.2. Uplink

The 47.2-48.2 GHz band is allocated to the FS, FSS (Earth-to-space), and MS services on a primary basis. In this band FSS earth stations are subject to Section 25.136 and SES will address the relevant conditions of that rule in future earth station applications.

The 48.2-50.2 GHz band is allocated to the FS, FSS (Earth-to-space), and MS services on a primary basis. Footnote US156 sets unwanted emission levels for FSS earth stations operating in the 49.7-50.2 GHz band, and Footnote US342 stipulates the need to protect radio astronomy observations in the 48.94-49.04 GHz band from transmitting FSS earth stations. SES will address these requirements in future earth station applications. SES will also coordinate with the NTIA and federal agencies to avoid interference to any of these and other federal government users operating consistent with the U.S. Table of Frequency Allocations.[34]

The 50.4-51.4 GHz band is allocated to the FS, FSS (Earth-to-space), MS, and MSS (Earth-to-space) services on a primary basis. SES will address Section 25.136's requirements in future earth station applications as well as Footnote US516's unwanted emission levels in the 50.4-50.9 GHz band. SES will coordinate with NTIA and federal agencies to avoid interference to any federal government uses operating in accordance with the U.S. Table of Frequency Allocations.[35]

4. Telemetry, Tracking, and Command (§ 25.202(g))

The O3bGEN3 system will operate its tracking, telemetry, and control ("TT&C") signals in frequencies within the uplink and downlink Ka-band spectrum. If the signals are not at the band edge, they will not cause greater interference or require more protection from harmful interference than the communications traffic on the satellite network.[36]

O3bGEN3 is capable of configuring telecommand signals across the 27.5–30.0 GHz uplink band and telemetry signals across the 17.7–20.2 GHz downlink band. The TT&C carriers are configurable within these bands and typically have a bandwidth of approximately 1 MHz.

In the Schedule S, Beams CMD, CMD1, CMD2, CMD3, CMD4, TLM1, TLM2, TLM3, TLM4, TLMN, and TLMS are carried forward from prior applications and reflect the TT&C capabilities of the equatorial satellites in orbital planes 1 and 2. The beams identified as CMD5, CMD6,

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[33] *See, e.g., SpaceX Gen2 Upgrade Order* at Condition 9.

[34] *See, e.g., id.* at Condition 10.

[35] *See id.*

[36] 47 C.F.R. § 25.202(g).

TLM5, and TLM6 are representative TT&C beams for the inclined-orbit satellites in orbital planes 3 through 11. SES has not finalized which frequencies it will use for TT&C for these satellites. Due to limitations in Schedule S, SES must either submit a few representative TT&C beams (as it has done) or account for *every* possible channel, vastly increasing its administrative burden.[37] To the extent necessary, SES has requested a waiver of the Schedule S requirements to describe the TT&C frequencies in this way.[38]

5. Cessation of Emissions (§ 25.207)

Each satellite transmission chain can be individually turned on and off by ground telecommand, thereby causing cessation of emissions from the satellite, as required by Section 25.207 of the Commission's rules.

6. Compliance with PFD Limits (§ 25.146(a)(1))

SES certifies that it will comply with all applicable Commission and ITU PFD limits as required by Section 25.146(a)(1) and indicated in Schedule S. In Section 5 of the Schedule S (Space to Earth Transmit Beams), SES used a reference bandwidth of 1 MHz for item (j) (maximum transmit EIRP density (dBW/Ref BW)).

7. Frequency Tolerance (§ 25.202(e))

The O3bGEN3 constellation satellites will maintain the carrier frequency within 0.002% of the reference frequency as required in Section 25.202(e).

8. Emission limits (§ 25.202(f))

The emissions of the O3bGEN3 satellites will comply with Section 25.202(f) and Resolution 750.[39]

9. Coordination with U.S. Government Satellite Networks

Footnote US334 requires coordination of non-Federal 17.8-20.2 GHz satellite downlinks with U.S. Government satellite networks, both GSO and NGSO, and the associated earth stations filed under 9.7A and 9.7B of the ITU Radio Regulations through other administrations. SES has

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[37] The Commission has proposed to replace Schedule S with newer, more flexible schedules in part to reduce the administrative burden for applicants. *See Space Modernization for the 21st Century*, Draft Report and Order and Further Notice of Proposed Rulemaking, FCC-CIRC2607-02 ¶ 63 (rel. July 1, 2026).

[38] *See* Legal Narrative at Section IV.C.

[39] *See* Resolution 750 (Rev.WRC-19) (2019) (setting unwanted emissions limits for FSS operations in the 49.7-50.2 GHz and 50.4-50.9 GHz bands to protect Earth-exploration satellite service (passive) sensing in 50.2-50.4 GHz).

already completed federal coordination for the already-licensed and in-orbit O3bGEN1 satellites. For O3bGEN3, SES will pursue a revision of the existing agreement before commencing operations.

10. Protection of Radio Astronomy

SES will protect radio astronomy services from SES's operations as required, such as taking all practicable steps to protect radio astronomy observations in the adjacent bands from harmful interference from its operations in the 40.5-42 GHz band (space-to-Earth) and taking all practicable steps to protect radio astronomy observations from harmful interference from its operations in the 48.94-49.04 GHz band (Earth-to-space).[40] SES also commits to coordinate with radio astronomy stations in 48.94-49.04 GHz.[41]

11. Predicted Space Station Antenna Gain Contours (§ 25.114(c)(4)(vi))

Antenna gain contours representative of both customer and gateway beams are attached to the Schedule S in PDF format. As these antenna beams are steerable and shapeable, SES has provided representative antenna gain contours for the transmit and receive antennas for both a beam pointed at nadir and at minimum operating elevation of 10° for gateway terminals and 30° for user terminals. The coverage patterns of the command and telemetry beams have gain contours that vary by less than 8 dB across the surface of the Earth and, accordingly, the gain at 8 dB below the peak falls beyond the edge of the Earth. Therefore, pursuant to Section 25.114(c)(4)(vi)(A), contours for TT&C beams are not required to be provided and have not been included in Schedule S.

12. Sharing Among NGSO FSS Space Stations (§ 25.261)

SES is fully committed to coordinating in good faith with all licensed or market access operators regardless of their processing round status. SES has analyzed the impact of its proposal to add 72 inclined Ka and V-band satellites and 2 Ka-band equatorial satellites to its MEO constellation with respect to NGSO systems licensed in the Commission's second Ka- and V-band processing rounds.[42]

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[40] *See* 47 C.F.R. § 2.106(c), n.US211 and US342. *See also Space Exploration Holdings, LLC Request for Deployment and Operating Authority for the SpaceX Gen2 NGSO Satellite System*, ICFS File Nos. SAT-LOA-20200526-00055 et al., Order and Authorization, DA 24-1193 ¶ 89(cc), (ff) (SB 2024).

[41] *See O3b Market Access Grant* ¶ 47(i).

[42] SES applied the same methodology proposed by SpaceX and adopted by the Commission. *See* Letter from Jayson L. Cohen, Director, Satellite Policy, Space Exploration Technologies Corp., to Marlene H. Dortch, Secretary, FCC, IB Docket 21-456, Attachment (filed July 25, 2024); *Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems*, Second Report and Order and Order on Reconsideration, 39 FCC Rcd 12656 ¶¶ 1, 15, 30 (2024).

12.1. Ka-band

A detailed description of the analysis, including the methodology, assumptions and system specification, and the results appears in Exhibit 1. SES analyzed its proposed O3bGEN3 satellites against the Telesat LightSpeed, Amazon Kuiper, SpaceX Starlink Gen 2, OneWeb, and Mangata constellations' user and gateway links. The results of the analysis demonstrate that SES's operations will meet the criteria in Section 25.261(d) with significant margin.

As shown in Exhibit 1 the maximum averaged degraded throughput was 1.05%, well below the 3% allowed in the Commission's rules. The maximum absolute change in the link availability was 0.197%, also lower than the 0.4% allowed in the Commission's rules. Further, these maximum values correspond to the Mangata system; the results for the other systems analyzed are significantly lower, showing a maximum weighted-average degraded throughput of 0.473% and a maximum absolute increase in link unavailability of 0.017%.

12.2. V-band

SES's proposed V-band operations will operate within the parameters of Intelsat's second V-band processing round application[43] and will not increase the potential for interference to other same-round applicants.

As shown in Table 4 below, SES proposes to reduce the number of satellites compared to the Intelsat pending application (216 satellites to 72 satellites) and reduce the number of orbital shells from three to two. The inclination of the satellites will be adjusted from 62.9° to 55° and from 47° to 49°. The O3bGEN3 satellites will only conduct gateway operations using V-band frequencies, unlike the Intelsat application that proposed to use V-band for user and gateway operations. These changes reduce the overall constellation density and therefore do not increase the aggregate interference environment.

SES will reduce the orbital altitude from 8,600 km (for Intelsat's proposed V-band constellation) to 8,062 km but maintain the same operating power flux-density levels at the Earth's surface. Accordingly, the proposed altitude reduction will not increase the potential for downlink interference to other NGSO systems.

For the uplink, the lower orbital altitude also reduces the path loss between Earth stations and satellites. As a result, Earth stations will require less transmit power to achieve the same link performance, which will result in not increasing the uplink interference to other NGSO users.

Due to the reduced number of satellites, fewer shells, lower uplink power, and maintained downlink PFD levels, SES's proposed V-band operations will not increase the interference potential to other same-round NGSO systems.

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[43] *See* Application of Intelsat License, LLC, ICFS File No. SAT-PDR-20211104-00146 (filed Nov. 4, 2021).

Table 4: SES Proposed V-Band Operations vs Intelsat's 2021 Application

	Intelsat 2021 V-band Application			O3bGEN3	
Orbit Planes	6	6	6	6	3
Satellites per Plane	12	12	12	8	8
Inclination (deg)	89	62.9	47	55	49
Altitude (km)	8600	8600	8600	8062	8062
Total Number of Satellites	216			72	

13. Orbital Debris (§ 25.114(d)(14))

SES provides the following information describing the measures it will implement to mitigate orbital debris and support the long-term safety and sustainability of the space environment. SES will submit an orbital debris mitigation plan once it has finalized the O3bGEN3 satellite design.[44]

SES understands the importance of space sustainability and being proactive in ensuring the safe operation and disposal of all spacecraft under its control. SES will work with the manufacturer of its satellites to prioritize orbital debris mitigation in system design and operations. SES will implement the latest technology to reduce the likelihood of collision, casualty, and explosion at any mission stage. Testing will include a reliability analysis for the TT&C, propulsion, and energy systems, among other features, supporting orbital debris mitigation and successful disposal.

13.1. Spacecraft Hardware Design

The O3bGEN3 constellation will be designed to avoid the creation of debris during deployment and normal operation. The satellite design will protect against micrometeoroid flux and impact probability consistent with NASA guidelines and standards.

SES will assess and limit the amount of debris released in a planned manner during normal operations.[45] The satellite design, manufacturer, and launch provider have not been finalized

[44] The Commission has previously approved satellite applications on the condition that the operator later submit an orbital debris mitigation plan for approval prior to commencing operations. *See, e.g., Space Exploration Holdings, LLC Request for Modification of the Authorization for the SpaceX NGSO Satellite System*, Order and Authorization, 34 FCC Rcd 2526 ¶ 32 (IB 2019); *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 ¶ 64 (2020). SES requests approval under similar conditions for this Amendment.

[45] 47 C.F.R. § 25.114(d)(14)(i).

but, based on the design approach used for recent SES satellite missions, SES expects that no mission-related debris will be generated during launch, spacecraft separation, or routine on-orbit operations.

SES will also assess and limit the probability of a satellite in the O3bGEN3 constellation becoming a source of debris by collisions with small debris or meteoroids that could cause loss of control and prevent post-mission disposal.[46]

SES requires that spacecraft manufacturers assess the probability of micrometeorite damage that can cause any loss of functionality. This probability is then factored into the ultimate spacecraft probability of success.

Any material risk identified through this assessment will be mitigated to ensure that the spacecraft meets SES's mission reliability and probability-of-success requirements.[47]

13.2. Minimizing Accidental Explosions

SES will assess and limit the probability of accidental explosions during and after the completion of mission operations.[48] Propellant tanks and thrusters will be designed consistent with standard industry practices. The satellites will be designed such that all energy sources, including chemical, pressure, and kinetic energy, can be removed at the end of life by depleting residual fuel, leaving all fuel line valves open, and venting all pressurized systems. The design will also enable SES to leave all batteries in a permanently discharged state and remove all other remaining stored energy sources.

13.3. Safe Flight Profiles

SES will continually assess and limit the probability of a satellite becoming a source of debris by collision with large debris or other space vehicles.[49] The orbital parameters, including the apogee, perigee, inclination, and the right ascension of the ascending node of the constellation will be accurately maintained using propulsion to allow sufficient spacing with other MEO constellations to minimize the risk of collision with other MEO satellites.

The O3bGEN3 inclined plane satellites will employ a Walker-Delta constellation configuration that maintains angular separation between satellites in adjacent orbital planes at plane-crossing locations, thereby preventing collisions between O3b spacecraft within the same shell.[50]

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[46] *Id.* § 25.114(d)(14)(ii).

[47] *See id.* § 25.114(d)(14)(vii)(D)(1).

[48] *Id.* § 25.114(d)(14)(iii).

[49] *Id.* § 25.114(d)(14)(iv).

[50] *Id.* § 25.114(d)(14)(iv)(A)(2).

The altitude of each shell will be selected within the limits permitted by the applicable ITU filings to maintain a minimum separation of 10 km between the apogee of the lower shell and the perigee of the upper shell. The design will also maintain a minimum separation of 10 km from the operational O3bGEN1 satellites at approximately 8,062 km altitude.

Below is the targeted minimum accuracy of each satellite's orbital parameters, while in their operational orbit.[51]

Table 5: Minimum Accuracy of Each Satellite's Orbital Parameters

Parameter	Accuracy
Apogee	± 5 km
Perigee	± 5 km
Inclination	± 3 deg
Eccentricity	<0.001
Right Ascension of Ascending Node	± 3 deg

SES satellites will be equipped with onboard propulsion systems capable of performing collision avoidance maneuvers. SES will evaluate and mitigate conjunction events with a predicted collision probability greater than 1×10^{-5} throughout the mission.[52]

SES will use this system for active avoidance of other spacecraft and tracked inert objects, including during deorbiting and at the post-mission disposal stage. The operational altitude of SES's system and SES's post-mission disposal plans will avoid transit through orbits used by inhabitable spacecraft, including the International Space Station.[53]

Upon receipt of a Conjunction Data Message from the 18th Space Defense Squadron, SES will promptly assess the conjunction risk and implement mitigation measures when warranted, including by sharing ephemeris data.[54]

SES does not intend to engage in planned proximity operations.[55]

SES will track each satellite and identify the satellites from the ground.[56] After orbital insertion, SES satellites will activate onboard Global Navigation Satellite System receivers and TT&C

[51] *Id*. § 25.114(d)(14)(iv)(A)(4).

[52] *Id*. § 25.114(d)(14)(iv)(A)(1).

[53] *Id*. § 25.114(d)(14)(iv)(A)(3).

[54] *Id*. § 25.114(d)(14)(iv)(A)(5).

[55] *Id*. § 25.114(d)(14)(vi).

[56] *Id*. § 25.114(d)(14)(v).

carriers to establish health and safety and navigation status. Following signal acquisition, SES will actively track these satellites through on-board telemetry, which will include identification and navigation data. SES will register its satellites with the 18th Space Defense Squadron and, to the extent necessary, share ephemeris data with the 18th Space Defense Squadron or successor entity, other entities that engage in space situational awareness or space traffic management functions, and/or other operators.[57]

13.4. Post-Mission Disposal

SES will follow industry standards in determining the sufficient amount of fuel to reserve for the post-mission disposal maneuvers of O3bGEN3 satellites. SES will assess fuel-gauging uncertainty and provide an adequate margin of fuel reserve to address the assessed uncertainty. SES will assess the probability of success of post-mission disposal and take steps to achieve a probability of success for any individual space station of 0.9 or better.[58]

The O3bGEN3 satellites will be designed to be maneuvered to an end-of-life disposal orbit that is stable for at least 100 years and not interfere with the orbits of operating spacecraft.[59]

Accordingly, the end-of-life disposal orbit will be near-circular in the current orbital plane, and at a sufficiently different orbit altitude, either lower than 7800 km or higher than 8200 km, thereby preventing end-of-life spacecraft from re-crossing the SES operational altitude of approximately 8,062 km for at least 100 years.

The selected disposal orbit avoids both the LEO and GEO protected regions and supports the long-term sustainability of the space environment.

[57] *Id.* § 25.114(d)(14)(v)(B)-(C).

[58] *Id.* § 25.114(d)(14)(v)(D)(1).

[59] *Id.* § 25.114(d)(14)(vii)(C).

Engineering Statement

I hereby certify that I am the technically qualified person responsible for the preparation of the engineering information contained in this Application, that I am familiar with Part 25 of the Commission's rules, that I have either prepared or reviewed the engineering information submitted in this application, and that it is complete and accurate to the best of my knowledge and belief.

/s/ Giselle Creeser
Director, Spectrum Engineering, Americas
SES

July 6, 2026

Exhibit 1

This exhibit presents the results of the Ka-band interference analyses from SES's O3bGEN3 system into other Ka-band Second Round NGSO systems. The methodology, assumptions, and system specifications are provided below.

NGSO systems analyzed:

- Telesat LightSpeed:
  - Downlink: Gateway and User Terminals
  - Uplink: Gateway and User Terminals
- Amazon Kuiper:
  - Downlink: Gateway and User Terminals
  - Uplink: Gateway and User Terminals
- SpaceX Starlink Gen2:
  - Downlink: Gateway and User Terminals
  - Uplink: Gateway Terminals
- OneWeb:
  - Downlink: Gateway Terminals
  - Uplink: Gateway Terminals
- Mangata:
  - Downlink: Gateway and User Terminals
  - Uplink: Gateway and User Terminals

SES assessed short-term and long-term interference using Monte Carlo simulations that calculate the signal-to-noise ("C/N") and signal-to-noise and interference ("C/(N+I)") statistics for the user and gateway links of the interfered-with system.[1] The characteristics of the NGSO systems were obtained from publicly available references. Other assumptions for the analysis come from the Commission's *NGSO/NGSO Spectrum Sharing Order* addressing compatibility showing.[2]

The analysis assumed that the proposed O3bGEN3 satellites and the interfered-with systems had collocated earth stations, that the O3bGEN3 satellites did not employ mitigation actions with respect to the interfered-with system, and that no interference from other sources into the

[1] This methodology was first used by SpaceX and approved by the Commission. *See* Letter from Jayson L. Cohen, Director, Satellite Policy, Space Exploration Technologies Corp., to Marlene H. Dortch, Secretary, FCC, IB Docket 21-456, Attachment (filed July 25, 2024); *Revising Spectrum Sharing Rules for Non-Geostationary Orbit, Fixed-Satellite Service Systems*, Second Report and Order and Order on Reconsideration, 39 FCC Rcd 12656 ¶¶ 1, 15, 30 (2024) ("*NGSO/NGSO Spectrum Sharing Order*").

[2] *See generally NGSO/NGSO Spectrum Sharing Order*.

interfered-with system existed. The simulations used 18.6 GHz for downlink and 29.0 GHz for uplink.

The analysis was performed in three locations: Washington, DC; Las Vegas, NV; and Miami, FL. These sites were chosen because they present three distinct sets of atmospheric attenuation profiles at three different latitudes.

Table 1: List of Locations

Location	Latitude (°N)	Longitude (°E)	Rain Condition
Washington, DC	38.91	-77.04	Medium Rain
Las Vegas, NV	36.17	-115.14	Low Rain
Miami, FL	25.76	-80.19	High Rain

Interference Simulation and Analysis Methodology

SES designed its simulation steps to allow computation of dual-criteria degraded throughput, where the values of short- and long-term interference metrics are computed using C/N and C/(N+I) statistical data. SES used 500,000 time steps of one second each (almost six days) for each simulation. During the simulation, SES propagated each satellite system one second at each time step to find the instantaneous satellite configurations. SES employed a random tracking strategy at each time step to model each system's selection of satellites. At each time step, an earth station under examination randomly picked co-frequency satellites, up to the maximum number of co-frequency satellites, from its pool of eligible satellites. To replicate the operational circumstances for each system, SES only considered a satellite to be eligible for communication with an earth station if its elevation angle was greater than or equal to the minimum permissible elevation angle for the system. SES also assumed complete bandwidth overlap and same polarization to enable analysis on a per-Hertz basis without the potential for discrimination.

Then SES computed the C/N and C/(N+I) values at each time step of a simulation, for each interfered-with downlink (to earth station) and each interfered-with uplink (to space station). For the C/N and C/(N+I) values calculated at a time step, SES incorporated the main atmospheric attenuation contributions that an interfered-with system may experience, using Recommendation ITU-R P.618-14 and referenced recommendations therein. SES employed the same uniformly sampled unavailability probability (p) for both systems' attenuation calculations. For the downlink, SES adjusted the noise power of the interfered-with earth station to account for atmospheric attenuation according to Recommendation ITU-R P.618-14.

SES accumulated the paired values from each C/N and C(N+I) calculation at a time step in an array during the simulation. After sorting and processing these arrays for each interfered-with uplink and downlink, SES created cumulative distribution functions, enabling the computation of short- and long-term interference statistics for the scenarios under consideration. SES assessed the long-term and short-term interference impact into the different Round 2 constellations, based

on the interference protection criterion adopted by the Commission, which assumes 3% time-weighted average throughput degradation as a long-term interference protection criterion and a 0.4% absolute increase in link unavailability as a short-term interference protection criterion.[3]

O3bGEN3 Parameters

Table 2: O3bGEN3 Orbital Configuration

Number of Planes	Satellites per Plane	Altitude (km)	Inclination (º)
1	2	8062	0
6	8	8062	55
3	8	8062	49

The O3bGEN3 operational parameters described in Tables 3 and 4 depict a set of representative operational parameters, which should not be considered as maximum or minimum operational parameters of the system.

Table 3: O3bGEN3 Operational Downlink Parameters

	User Terminal	Gateway
Frequency (GHz)	18.6	18.6
PFD on ground (dBW/m2/Hz)	-175	-185
Transmission Strategy	Constant PFD on ground	Constant PFD on ground
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	30	10
Number of co-frequency satellites - Nco	1	3

Table 4: O3bGEN3 Operational Uplink Parameters

	User Terminal	Gateway
Frequency (GHz)	29	29
Power Spectral Density input into the antenna (dBW/Hz)	-79	-80
Peak Tx Antenna Gain (dBi)	47.4	55
Antenna Size (m)	1	2.4
Antenna Pattern	ITU Appendix 8	ITU Appendix 8

[3] *Id.* ¶ 1.

Transmission Strategy	Constant EIRP density	Constant EIRP density
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	30	10
Number of co-frequency satellites - Nco	1	3

Compatibility Analysis with Telesat – LightSpeed

LightSpeed parameters were derived from the following sources of information:

- SAT-MPL-20200526-00053
- SAT-APL-20260202-00075
- Assumptions from the *NGSO/NGSO Spectrum Sharing Order*

Table 5: LightSpeed Orbital Configuration

Number of Planes	Satellites per Plane	Altitude (Km)	Inclination (º)
6	13	1015	98.98
20	11	1325	50.88

Table 6: LightSpeed Downlink Parameters

	User Terminal	Gateway
Frequency (GHz)	18.6	18.6
PFD on ground (dBW/m2/Hz)	-187.5	-187.5
Transmission Strategy	Constant PFD on ground	Constant PFD on ground
Max. Antenna Gain (dBi)	43.5	51.2
Antenna Size (m)	1	2.4
Antenna Pattern	ITU Appendix 8	ITU Appendix 8
Noise Temperature (K)	200	200
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	10	10

Table 7: LightSpeed Uplink Parameters

	User Terminal	Gateway
Frequency (GHz)	29	29
EIRP Density (dBW/Hz)	-26.5	-21
Max. Rx Sat. Antenna Gain (dBi)	31.8	31.8
Satellite Noise Temp. (K)	500	500
Transmission Strategy	Constant EIRP density	Constant EIRP density
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	10	10

Table 8: LightSpeed Compatibility Analysis Results

Transmission	Interf	Victim	Location		Spect. Eff. (C/N) (bps/Hz)	Spect. Eff. (C/N+I) (bps/Hz)	Average Th. Degrad	Unavailab. (C/N) %	Unavailab. (C/N+I) %	Absolute Increase. Unavail. %
DL	User	User	Washington		3.218	3.206	0.377	99.935	99.925	0.010
DL	User	User	Miami		3.203	3.191	0.383	99.654	99.643	0.011
DL	User	User	Vegas		3.267	3.256	0.340	99.993	99.980	0.013
DL	User	GW	Washington		5.131	5.121	0.195	99.981	99.980	0.001
DL	User	GW	Miami		5.111	5.101	0.196	99.849	99.847	0.002
DL	User	GW	Vegas		5.189	5.180	0.179	99.999	99.997	0.002
DL	GW	User	Washington		3.219	3.209	0.311	99.933	99.916	0.017
DL	GW	User	Miami		3.204	3.196	0.271	99.683	99.670	0.013
DL	GW	User	Vegas		3.266	3.257	0.287	99.992	99.976	0.016
DL	GW	GW	Washington		5.131	5.123	0.164	99.980	99.978	0.002
DL	GW	GW	Miami		5.111	5.104	0.143	99.843	99.841	0.002
DL	GW	GW	Vegas		5.189	5.181	0.149	99.999	99.996	0.003
UL	User	User	Washington		4.036	4.035	0.015	99.858	99.858	0.000
UL	User	User	Miami		3.876	3.876	0.014	99.481	99.481	0.000
UL	User	User	Vegas		4.054	4.053	0.014	99.982	99.982	0.000
UL	User	GW	Washington		5.363	5.363	0.005	99.925	99.925	0.000
UL	User	GW	Miami		5.200	5.200	0.005	99.637	99.637	0.000
UL	User	GW	Vegas		5.391	5.391	0.005	99.991	99.991	0.000
UL	GW	User	Washington		4.035	4.034	0.041	99.858	99.857	0.001
UL	GW	User	Miami		3.877	3.876	0.033	99.484	99.483	0.000
UL	GW	User	Vegas		4.054	4.052	0.037	99.985	99.985	0.000
UL	GW	GW	Washington		5.365	5.363	0.024	99.912	99.912	0.000
UL	GW	GW	Miami		5.200	5.199	0.019	99.630	99.630	0.000
UL	GW	GW	Vegas		5.392	5.390	0.022	99.992	99.992	0.000

Compatibility Analysis with Amazon – Kuiper

Kuiper parameters were derived from the following sources of information:

- SAT-LOA-20190704-00057
- Assumptions from the *NGSO/NGSO Spectrum Sharing Order*

Table 9: Kuiper Orbital Configuration

Number of Planes	Satellites per Plane	Altitude (Km)	Inclination (º)
28	28	590	33
36	36	610	42
34	34	630	51.9

Table 10: Kuiper Downlink Parameters

	User Terminal	Gateway
Frequency (GHz)	18.6	18.6
PFD on ground (dBW/m2/Hz)	-173	-183
Transmission Strategy	Constant PFD on ground	Constant PFD on ground
Max. Antenna Gain (dBi)	43.5	51.2
Antenna Size (m)	1	2.4
Antenna Pattern	ITU Appendix 8	ITU Appendix 8
Noise Temperature (K)	200	200
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	35	20

Table 11: Kuiper Uplink Parameters

	User Terminal	Gateway
Frequency (GHz)	29	29
EIRP Density (dBW/Hz)	-38	-26.22
Max. Rx Sat. Antenna Gain (dBi)	37	38.2
Satellite Noise Temp. (K)	500	500
Transmission Strategy	Constant EIRP density	Constant EIRP density
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	20	10

Table 12: Kuiper Compatibility Analysis Results

Transmission	Interf	Victim	Location		Spect. Eff. (C/N) (bps/Hz)	Spect. Eff. (C/N+I) (bps/Hz)	Average Th. Degrad	Unavailab. (C/N) %	Unavailab. (C/N+I) %	Absolute Increase. Unavail. %
DL	User	User	Washington		5.939	5.932	0.125	99.997	99.997	0.000
DL	User	User	Miami		5.932	5.924	0.119	99.988	99.988	0.000
DL	User	User	Vegas		5.943	5.938	0.085	100.000	100.000	0.000
DL	User	GW	Washington		5.926	5.921	0.085	99.993	99.990	0.003
DL	User	GW	Miami		5.908	5.903	0.076	99.974	99.972	0.002
DL	User	GW	Vegas		5.942	5.937	0.074	100.000	99.997	0.003
DL	GW	User	Washington		5.939	5.938	0.027	99.996	99.996	0.000
DL	GW	User	Miami		5.931	5.930	0.028	99.991	99.991	0.000
DL	GW	User	Vegas		5.943	5.942	0.022	100.000	100.000	0.000
DL	GW	GW	Washington		5.926	5.923	0.045	99.994	99.994	0.000
DL	GW	GW	Miami		5.907	5.905	0.043	99.972	99.972	0.000
DL	GW	GW	Vegas		5.942	5.939	0.039	100.000	100.000	0.000
UL	User	User	Washington		4.739	4.724	0.320	99.955	99.942	0.013
UL	User	User	Miami		4.715	4.702	0.284	99.845	99.836	0.009
UL	User	User	Vegas		4.724	4.712	0.246	99.996	99.988	0.008
UL	User	GW	Washington		5.934	5.934	0.009	99.976	99.976	0.000
UL	User	GW	Miami		5.920	5.919	0.009	99.906	99.906	0.000
UL	User	GW	Vegas		5.943	5.942	0.008	99.999	99.999	0.000
UL	GW	User	Washington		4.738	4.715	0.473	99.952	99.944	0.008
UL	GW	User	Miami		4.716	4.696	0.406	99.850	99.843	0.007
UL	GW	User	Vegas		4.723	4.705	0.383	99.997	99.992	0.005
UL	GW	GW	Washington		5.934	5.932	0.028	99.975	99.974	0.000
UL	GW	GW	Miami		5.920	5.918	0.028	99.908	99.907	0.001
UL	GW	GW	Vegas		5.943	5.941	0.025	99.999	99.999	0.000

Compatibility Analysis with SpaceX – Starlink Gen-2

Starlink Gen-2 parameters were derived from the following sources of information:

- SAT-AMD-20210818-00105
- SAT-MOD-20241011-00224
- Assumptions from the *NGSO/NGSO Spectrum Sharing Order*

Table 13: Starlink Gen-2 Orbital Configuration[4]

Number of Planes	Satellites per Plane	Altitude (Km)	Inclination (º)
56	90	480	53
56	120	485	43
28	60	475	32
72	50	340	53
72	50	345	48
72	50	355	43
72	50	350	38
18	58	365	32
30	32	360	96.9
12	12	604	148

Table 14: Starlink Gen-2 Downlink Parameters

	User Terminal	Gateway
Frequency (GHz)	18.6	18.6
PFD on ground (dBW/m2/Hz)	-173.3	-185.3
Transmission Strategy	Constant PFD on ground	Constant PFD on ground
Max. Antenna Gain (dBi)	43.5	51.2
Antenna Size (m)	1	2.4
Antenna Pattern	ITU Appendix 8	ITU Appendix 8
Noise Temperature (K)	200	200
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	10	10

[4] SpaceX provided four representative orbital configurations in its Gen2 application. SES selected Example 2 for this analysis. *See* Space Exploration Holdings, LLC, ICFS File No. SAT-MOD-20241011-00224, Annex 1 (filed Oct. 11, 2024).

Table 15: Starlink Gen-2 Uplink Parameters

	Gateway
Frequency (GHz)	29
EIRP Density (dBW/Hz)	-31.5
Max. Rx Sat Antenna Gain (dBi)	38.3
Satellite Noise Temp. (K)	500
Transmission Strategy	Constant EIRP density
Tracking Strategy	Random
GSO Exclusion Angle (º)	0
Minimum Elevation Angle (º)	10

Table 16: Starlink Gen-2 Compatibility Analysis Results

Transmission	Interf	Victim	Location		Spect. Eff. (C/N) (bps/Hz)	Spect. Eff. (C/N+I) (bps/Hz)	Average Th. Degrad	Unavailab. (C/N) %	Unavailab. (C/N+I) %	Absolute Increase. Unavail. %
DL	User	User	Washington		5.931	5.929	0.026	99.986	99.986	0.000
DL	User	User	Miami		5.909	5.907	0.028	99.896	99.896	0.000
DL	User	User	Vegas		5.942	5.941	0.028	100.000	100.000	0.000
DL	User	GW	Washington		5.732	5.724	0.137	99.981	99.981	0.001
DL	User	GW	Miami		5.717	5.708	0.157	99.870	99.869	0.001
DL	User	GW	Vegas		5.802	5.794	0.125	99.999	99.998	0.001
DL	GW	User	Washington		5.931	5.929	0.033	99.989	99.989	0.000
DL	GW	User	Miami		5.909	5.907	0.033	99.911	99.911	0.000
DL	GW	User	Vegas		5.942	5.940	0.033	100.000	100.000	0.000
DL	GW	GW	Washington		5.732	5.724	0.145	99.980	99.979	0.001
DL	GW	GW	Miami		5.716	5.708	0.146	99.873	99.873	0.000
DL	GW	GW	Vegas		5.802	5.793	0.145	99.998	99.998	0.000
UL	User	GW	Washington		5.765	5.764	0.015	99.928	99.928	0.000
UL	User	GW	Miami		5.728	5.727	0.017	99.663	99.663	0.000
UL	User	GW	Vegas		5.821	5.820	0.014	99.995	99.995	0.000
UL	GW	GW	Washington		5.764	5.756	0.129	99.923	99.921	0.002
UL	GW	GW	Miami		5.726	5.719	0.128	99.652	99.650	0.002
UL	GW	GW	Vegas		5.821	5.813	0.135	99.994	99.990	0.004

Compatibility Analysis with OneWeb2

OneWeb2 parameters were derived from the following sources of information:

- SAT-APL-20210112-00007
- Assumptions from the *NGSO/NGSO Spectrum Sharing Order*

Table 17: OneWeb2 Orbital Configuration

Number of Planes	Satellites per Plane	Altitude (Km)	Inclination (º)
36	49	1200	87.9
32	72	1200	40
32	72	1200	55

Table 18: OneWeb2 Downlink Parameters

	Gateway
Frequency (GHz)	18.6
PFD on ground (dBW/m2/Hz)	-194.8
Transmission Strategy	Constant PFD on ground
Max. Rx Antenna Gain (dBi)	51.2
Antenna Size (m)	2.4
Antenna Pattern	ITU Appendix 8
Noise Temperature (K)	200
Tracking Strategy	Random
GSO Exclusion Angle (º)	0
Minimum Elevation Angle (º)	5

Table 19: OneWeb2 Uplink Parameters

	Gateway
Frequency (GHz)	29
EIRP Density (dBW/Hz)	-7.8
Max. Rx Sat Antenna Gain (dBi)	38
Satellite Noise Temp. (K)	500
Transmission Strategy	Constant EIRP density
Tracking Strategy	Random
GSO Exclusion Angle (º)	0
Minimum Elevation Angle (º)	5

Table 20: OneWeb2 Compatibility Analysis Results

Transmission	Interf	Victim	Location		Spect. Eff. (C/N) (bps/Hz)	Spect. Eff. (C/N+I) (bps/Hz)	Average Th. Degrad	Unavailab. (C/N) %	Unavailab. (C/N+I) %	Absolute Increase. Unavail. %
DL	User	GW	Washington		3.292	3.285	0.192	99.897	99.890	0.007
DL	User	GW	Miami		3.280	3.273	0.222	99.577	99.567	0.010
DL	User	GW	Vegas		3.354	3.347	0.197	99.988	99.979	0.009
DL	GW	GW	Washington		3.291	3.286	0.152	99.900	99.893	0.008
DL	GW	GW	Miami		3.280	3.274	0.175	99.574	99.567	0.007
DL	GW	GW	Vegas		3.354	3.348	0.154	99.987	99.977	0.010
UL	User	GW	Washington		5.938	5.938	0.000	99.968	99.968	0.000
UL	User	GW	Miami		5.921	5.921	0.000	99.800	99.800	0.000
UL	User	GW	Vegas		5.943	5.943	0.000	99.996	99.996	0.000
UL	GW	GW	Washington		5.938	5.937	0.000	99.966	99.966	0.000
UL	GW	GW	Miami		5.920	5.920	0.000	99.792	99.792	0.000
UL	GW	GW	Vegas		5.943	5.943	0.000	99.998	99.998	0.000

Compatibility Analysis with Mangata

Mangata parameters were derived from the following sources of information:

- SAT-PDR-20200526-00054
- Assumptions from the *NGSO/NGSO Spectrum Sharing Order*

Table 21: Mangata Orbital Configuration

Number of Planes	Satellites per Plane	Altitude (Km)	Inclination (º)
9	21	6400	45
9	21	6400	50
9	21	6400	52.5
8	7	1215 x 11585	63.4
8	7	1776 x 11024	63.4
8	7	3000 x 9800	63.4
8	7	3800 x 9000	63.4

Table 22: Mangata Downlink Parameters

	User Terminal	Gateway
Frequency (GHz)	18.6	18.6
PFD on ground (dBW/m2/Hz)	-195	-195
Transmission Strategy	Constant PFD	Constant PFD
Max. Antenna Gain (dBi)	43.5	51.2
Antenna Size (m)	1	2.4
Antenna Pattern	ITU Appendix 8	ITU Appendix 8
Noise Temperature (K)	200	200
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	15	20

Table 23: Mangata Uplink Parameters

	User Terminal	Gateway
Frequency (GHz)	29	29
EIRP Density (dBW/Hz)	-32.9	-32.9
Max. Rx Antenna Gain (dBi)	46.5	46.5
Satellite Noise Temp. (K)	500	500
Transmission Strategy	Constant EIRP density	Constant EIRP density
Tracking Strategy	Random	Random
GSO Exclusion Angle (º)	0	0
Minimum Elevation Angle (º)	15	20

Table 24: Mangata Compatibility Analysis Results

Transmission	Interf	Victim	Location		Spect. Eff. (C/N) (bps/Hz)	Spect. Eff. (C/N+I) (bps/Hz)	Average Th. Degrad	Unavailab. (C/N) %	Unavailab. (C/N+I) %	Absolute Increase. Unavail. %
DL	User	User	Washington		1.708	1.691	0.985	99.740	99.568	0.172
DL	User	User	Miami		1.702	1.684	1.050	99.345	99.148	0.197
DL	User	User	Vegas		1.739	1.722	0.968	99.964	99.786	0.178
DL	User	GW	Washington		3.280	3.264	0.516	99.971	99.945	0.026
DL	User	GW	Miami		3.271	3.253	0.572	99.879	99.838	0.041
DL	User	GW	Vegas		3.316	3.300	0.505	99.997	99.970	0.027
DL	GW	User	Washington		1.708	1.700	0.465	99.747	99.687	0.060
DL	GW	User	Miami		1.702	1.693	0.531	99.307	99.214	0.093
DL	GW	User	Vegas		1.739	1.730	0.472	99.969	99.903	0.066
DL	GW	GW	Washington		3.280	3.272	0.228	99.967	99.954	0.013
DL	GW	GW	Miami		3.271	3.263	0.256	99.895	99.881	0.014
DL	GW	GW	Vegas		3.316	3.309	0.210	99.996	99.989	0.007
UL	User	User	Washington		3.378	3.377	0.040	99.910	99.910	0.000
UL	User	User	Miami		3.352	3.350	0.041	99.640	99.640	0.000
UL	User	User	Vegas		3.411	3.410	0.029	100.000	100.000	0.000
UL	User	GW	Washington		3.431	3.430	0.042	99.880	99.880	0.000
UL	User	GW	Miami		3.402	3.400	0.044	99.710	99.710	0.000
UL	User	GW	Vegas		3.468	3.466	0.056	100.000	100.000	0.000
UL	GW	User	Washington		3.375	3.372	0.083	99.890	99.890	0.000
UL	GW	User	Miami		3.343	3.340	0.083	99.640	99.640	0.000
UL	GW	User	Vegas		3.412	3.409	0.068	99.990	99.990	0.000
UL	GW	GW	Washington		3.430	3.428	0.063	99.900	99.900	0.000
UL	GW	GW	Miami		3.396	3.393	0.074	99.640	99.630	0.010
UL	GW	GW	Vegas		3.454	3.451	0.064	99.960	99.960	0.000