

Overview

The Commission granted Space Exploration Holdings, LLC authority to launch and operate a second-generation (“Gen2”) system of up to 15,000 satellites using certain Ka-, V-, E-, and W-band frequencies to backhaul traffic for millions of American consumers, enterprises, and first responders.¹ The Commission also granted Space Exploration Holdings, LLC a modification to launch and operate a first-generation (“Gen1”) system of up to 4,408 satellites using Ka- and E-band frequencies for similar backhaul purposes.² In this application, filed by a sister company, SpaceX Services, Inc. (“SpaceX”), SpaceX seeks authority to operate a gateway earth station site having quad-band (Ka-, V-, E-, and W-bands) antennas to deliver broadband data between the satellites of its Gen1 and Gen2 non-geostationary satellite orbit (“NGSO”) systems and terrestrial Internet exchange points.³ Relevant technical and location information is attached in Schedule B Form 312.

The gateway site will contain up to forty antennas. Each quad-band antenna has a 1.99-meter parabolic dish capable of steering its beams to track NGSO satellites passing within its field of view and transmitting simultaneously in all four bands. This allows the gateway site to connect to as many independent NGSO satellites as possible at any given instant in time, delivering higher data transmission rates and improved customer connectivity to meet the growing consumer demand for high-speed, low-latency satellite broadband and ubiquitous mobile communications. This site will operate consistent with SpaceX’s associated space station authorizations⁴ and comply with antenna radiation pattern S.580.⁵

To align SpaceX’s gateway earth station operations with operations the Commission found in the public interest in the *Gen2 Upgrade Order* and maximize the value of this gateway earth station for consumers, SpaceX requests waivers of Section 2.106 and other applicable operating conditions to permit non-conforming use in certain frequencies. As demonstrated below, good cause exists for the Commission to grant these waiver requests for earth station operations.

¹ *Space Exploration Holdings, LLC Application for Authority for Modification of the SpaceX NGSO Satellite System, Order and Authorization*, DA 26-36 (Jan. 9, 2026) (“*Gen2 Upgrade Order*”).

² *Space Exploration Holdings, LLC, Application for Modification of Authorization for the SpaceX Gen1 NGSO Satellite System*, Stamp Grant, ICFS File No. SAT-MOD-20250805-00200 (reissued Apr. 10, 2026) (“*Gen1 Upgrade Grant*”).

³ With this application, SpaceX submits a request for special temporary authority to operate this earth station gateway site under the same parameters outlined in this application pursuant to the Space Bureau’s temporary processing procedures for earth station applications seeking special temporary authority. *See Space Bureau Announces Temporary Expedited Processing Procedures for Earth Station Applications Seeking Special Temporary Authority*, SB Docket No. 25-207, Public Notice, 40 FCC Rcd 1558 (SB 2025); *Space Bureau Announces One Year Extension of Temporary Expedited Processing Procedures for Earth Station Applications Seeking Special Temporary Authority*, SB Docket No. 25-207, Public Notice, DA 26-192 (SB rel. Feb. 26, 2026).

⁴ *See generally Gen2 Upgrade Order; Gen1 Upgrade Grant.*

⁵ Rec. ITU-R S.580-6, *Radiation diagrams for use as design objectives for antennas of earth stations operating with geostationary satellites* (Jan. 2004), https://www.itu.int/dms_pubrec/itu-r/rec/s/r-rec-s.580-6-200401-i!!pdf-e.pdf.

Spectrum Sharing

Ka-band

SpaceX seeks authority to operate using Ka-band frequencies authorized under the *Gen2 Upgrade Order*. In the 17.3-17.8, 18.3-18.6, 18.6-18.8, 18.8-19.3, 19.3-19.7, 19.7-20.2, 28.35-29.1, 29.1-29.5, and 29.5-30.0 GHz bands where FSS is allocated on a primary or co-primary basis, SpaceX seeks to operate on a primary basis. In the 17.8-18.3 GHz band where FSS is allocated on a secondary basis, SpaceX seeks to operate on a secondary basis. In the 19.7-20.2 and 29.5-30.0 GHz bands, SpaceX seeks to conduct MSS as well as FSS operations in accordance with the conditions specified in the *Gen2 Upgrade Order*.⁶ Additionally, SpaceX will coordinate and conduct MSS as well as FSS operations in the 29.1-29.5 GHz band in accordance with the conditions specified in the *Gen2 Upgrade Order*⁷ and applicable rules for additional NGSO MSS satellite systems in the band.⁸ SpaceX's years of experience operating two NGSO FSS systems with thousands of satellites demonstrates that SpaceX's earth stations can share spectrum with other terrestrial and NGSO and GSO satellite licensees in Ka-band spectrum without causing harmful or unacceptable interference, and SpaceX will build upon this experience for its NGSO MSS feeder links. In the 27.5-28.35 GHz band, SpaceX does not seek to meet the criteria under Section 25.136(a) to operate without providing additional interference protection for stations in the Upper Microwave Flexible Use Service.

V-band

SpaceX seeks authority to operate using V-band frequencies authorized under the *Gen2 Upgrade Order*. In the 37.5-42.0, 47.2-50.2, and 50.4-51.4 GHz bands where FSS is allocated on a co-primary basis, SpaceX seeks to operate on a primary basis. In the 39.5-40.5, 40.5-41.0, and 50.4-51.4 GHz bands, SpaceX seeks to conduct MSS as well as FSS operations in accordance with the operations authorized in the *Gen2 Upgrade Order*.⁹ In the 37.5-40.0, 47.2-48.2, and 50.4-51.4 GHz bands, SpaceX has demonstrated compliance with Sections 25.136(b)-(c), (d), and (e), respectively, to operate without providing additional interference protection for stations in the Upper Microwave Flexible Use Service.

E-band

SpaceX seeks authority to operate using E-band frequencies authorized under the *Gen2 Upgrade Order*. In the 71.0-76.0 and 81.0-86.0 GHz bands where FSS is allocated on a co-primary basis, SpaceX seeks to operate on a primary basis. In the 71.0-74.0 and 81.0-84.0 GHz bands,

⁶ See *Gen2 Upgrade Order*, Grant Conditions 3(d), 11 & ¶ 12.

⁷ *Id.*

⁸ See 47 C.F.R. §§ 25.203(k), 25.257(d), 25.258(c). The Commission adopted the NGSO MSS feeder link rules for these bands 30 years ago “to accommodate” the specific parameters and sharing agreement of two legacy satellite systems—Motorola/Iridium and TRW—including system-specific site caps, coordination distances, and other system-specific restrictions. But the Commission did not apply those system-specific sharing rules to future NGSO MSS feeder link operators that may apply to use the bands. Instead, the Commission requires new NGSO MSS feeder links to coordinate with other users in the band, as the Commission requires of SpaceX in the *Gen2 Upgrade Order*. SpaceX will coordinate its operations in good faith with existing licensees, including Iridium, to promote efficient and intensive use of this critical shared satellite spectrum.

⁹ See *Gen2 Upgrade Order*, p. 4, n. 16, Grant Conditions 5(b), 11 & ¶ 12.

SpaceX seeks to conduct MSS as well as FSS operations in accordance with the operations authorized in the *Gen2 Upgrade Order*.¹⁰ To comply with the Commission's coordination rules under Section 25.203(c), SpaceX conducted an interference analysis in accordance with the procedures set forth in Section 25.251 and the interference protection criteria for 70/80 GHz terrestrial links provided in Part 101. Greater detail is available in the coordination report submitted with this application or appended thereafter. SpaceX will coordinate with incumbent, primary users, federal users, and passive services and take all practicable steps to protect against harmful interference in accordance with Section 2.106, US342, US389. SpaceX will register this gateway earth station site in the 70/80/90 GHz band database through a third-party link registration service to ensure that the new link will not cause interference to any previously registered links and to facilitate efficient coordination and coexistence with future users of these bands.

W-band

SpaceX seeks authority to operate using W-band frequencies authorized under the *Gen2 Upgrade Order*. Consistent with the *Gen2 Upgrade Order*, SpaceX seeks to operate in these bands on an unprotected, non-interference basis.¹¹ In the 92.0-94.0 and 94.1-95.0 GHz bands, SpaceX will coordinate with incumbent, primary users, federal users, and passive services and take all practicable steps to protect from harmful interference in accordance with Section 2.106, US161, US342, respectively. SpaceX will register this gateway earth station site in the 70/80/90 GHz band database through a third-party link registration service to facilitate efficient coordination and coexistence with future users of these bands.

FAA Notification

The proposed 1.99-meter antennas are exempt from notification to the Federal Aviation Administration under Section 17.7(e)(3) of the Commission's rules because the height of the antenna is less than 6.1 meters above ground level.

Waiver Requests

As a part of its iterative approach to satellite design and development, SpaceX continues to seek innovative and more efficient uses of spectrum to achieve its mission to ensure that every person in the world can access high-quality broadband service and ubiquitous mobile connectivity wherever they live, work, or travel. To deliver these benefits as swiftly as possible, SpaceX requests several waivers of the Commission's rules that align with waivers the Commission found to be in the public interest when granting SpaceX's *Gen2 Upgrade Order*. Granting these conforming waivers here will enable the upgraded systems and quad-band antennas to deliver gigabit-speed, low-latency broadband, and ubiquitous mobile connectivity to all Americans and help close the digital divide for billions of people around the world, all while protecting incumbent users from harmful interference.

¹⁰ See *Gen2 Upgrade Order*, Grant Condition 11, ¶ 12.

¹¹ See *Gen2 Upgrade Order*, Grant Condition 7.

Pursuant to Section 1.3 of the Commission’s rules, the Commission may waive its rules for good cause shown.¹² “Waiver is appropriate if special circumstances warrant a deviation from the general rule and such deviation would better serve the public interest than would strict adherence to the general rule,” including “more effective implementation of overall policy.”¹³ In determining whether waiver is appropriate, the Commission should “take into account considerations of hardship, equity, or more effective implementation of overall policy.”¹⁴ As shown below, there is good cause for the Commission to grant a waiver, to the extent necessary, of Section 2.106 and other applicable operating conditions to use several frequency bands in a manner that does not conform to the Table of Frequency Allocations or Commission rules.

The Commission has recognized that “there may be benefits associated with operations not consistent with the current International Table of Frequency Allocations in certain circumstances.”¹⁵ Waivers of such allocations are generally granted “when there is little potential for interference into any service authorized under the Table of Frequency Allocations and when the non-conforming operator accepts any interference from authorized services.”¹⁶ The Commission, likewise, has permitted non-conforming uses where the operator agrees to comply with established technical limits known to protect other authorized services.¹⁷ Finally, the Commission has found that a waiver of the Table of Frequency Allocations is appropriate when an operator seeking the waiver has undertaken efforts to update the table.

The Commission already determined that waiving the Table of Frequency Allocations to permit SpaceX to conduct non-conforming use of frequency ranges in the Ka-, V-, E-, and W-bands requested herein will promote the public interest by dramatically enhancing the quality, coverage, and reliability of next-generation satellite service for consumers without causing harmful interference to other authorized services. Importantly, SpaceX focused its requests primarily—although not exclusively—on finding innovative ways to enhance the uplink capabilities of the Gen1 and Gen2 systems across the Ka-, V-, E-, and W-bands to promote the delivery of more symmetrical satellite broadband services to consumers, businesses, enterprises, and government users, most pressingly in areas that lack access to robust and reliable terrestrial fiber networks. Doing so will not only support bandwidth-intensive, real-time applications for

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

¹³ *GE American Communications, Inc.*, Order and Authorization, 16 FCC Rcd 11038, ¶ 9 (IB 2001) (quoting *WAIT Radio*, 418 F.2d at 1159).

¹⁴ *WAIT Radio*, 418 F.2d at 1159.

¹⁵ *Expediting Initial Processing of Satellite and Earth Station Applications*, Report and Order and Further Notice of Proposed Rulemaking, 38 FCC Rcd 8838, ¶ 26 (2023) (“*Satellite Processing Order*”).

¹⁶ *The Boeing Company*, Order and Authorization, 16 FCC Rcd 22645, ¶ 12 & n.48 (IB & OET 2001) (“*Boeing Authorization*”) (citations omitted) (quoting *Fugro-Chance, Inc.*, Order and Authorization, 10 FCC Rcd 2860, ¶ 2 (IB 1995)); *Letter from Jose P. Albuquerque & Mark Settle to Suzanne Malloy*, 30 FCC Rcd 4841, 4842 (IB & OET 2015).

¹⁷ *See, e.g., ContactMEO Communications, LLC*, Order and Authorization, 21 FCC Rcd 4035, ¶¶ 1, 26-27, 39 (IB 2006) (permitting NGSO FSS downlinks, from three or four satellites, in a GSO FSS band, conditioned on compliance with Article 22’s EPFD limit); *Northrop Grumman Space & Mission Systems Corporation*, Order and Authorization, 24 FCC Rcd 2330, ¶¶ 71, 76, 90 (IB 2009) (same); *Boeing Authorization*, ¶¶ 16-17 (permitting aeronautical MSS uplinks in FSS spectrum based on compliance with protection measures endorsed by Working Party 4A).

consumers, but will also ensure that American industries can access dedicated, fiber-like capacity even in the most remote corners of the country.

Until such time that the Commission or ITU updates the service allocations in these frequency bands to permit the satellite services requested herein, SpaceX will operate in these bands on an unprotected, non-interference basis with respect to authorized services in these bands, and has designed its next-generation gateways to efficiently share the spectrum with other satellite providers that may seek to use the bands. SpaceX thus limits its waiver requests below to the extent that operating in a frequency band does not conform to the Table of Frequency Allocations.

Finally, SpaceX will register this gateway earth station site through a third-party link registration service to facilitate efficient coordination and coexistence with incumbent and future users of these bands.

Ka-band

18.6-18.8 GHz. SpaceX proposes to use the 18.6-18.8 GHz band for earth station FSS downlink transmissions. In the *Gen2 Upgrade Order*, the Commission granted SpaceX's waiver request to permit FSS downlink operations in the band.¹⁸ SpaceX incorporates by reference that waiver request and the Commission's rationale for granting it herein.¹⁹ SpaceX seeks a conforming waiver of the Table of Frequency Allocations to permit earth station FSS downlink operations in the band.

The 18.6-18.8 GHz band is allocated globally for FSS (downlink) on a co-primary basis but is currently limited to GSO operations through footnotes NG164 and 5.522B. Granting a waiver supports the public interest for many of the same reasons that the Commission explained in authorizing NGSO operations in the 17.3-17.8 GHz band.²⁰ Authorizing SpaceX to operate downlinks in the 18.6-18.8 GHz band will enable SpaceX's quad-band antenna gateway to deliver fiber-like satellite broadband and more robust backhaul through additional contiguous Ka-band spectrum. From a technical perspective, granting a waiver will allow SpaceX to efficiently upgrade its existing hardware to make productive use of the 18.6-18.8 GHz band for consumers, since the Commission has already authorized SpaceX to use adjacent frequencies above and below 18.6-18.8 GHz.

Consistent with the operations and conditions authorized in the *Gen2 Upgrade Order*, SpaceX will operate in the 18.6-18.8 GHz band on an unprotected, non-interference basis with respect to co-primary authorized users, including GSO networks and Earth-exploration satellite service (passive).²¹ To the extent that other operators seek to use the band, SpaceX can leverage the same techniques that permit sharing in its adjacent, authorized bands to efficiently share the

¹⁸ See *Gen2 Upgrade Order*, Grant Condition 3(a).

¹⁹ See *Space Exploration Holdings, LLC, Application for Amendment of Application for the SpaceX Gen2 NGSO Satellite System*, ICFS File No. SAT-AMD-20241017-00228, Waiver Requests at 6-8 (filed Oct. 17, 2024) ("*SpaceX Gen2 Upgrade Amendment, Waiver Requests*"); *Gen2 Upgrade Order*, Grant Condition 3(a).

²⁰ See, e.g., *Gen2 Upgrade Order*, ¶¶ 9-10.

²¹ See *Gen2 Upgrade Order*, Grant Conditions 3(a), 10 & ¶¶ 9-10.

spectrum with other users. SpaceX will coordinate with incumbents and federal users and services in the band in accordance with the conditions specified in the *Gen2 Upgrade Order*.²²

19.4-19.6 GHz. In the *Gen2 Upgrade Order*, the Commission granted SpaceX authority to conduct FSS downlink operations in the 19.3-19.7 GHz band, including a waiver to permit non-feeder-link FSS downlink operations in the 19.4-19.6 GHz band.²³ SpaceX incorporates by reference that waiver request and the Commission's rationale for granting it herein.²⁴ To the extent necessary, SpaceX seeks a conforming waiver of the Table of Frequency Allocations to permit non-feeder-link FSS downlink operations in the 19.4-19.6 GHz band. SpaceX will operate and coordinate with incumbents and federal users and services in the band in accordance with the conditions specified in the *Gen2 Upgrade Order*.²⁵

29.1-29.5 GHz. SpaceX proposes to use the 29.1-29.5 GHz band for uplink FSS transmissions both as feeder links for its MSS operations—consistent with the Table of Frequency Allocations—and to use excess capacity to support its FSS operations. In the *Gen2 Upgrade Order*, the Commission granted SpaceX's waiver request to permit uplink transmissions in the 29.1-29.5 GHz band for FSS operations not limited to MSS feeder links.²⁶ SpaceX incorporates by reference that waiver request and the Commission's rationale for granting it herein.²⁷ SpaceX seeks a conforming waiver to align its earth station operations with the operations authorized in the *Gen2 Upgrade Order*.

The Commission has allocated the 29.1-29.25 GHz band to FSS (uplink) on a co-primary basis and the 29.25-29.5 GHz band to FSS (uplink) on a primary basis. However, FSS use of the 29.1-29.25 GHz and 29.25-29.5 GHz bands is limited to feeder links for MSS NGSO systems and for GSO networks in the 29.25-29.5 GHz segment.²⁸

SpaceX seeks a conforming waiver to align its earth station operations with the operations authorized in the *Gen2 Upgrade Order* so that SpaceX can make even more efficient and productive use of the 29.1-29.5 GHz band for consumers by using the band both as a feeder link for its requested MSS operations and to use excess capacity to support its FSS operations.²⁹ As a practical matter, and as SpaceX previously demonstrated, the MSS "feeder link" traffic and general FSS traffic will be largely indistinguishable and transmit through the same earth station equipment, causing no additional interference risk for other users than if the traffic was used solely for MSS feeder links. Moreover, permitting SpaceX to use the 29.1-29.5 GHz band for uplink traffic will permit more efficient network planning and resource allocation than if that spectrum were limited solely to feeder links for MSS use cases. Indeed, as with its operations across all bands, SpaceX

²² *Id.*

²³ See *Gen2 Upgrade Order*, Grant Conditions 3(d)-(e) & ¶ 12.

²⁴ See *id.*; *SpaceX Gen2 Upgrade Amendment*, Waiver Requests at 8-10.

²⁵ *Id.*, Grant Conditions 3(d)-(e), 10 & ¶ 12

²⁶ *Id.*, Grant Conditions 3(d)-(e); ¶ 12; *SpaceX Gen2 Upgrade Amendment*, Waiver Requests at 10-11.

²⁷ See *id.*

²⁸ 47 C.F.R. § 2.106(d)(535).

²⁹ See *Gen2 Upgrade Order*, Grant Conditions 3(d)-(e) & ¶ 12.

ensures state-of-the-art frequency reuse through the use of its narrow and independently steerable beams allowing for efficient spectrum sharing with current users. SpaceX will operate in this band consistent with its waiver request and the associated operations and conditions granted in the *Gen2 Upgrade Order*.³⁰

V-band

51.4-52.4 GHz. In the *Gen2 Upgrade Order*, the Commission granted SpaceX's waiver request to permit FSS uplink transmissions in the 51.4-52.4 GHz band.³¹ SpaceX incorporates by reference that waiver request and the Commission's rationale for granting it herein.³² SpaceX seeks a conforming waiver of the Table of Frequency Allocations to permit earth station FSS uplink operations in the band, which supports the public interest by making available an additional 1 gigahertz of spectrum—for a total of 2 gigahertz of contiguous uplink spectrum—that will enable SpaceX to connect more individual, enterprise, industrial, and government users, including first responders, to higher-quality broadband service without causing harmful interference to any other users.

As SpaceX demonstrated previously, circumstances have changed considerably since the Commission declined to process SpaceX's request to use the 51.4-52.4 GHz band in 2018, on the grounds that the band lacked domestic or international allocations for FSS.³³ As an initial matter, the Commission revised its rules to permit parties to apply to use frequencies in a way that does not conform to the International Table of Frequency Allocations, finding that such applications could be acceptable for filing and benefit the public interest.³⁴ The ITU has allocated the band to GSO FSS uplink operations, issued several reports demonstrating both the need for FSS access in the 51.4-52.4 GHz band and the compatibility of FSS operations in the band with other users,³⁵ and called for further studies on operations in the band in advance of WRC-27.³⁶ Additionally, the Commission authorized FSS uplink operations in this band in the *Gen2 Upgrade Order*.³⁷

While the band currently lacks an allocation for NGSO FSS operations, the Commission initiated a rulemaking proceeding that proposes to adopt a domestic allocation for NGSO FSS operations in the 51.4-52.4 GHz band³⁸ and granted requests from multiple operators to use the

³⁰ See *id.*, Grant Conditions 3(d)-(e), 11 & ¶ 12.

³¹ See *id.*, Grant Condition 5(a) & ¶ 9.

³² See *id.*; *SpaceX Gen2 Upgrade Amendment*, Waiver Requests at 12-13.

³³ See *Space Exploration Holdings, LLC*, Memorandum Opinion, Order and Authorization, 33 FCC Rcd 11434, ¶ 1, n.2 (2018).

³⁴ See *Satellite Processing Order*, ¶ 26.

³⁵ See, e.g., Report ITU-R S.2461-0, *Spectrum needs for the fixed-satellite service in the 51.4-52.4 GHz band* (July 2019), https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-S.2461-2019-PDF-E.pdf; Report ITU-R S.2463-0, *Sharing with incumbent services in the 51.4-52.4 GHz band and adjacent and nearby bands* (July 2019), https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-S.2463-2019-PDF-E.pdf.

³⁶ See ITU Radio Regs., Res. 130 (WRC-23).

³⁷ See *Gen2 Upgrade Order*, Grant Condition 5(a).

³⁸ See *Satellite Spectrum Abundance*, SB Docket No. 25-180, Notice of Proposed Rulemaking, 40 FCC Rcd 3794, ¶¶ 57-59 (2025) ("*Spectrum Abundance NPRM*").

band for such operations.³⁹ The record in that proceeding explains at length the significant consumer benefits of enabling NGSO systems to use the 51.4-52.4 GHz band and how NGSO FSS operators can readily share the band with other spectrum users. Moreover, as with its other requests for additional uplink spectrum, granting SpaceX's waiver request will advance the Commission's broadband policy by enabling its earth station system to deliver more symmetrical, fiber-like speeds, including to consumers and enterprise, industrial, and government end users requiring dedicated capacity.

In any event, until such time that the Commission establishes an NGSO FSS allocation for the 51.4-52.4 GHz band, SpaceX will operate in the band on an unprotected, non-interference basis with respect to co-primary users in the band, consistent with the operations authorized in the *Gen2 Upgrade Order*.⁴⁰

W-band

In the *Gen2 Upgrade Order*, the Commission granted SpaceX's waiver request to permit FSS uplink transmissions in the 92.0-94.0, 94.1-95.0, 95.0-100.0, 102.0-105.0, 105.0-109.5, and 111.8-114.25 GHz bands.⁴¹ SpaceX incorporates by reference that waiver request and the Commission's rationale for granting it herein.⁴² SpaceX seeks a conforming waiver of the Table of Frequency Allocations to permit earth station FSS uplink operations in the requested W-band frequencies. Granting a waiver will support the public interest by leveraging ever-more efficient, high-capacity spectrum bands, particularly for backhaul use cases, to deliver high-speed, low-latency broadband to consumers.

While the bands currently lack an identification for FSS operations, the Commission initiated a rulemaking proceeding that proposes to adopt a domestic allocation for NGSO FSS operations in these W-band frequencies.⁴³ The record in that proceeding explains at length the significant consumer benefits of enabling NGSO systems to use these W-band frequencies and explains how NGSO FSS operators can readily share the band with other spectrum users, such as by leveraging obstructions in the built and natural environment, adopting simple physical and angular separation, and coordinating to avoid in-line events. Moreover, as with its other requests for additional uplink spectrum, granting SpaceX's waiver request will advance the Commission's broadband policy by enabling these earth stations to deliver better broadband to more consumers and enterprise, industry, and government end users, including those requiring dedicated capacity.

Consistent with its waiver request and the associated operations and conditions granted in the *Gen2 Upgrade Order*, SpaceX will operate in these bands on an unprotected, non-interference basis,⁴⁴ leveraging its success operating earth stations in the 81.0-86.0 GHz band while protecting

³⁹ See, e.g., *Gen2 Upgrade Order*, Grant Condition 5(a); *Kuiper Systems LLC*, ICFS File Nos. SAT-LOA-20211104-00145, SAT-AMD-20250311-00068, Order and Authorization, Grant Condition 3 (Feb. 10, 2026) ("*Kuiper Order*").

⁴⁰ See *Gen2 Upgrade Order*, Grant Conditions 5(a), 10 & ¶ 9.

⁴¹ *Id.*, Grant Condition 7 & ¶¶ 9, 11.

⁴² See *id.*; *SpaceX Gen2 Upgrade Amendment*, Waiver Requests at 13-16.

⁴³ See *Spectrum Abundance NPRM*, ¶¶ 60-63.

⁴⁴ See *Gen2 Upgrade Order*, Grant Conditions 7, 9-10, 12 & ¶¶ 9, 11; *SpaceX Gen2 Upgrade Amendment*, Waiver Requests at 13-16.

non-federal and federal users from harmful interference. Like SpaceX's earth station uplink operations in the 81.0-86.0 GHz band, its operations in the W-band will feature high-gain, narrow beams that can coexist with terrestrial fixed and mobile deployments in close proximity with little to no risk of harmful interference. SpaceX will coordinate with incumbent, primary users, federal users, and passive services and take all practicable steps to protect those users and services from harmful interference in accordance with its waiver request and the associated coordination conditions specified in the *Gen2 Upgrade Order*.⁴⁵ SpaceX will register this gateway earth station site in the 70/80/90 GHz band database through a third-party link registration service to facilitate efficient coordination and coexistence with future users of these bands.

Waiver of Sections 25.115(f)(1) & 25.146(a)(2).

The Commission granted SpaceX a waiver for its Gen1 and Gen2 system to exceed applicable equivalent power flux-density ("EPFD") limits for Ka-band downlinks within the territories of the United States.⁴⁶ SpaceX incorporates by reference those waiver requests and the Commission's rationale for granting them herein.⁴⁷ To the extent necessary, SpaceX seeks a conforming waiver of Sections 25.115(f)(1) and 25.146(a)(2) for its quad-band gateway downlink operations within the territories of the United States, and the limits in Article 22 and Resolution 76 of the ITU Radio Regulations, to the extent SpaceX's proposed downlink operations exceed those limits. Granting a conforming waiver will allow SpaceX to support its FSS operations in the manner the Commission intended in granting its waiver request in the *Gen2 Upgrade Order*.⁴⁸

Under Section 25.115(f)(1), an NGSO FSS earth station applicant seeking authority to operate in the 10.7-30.0 GHz band must certify compliance with Section 25.146(a)(2).⁴⁹ Section 25.146(a)(2) requires an NGSO FSS applicant to certify that it will comply with any applicable EPFD limits in Article 22 and Resolution 76 of the ITU Radio Regulations, except that for operations in the 17.3-17.8 GHz band, with the ITU equivalent power flux-density limits applicable to NGSO FSS system operations in the 17.8-18.4 GHz band.⁵⁰ To the extent applicable, SpaceX intends to comply with the requirements to meet EPFD in uplink globally.

Yet, the United States has already demonstrated its support for revising EPFD rules at the ITU to ensure the protection of GSO networks while maximizing efficient use of spectrum shared with NGSO systems. Indeed, the Commission has recognized that the Article 22 EPFD limits are outdated and inefficient, harming consumers, competition, and coordination. As the Commission has stated, "the ability to operate and provide services from today's operational and planned non-GSO systems are significantly penalized when subjected to the [EPFD] limits based on the designs

⁴⁵ See *id.*

⁴⁶ See *Gen2 Upgrade Order*, Grant Condition 4 & ¶¶ 16-19; *Gen1 Upgrade Grant*, Grant Condition 3.

⁴⁷ See *id.*; see also *SpaceX Gen2 Upgrade Amendment*, Waiver Requests at 16-19.

⁴⁸ See *Gen2 Upgrade Order*, Grant Condition 4 & ¶¶ 16-19.

⁴⁹ 47 C.F.R. § 25.115(f)(1).

⁵⁰ 47 C.F.R. § 25.146(a)(2).

from the time period from before 2000.”⁵¹ The ITU’s Radio Regulations do not require American consumers and the NGSO satellite operators seeking to serve them to wait for the international process to play out to realize the benefits of a modernized GSO-NGSO sharing framework. To the contrary, those international rules specifically provide that the EPFD limits “may be exceeded on the territory of any country whose administration has so agreed,”⁵² reflecting the established principle that the United States remains sovereign over domestic use of radio frequencies.⁵³

Since then, the Commission has granted SpaceX’s waiver requests for its Gen1 and Gen2 systems to exceed applicable EPFD limits for Ka-band downlinks within the territories of the United States.⁵⁴ The Commission granted Amazon a similar waiver for its NGSO system.⁵⁵ And now, the Commission is poised to vote on a Draft Report and Order that would replace these outdated EPFD limitations for Ka-band operations with a modern framework that gives NGSO and GSO operators the flexibility to reach protection criteria through good-faith coordination.⁵⁶

Consistent with the Draft Report and Order, SpaceX’s Gen1 and Gen2 waiver requests, and the Commission’s rationale for granting them, to the extent necessary, SpaceX seeks a conforming waiver of Sections 25.115(f)(1) and 25.146(a)(2) for its quad-band gateway downlink operations within the territories of the United States, and the limits in Article 22 and Resolution 76 of the ITU Radio Regulations, to the extent SpaceX’s proposed downlink operations exceed those limits. Moreover, as SpaceX demonstrates in the technical information accompanying its application, operations at the proposed levels will not cause unacceptable interference to geostationary satellites authorized to operate in the relevant frequency bands.

Consistent with the operations and conditions granted in the *Gen2 Upgrade Order*, SpaceX will operate in these bands on an unprotected, non-interference basis.⁵⁷ SpaceX will conduct its earth station downlink operations under this waiver in accordance with the same conditions specified in the *Gen2 Upgrade Order*.⁵⁸ SpaceX will ensure that GSO operators are protected.⁵⁹ To the extent applicable, SpaceX intends to comply with the requirements to meet EPFD in downlink outside the United States, except to the extent another country has adopted different operational limits in the exercise of that country’s sovereignty.

⁵¹ United States of America, *Working Document Towards a Preliminary Draft New Report [Article 22 EPFD Limit Studies]*, Document 4A/84-E, at 4 (Apr. 19, 2024).

⁵² ITU Radio Regs. § 22.5CA.

⁵³ See, e.g., Constitution of the International Telecommunication Union, Preamble (“[F]ully recognizing the sovereign right of each State to regulate its telecommunication.”).

⁵⁴ *Gen2 Upgrade Order*, Grant Condition 4 & ¶¶ 16-19; *Gen1 Upgrade Grant*, Grant Condition 3.

⁵⁵ *Kuiper Order*, Grant Condition 4.

⁵⁶ See *Modernizing Spectrum Sharing for Satellite Broadband*, SB Docket No. 25-157, Public Draft, Report & Order, FCC-CIRC2604-01, ¶¶ 1-3, 10-14 (Apr. 9, 2026).

⁵⁷ See *Gen2 Upgrade Order*, Grant Condition 4 & ¶¶ 16-19.

⁵⁸ See *id.*

⁵⁹ See *id.*

Grant of This Application Will Serve the Public Interest.

Granting this application will promote the public interest by improving the coverage, quality, reliability, and sustainability of SpaceX's upgraded Gen1 and Gen2 systems for American consumers without causing significant interference problems for other NGSO systems or unacceptable interference for terrestrial systems. U.S. and worldwide demand for broadband services and Internet connectivity continues to increase with escalating requirements for speed, capacity, and reliability and ongoing adaptations for usage. But as the Commission has recognized, many communities across the U.S. and the world still lack access to reliable broadband connectivity, preventing them from fully participating in economic, social, and civic activities. To help close this digital divide, SpaceX is designing, constructing, and deploying next-generation satellite and earth station systems capable of delivering robust broadband service and ubiquitous mobile connectivity to consumers throughout the country and around the world. SpaceX already secured U.S. authority for its Gen1 and Gen2 systems to operate using the requested frequencies.⁶⁰ This application takes the next step by seeking authority for one of SpaceX's next-generation quad-band gateway earth stations that will connect these satellite systems to the terrestrial Internet.

In the *Gen2 Upgrade Order*, the Commission determined that authorizing SpaceX's requested operations in the Ka-, V-, E-, and W-band frequencies will benefit consumers by expanding the capacity of its system.⁶¹ Likewise, granting this application will serve the public interest by upgrading SpaceX's gateway earth station network consistent with its upgraded Gen1 and Gen2 satellite systems. In doing so, SpaceX's earth stations can make efficient use of higher, lightly used frequency bands to provide high-capacity quad-band backhaul, greater operational versatility, and enhanced coverage. This will directly promote the public interest by accelerating SpaceX's ongoing efforts to deliver additional capacity, faster broadband speeds, and ubiquitous mobile connectivity to customers everywhere, particularly in unserved and underserved areas of the United States and around the world. Indeed, expeditiously aligning SpaceX's earth station operations with the associated space station authorizations will ensure that consumers receive the full benefit of the upgraded Gen1 and Gen2 systems as soon as possible. Accordingly, expeditiously granting this application will serve the public interest.

⁶⁰ See generally *Gen2 Upgrade Order*; *Gen1 Upgrade Grant*.

⁶¹ See *Gen2 Upgrade Order*, ¶¶ 1-2, 14.