

(v) A placement that complies with the order of preference for foster care or pre-adoptive placements established by an Indian child's Tribe.

(6) *Foster care and pre-adoptive placement preferences under ICWA.* Indicate which foster care or pre-adoptive placements, reported in paragraph (e)(1) of this section, meet the placement preferences of ICWA in 25 U.S.C. 1915(b) and (c) by indicating with whom the Indian child is placed. Indicate "a member of the Indian child's extended family," "a foster home licensed, approved, or specified by the Indian child's Tribe," "an Indian foster home licensed or approved by an authorized non-Indian licensing authority," "an institution for children approved by an Indian Tribe or operated by an Indian organization which has a program suitable to meet the Indian child's needs," "a placement that complies with the order of preference for foster care or pre-adoptive placements established by an Indian child's Tribe" or "placement does not meet ICWA placement preferences." If the state IV-E agency indicated "placement does not meet ICWA placement preferences," then the state IV-E agency must complete paragraph (i)(7) of this section. Otherwise, the state title IV-E agency must leave paragraph (i)(7) of this section blank.

(7) *Good cause under ICWA, foster care.* Indicate whether the court determined by clear and convincing evidence, on the record or in writing, a good cause to depart from the ICWA placement preferences in accordance with 25 U.S.C. 1915(b) or to depart from the placement preferences of the Indian child's Tribe in accordance with 25 U.S.C. 1915(c). Indicate "yes" or "no." If the state title IV-E agency indicated "yes," then the state title IV-E agency must indicate the basis for good cause in paragraph (i)(8) of this section. If the state title IV-E agency indicated "no," then the state title IV-E agency must leave paragraph (i)(8) of this section blank.

(8) *Basis for good cause, foster care.* If the state title IV-E agency indicated "yes" to paragraph (i)(7) of this section, indicate the state court's basis for determining good cause to depart from ICWA placement preferences by indicating "yes" or "no" in each paragraph (i)(8)(i) through (v) of this section:

(i) Request of one or both of the Indian child's parents.

(ii) Request of the Indian child.

(iii) The unavailability of a suitable placement after a determination by the court that a diligent search was conducted to find suitable placements

meeting the placement preferences in ICWA at 25 U.S.C. 1915 but none has been located.

(iv) The extraordinary physical, mental, or emotional needs of the Indian child, such as specialized treatment services that may be unavailable in the community where families who meet the placement preferences live.

(v) The presence of a sibling attachment that can be maintained only through a particular placement.

(9) *Active efforts.* Indicate whether the state title IV-E agency made active efforts to prevent the breakup of the Indian family in accordance with 25 U.S.C. 1912(d) and 25 CFR 23.2. Indicate "yes" or "no."

(10) *Available ICWA adoptive placements.* If the state title IV-E agency indicated the child exited to adoption in paragraph (g)(3) of this section, indicate which adoptive placements that meet the placement preferences in ICWA at 25 U.S.C. 1915(a) and (c) were willing to accept placement. Indicate in each paragraph (i)(10)(i) through (iv) of this section "yes," "no," or "not applicable." If the Indian child's Tribe established a different order of preference by resolution in accordance with 25 U.S.C. 1915(c), the state title IV-E agency must complete paragraph (i)(10)(iv) of this section and leave paragraph (i)(10)(i) through (iii) of this section blank.

(i) A member of the Indian child's extended family.

(ii) Other members of the Indian child's Tribe.

(iii) Other Indian families.

(iv) A placement that complies with the order of preference placements established by an Indian child's Tribe.

(11) *Adoption placement preferences under ICWA.* If the state title IV-E agency indicated the child exited to adoption in paragraph (g)(3) of this section, indicate whether the adoptive placement meets the adoptive placement preferences of ICWA in 25 U.S.C. 1915(a) and (c) by indicating with whom the Indian child is placed. Indicate "a member of the Indian child's extended family," "other members of the Indian child's Tribe," "other Indian families," "a placement that complies with the order of preference for adoptive placements established by an Indian child's Tribe," or "placement does not meet ICWA placement preferences." If the state IV-E agency indicated "placement does not meet ICWA placement preferences," then the state IV-E agency must complete paragraph (i)(12) of this section; otherwise, leave paragraph (i)(12) of this section blank.

(12) *Good cause under ICWA, adoption.* If the state title IV-E agency

indicated "placement does not meet ICWA placement preferences" in paragraph (i)(11) of this section, indicate whether the court determined by clear and convincing evidence, on the record or in writing, a good cause to depart from the ICWA adoptive placement preferences under 25 U.S.C. 1915(a) or to depart from the adoptive placement preferences of the Indian child's Tribe under 25 U.S.C. 1915(c). Indicate "yes" or "no." If the state title IV-E agency indicated "yes," then the state title IV-E agency must indicate the basis for good cause in paragraph (i)(13) of this section. If the state title IV-E agency indicated "no," then the state title IV-E agency must leave paragraph (i)(13) of this section blank.

(13) *Basis for good cause, adoption.* If the state title IV-E agency indicated "yes" in paragraph (i)(16), indicate the state court's basis for determining good cause to depart from ICWA adoptive placement preferences by indicating "yes" or "no" in each paragraph (i)(13)(i) through (v) of this section.

(i) Request of one or both of the child's parents.

(ii) Request of the Indian child.

(iii) The unavailability of a suitable placement after a determination by the court that a diligent search was conducted to find suitable placements meeting the adoptive placement preferences in ICWA at 25 U.S.C. 1915 but none has been located.

(iv) The extraordinary physical, mental, or emotional needs of the Indian child, such as specialized treatment services that may be unavailable in the community where families who meet the adoptive placement preferences live.

(v) The presence of a sibling attachment that can be maintained only through a particular adoptive placement.

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 2 and 25

[IB Docket No. 22-273; FCC 24-97; FR ID 260367]

NGSO Fixed-Satellite Service (Space-to-Earth) Operations in the 17.3-17.8 GHz Band

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Federal Communications Commission (FCC or Commission) adopts rules to permit use

of the 17.3–17.7 GHz band by non-geostationary satellite orbit (NGSO) space stations operating in the fixed-satellite service (FSS) in the space-to-Earth (downlink) direction. The *Report and Order* modifies the United States Table of Frequency Allocations (U.S. Table) to enable NGSO FSS to operate in the 17.3–17.8 GHz band in the downlink direction on a co-primary basis with incumbent services and on a shared, co-primary basis with geostationary satellite orbit (GSO) services. The *Report and Order* also enables NGSO FSS downlink use of the 17.7–17.8 GHz band on a co-primary basis with GSO services and on an unprotected basis with respect to terrestrial fixed services. The Commission additionally adopts technical requirements to establish safeguards to reduce the likelihood of harmful interference to incumbent operators. The actions taken in the Commission's *Report and Order* promote spectrum efficiency, foster competition and U.S. leadership, and expand the ability of satellite operators to deploy advanced services, including high-speed internet access to unserved and underserved areas.

DATES: Effective on January 6, 2025. The incorporation by reference of certain material listed in this rule was approved by the Director of the Federal Register as of May 31, 2018.

FOR FURTHER INFORMATION CONTACT: For additional information on this proceeding, contact Carolyn Mahoney of the Space Bureau Satellite Programs and Policy Division, Space Bureau, at (202) 418–7168 or carolyn.mahoney@fcc.gov.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Report and Order*, in IB Docket No. 22–273, FCC 24–70, adopted on September 26, 2024, and released on September 27, 2024. The full text of this document is available at <https://www.fcc.gov/document/fcc-unlocks-spectrum-support-advanced-satellite-services-0>.

Final Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980, as amended (RFA), requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.” The Commission has prepared an Final Regulatory Flexibility Analysis (FRFA) concerning the potential impact of the rule changes in the *Report and Order*. The FRFA is set forth in the appendix of the FCC Document <https://>

www.fcc.gov/document/fcc-changes-certain-space-station-regulatory-fees-fy-2024 and a summary is included in the Procedural Matters section below.

Final Paperwork Reduction Act Analysis

The *Report and Order* does not contain new or modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104–13. In addition, the Commission notes that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107–198, *see* 44 U.S.C. 3506(c)(4), the Commission previously sought specific comment on how the Commission might further reduce the information collection burdens for small business concerns with fewer than 25 employees. In the *Report and Order*, the Commission assessed the effects of its adoption of rules implementing the Part 25 licensing and operating provisions and technical requirements. The Commission finds that such requirements are unlikely to directly impact businesses with fewer than 25 employees.

Congressional Review Act

The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, Office of Management and Budget, concurs that this rule is non-major under the Congressional Review Act, 5 U.S.C. 804(2). The Commission will send a copy of the *Report and Order* to Congress and the Government Accountability Office, pursuant to 5 U.S.C. 801(a)(1)(A).

Synopsis

I. Introduction

In the *Report and Order*, the Commission adopts rule changes to permit use of the 17.3–17.8 GHz band by NGSO operators in the FSS in the downlink direction. This action provides a contiguous 1300 MHz of spectrum for NGSO FSS downlink operations, allowing for technologically innovating and enhanced satellite services to the benefit of American consumers. The allocations in the *Report and Order* align the U.S. Table with the International Table of Allocations to provide a more cohesive global framework for FSS operators and maximize the efficient use of the 17 GHz band spectrum.

The *Report and Order* specifically permits use of the 17.3–17.7 GHz band for NGSO FSS downlink operations on a co-primary basis with other primary incumbent services operating in the band and on a shared, co-primary basis with GSO space stations. The

Commission also permits NGSO FSS downlink use of the 17.7–17.8 GHz band on a co-primary basis with GSO FSS operations and on an unprotected basis with respect to terrestrial fixed services. The Commission accordingly amends the United States Table of Frequency Allocations and 47 CFR part 2 and modifies 47 CFR part 25 to authorize NGSO FSS operations in the 17 GHz band.

In permitting use of the 17 GHz band for NGSO FSS operators, the *Report and Order* adopts technical rules to facilitate operations between NGSO FSS downlink services and incumbent providers operating in the 17.3–17.8 GHz band. The technical measures adopted in the *Report and Order* also create a more consistent regulatory framework in the 17 GHz band. Specifically, the Commission requires that NGSO FSS operators comply with the power limits established by the International Telecommunications Union (ITU) applicable to Region 2. The *Report and Order* adopts the ITU equivalent power flux density (EPFD) limits applicable in the 17.3–17.8 GHz band and power flux density limits (PFD) limits applicable in the 17.7–17.8 GHz band, and further extends both sets of power limits to the entire 17.3–17.8 GHz band to protect incumbent operators.

The *Report and Order* additionally extends the authorization of individual and blanket-licensed earth stations in the 17.3–17.8 GHz band to include NGSO FSS earth stations. Blanket licenses in the 17.7–17.8 GHz bands will be authorized for operation on an unprotected basis with respect to current and future systems operating in the fixed service. The *Report and Order* also revises the Commission's rules to include the 17.3–17.7 GHz and 17.7–17.8 GHz bands in list of frequencies available for use by Earth Stations in Motion (ESIMs) communicating with NGSO FSS space stations.

The following standards appear in the amendatory text of this document and were previously approved for the locations in which they appear: 2016 ITU Radio Regulations, Article 21, Section V and Article 22, Section II.

II. Background

The Table of Frequency Allocations is comprised of the International Table of the ITU Radio Regulations (International Table) and the U.S. Table. In Region 2 of the International Table, the 17.3–17.7 GHz band is allocated to FSS operations (in both uplink (Earth-to-space) and downlink (space-to-Earth) directions and to the broadcasting-satellite service (BSS) on a co-primary basis, as well as

to the radiolocation service on a secondary basis. The adjacent 17.7–17.8 GHz band is allocated internationally in ITU Region 2 to the terrestrial fixed service, BSS, and FSS (in both uplink and downlink directions) on a primary basis and to the mobile service on a secondary basis. Prior to the changes adopted in the *Report and Order*, in the U.S. Table, the 17.3–17.7 GHz band was allocated to the FSS and BSS on a co-primary basis and to the radiolocation services on a secondary basis. Use of the 17.3–17.8 GHz band by BSS and FSS downlink was limited to GSO FSS systems in the U.S. Table. The 17.7–17.8 GHz band was allocated to terrestrial fixed service and FSS (uplink and downlink) on a co-primary basis in the U.S. Table.

The 17.3–17.8 GHz band was historically used for FSS feeder uplinks that transmit programming to Direct Broadcast Satellite (DBS) service GSO space stations, in addition to terrestrial fixed service use of the 17.7–17.8 GHz band. DBS feeder link operations typically involve the use of large, high-gain antennas at a limited number of individually-licensed earth station locations. The DBS service satellites then downlink that video programming directly to consumers in the 12.2–12.7 GHz band. BSS, used as the “17/24 GHz BSS,” provides service downlinks to consumers in the 17.3–17.8 GHz band and is also used for feeder uplinks to DBS space stations, *i.e.*, reverse band operations. The Commission has previously adopted rules to avoid interference between DBS and 17/24 GHz BSS operations, both in-orbit (“space path” interference) and on the ground (“ground path” interference).

On August 3, 2022, the Commission adopted a Report and Order (87 FR 72388, November 25, 2022) (*17 GHz GSO Order*) to permit use of the 17.3–17.8 GHz band by GSO FSS downlink space stations. In the *17 GHz GSO Order*, the Commission permitted FSS downlinks from GSOs to operate in the 17.3–17.7 GHz band on a co-primary basis with other primary services in that band. In addition, the Commission made certain other changes to the U.S. Table to permit GSO FSS downlink operations in the adjacent 17.7–17.8 GHz band and revised the existing primary FSS allocation in the U.S. Table to permit GSO FSS space-to-Earth operations. The *17 GHz GSO Order* authorized individually-licensed FSS receiving earth stations to receive FSS emissions from GSOs in the 17.3–17.8 GHz band, subject to coordination methodologies, and to receive FSS emissions from GSOs in the 17.7–17.8 GHz band on an unprotected basis with

respect to fixed service operations. The Commission further authorized blanket-licensed receiving FSS earth stations and ESIMs in the 17.3–17.8 GHz band on an unprotected basis. The *17 GHz GSO Order* adopted a number of technical rules to both allow for FSS flexibility in the band and prevent harmful interference between GSO FSS downlinks and incumbent operators.

The Commission adopted a Notice of Proposed Rulemaking (87 FR 64750, October 26, 2022) (*17 GHz NGSO Notice*) along with the *17 GHz GSO Order*. The *17 GHz NGSO Notice* sought comment on proposals raised in response to the Commission’s Notice of Proposed Rulemaking (86 FR 7660, February 1, 2021) (*17 GHz FSS Notice*), released in August 2020, to permit NGSO FSS downlink operations in both the 17.3–17.7 GHz and 17.7–17.8 GHz bands, similar to the actions taken with regard to GSO FSS operations in the *17 GHz GSO Order*.

The *17 GHz NGSO Notice* asked for input on specific NGSO FSS spectrum needs to permit NGSO FSS downlink operations in the band and asked commenters to provide supporting technical data and studies to determine whether such an allocation would benefit the public interest while continuing to protect incumbent users. The Commission asked what technical rules would be necessary considering DBS/BSS, GSO FSS, or terrestrial fixed services operations and what rules would need to be adopted or modified to enable effective sharing while protecting these incumbent users in the band. In particular, the Commission asked whether the EPFD limits in the adjacent bands are sufficient to protect DBS/BSS and GSO FSS stations and if there are methods of protection other than EPFD limits that would be applicable. Further, the Commission asked whether the addition of an NGSO allocation would further degrade the reference situation for the DBS stations operating in accordance with the ITU Radio Regulations Appendix 30 plan, and sought input on any domestic or international coordination issues or other technical challenges that should be addressed in coordination.

The *17 GHz NGSO Notice* discussed that, after the release of the prior *17 GHz GSO FSS Notice*, sharing and compatibility studies were underway to analyze use of the 17 GHz band in preparation for World Radiocommunication Conference 2023 (WRC–23), specifically addressing certain sharing issues and the potential for use of the 17.3–17.7 GHz band by NGSO FSS downlink satellites, along with ESIM operations in the 17.7–18.6

GHz and other bands. Among the decisions adopted for consideration at WRC–23 was Agenda Item 1.19, which contemplated an FSS downlink allocation in the 17 GHz band for both GSO and NGSO in Region 2. The ITU Radio Regulations had previously included an FSS allocation in the 17.7–17.8 GHz band in Region 2, but Agenda Item 1.19 for WRC–23 outlined a new primary allocation to the FSS downlink in the 17.3–17.7 GHz band.

WRC–23 modified the ITU Radio Regulations and added an FSS allocation in 17.3–17.7 GHz FSS downlink for both GSO and NGSO operations in Region 2. WRC–23 extended the Article 22 technical limitations of the ITU Radio Regulations to the 17.3–17.7 GHz band, which requires that NGSO FSS systems operating in accordance with ITU Radio Regulations shall neither cause unacceptable interference to nor claim protection from GSO systems in the FSS and BSS. WRC–23 also adopted modifications to Resolution 85 (REV.WRC–23), revising the application of Article 22 and compliance procedures for its corresponding EPFD limits. In order to receive a “qualified favorable” finding of compliance from the ITU, which is required for NGSO FSS operation under the Commission’s rules, NGSO FSS systems must submit a commitment of compliance along with calculations and technical descriptions of the system’s Article 22 EPFD compliance using EPFD validation software. The revisions to the International Table and Articles 21 and Article 22 of the Radio Regulations will become effective January 1, 2025.

Comments in response to the *17 GHz NGSO Notice* were due on December 27, 2022, and reply comments were due on January 24, 2023. The Commission received seven comments and six reply comments. GSO FSS providers, NGSO FSS providers, and terrestrial fixed service organizations filed comments and reply comments. The Commission also received thirteen *ex parte* filings from commenters, several of which were received after the close of WRC–23, with parties calling attention to the adopted resolutions for the 17 GHz band. Notably, parties filing post-WRC–23 *ex partes* agree that the actions taken by WRC–23 provide a foundation for Commission action to facilitate domestic NGSO FSS operations in the 17 GHz and, in fact, resolve specific concerns raised in the earlier comment cycle.

Accordingly, for the reasons discussed in the *Report and Order*, the Commission permits an NGSO FSS downlink allocation in the 17 GHz

band, subject to technical conditions, in furtherance of the Commission's goals of promoting efficient use of the spectrum, competition, and innovation, and providing consumers with access to advanced telecommunications services. In the *Report and Order*, the Commission first addresses the respective allocations for the 17.3–17.7 GHz and 17.7–17.8 GHz bands, followed by the technical components and conditions adopted specific to NGSO FSS downlink operations.

III. Discussion

A. Permitting NGSO FSS Transmissions in the 17.3–17.8 GHz Band

The Ka-band is used by FSS operators to provide satellite-based broadband access services using high-throughput satellites. After review of the record, in the *Report and Order*, the Commission adopts modifications to the U.S. Table and non-Federal government footnotes for NGSO FSS downlink transmission in the 17.3–17.8 GHz band to provide a contiguous 1300 MHz of spectrum for NGSO FSS downlink operations. The Commission permits FSS downlinks from NGSO FSS systems to operate in the 17.3–17.8 GHz band on a co-primary basis with GSO FSS operations and on a co-primary basis with other primary services operating in the band. The Commission also permits NGSO FSS receiving earth stations to operate in the 17.7–17.8 GHz band on an unprotected basis with respect to terrestrial fixed service operations. The Commission modifies § 2.106(d)(58)(i) (non-federal government footnote NG58 of the U.S. Table) by removing the prohibition on NGSO FSS downlink operations in the 17.3–17.8 GHz band. The Commission additionally modifies § 2.106(d)(58)(iv) (non-federal government footnote NG58 of the U.S. Table) to authorize NGSO FSS receiving earth stations in the 17.7–17.8 GHz band, subject to the condition that such receiving earth stations must operate on an unprotected basis with respect to non-federal fixed-service stations operating in the band.

The Commission discusses the 17.3–17.7 GHz band and 17.7–17.8 GHz band separately in the following sections.

1. NGSO FSS Transmissions in the 17.3–17.7 GHz Band

The 17.3–17.7 GHz band is allocated on a co-primary basis in the U.S. Table to FSS uplink operations (limited to feeder links for the BSS (DBS)), FSS downlink operations and BSS (17/24 GHz BSS). The *17 GHz GSO Order* extended use of the band to FSS downlinks, limited to GSO FSS networks, on a co-primary basis with

the incumbent users of the band, feeder links for DBS networks, and “reverse band” use for the downlink portion of 17/24 GHz BSS operations. The Commission concluded that FSS downlink communications are technically similar to DBS/BSS communications, and thus permitting GSO FSS operations in the band was in the public interest to use the band more intensively and efficiently while also providing additional downlink capacity for GSO fixed satellite communications.

In the *17 GHz NGSO Notice*, the Commission sought comment on its proposal to make the 17.3–17.7 GHz band available for NGSO FSS systems downlink, similar to the actions taken with regard to GSO FSS operations in the *17 GHz GSO Order*. The *17 GHz NGSO Notice* further sought technical data and studies from commenters to help determine how an NGSO FSS downlink allocation in the band would facilitate efficient NGSO FSS operations, what technical rules would be needed for DBS/BSS, GSO FSS, and terrestrial services, and whether any EPFD or other limits would be needed to protect existing and incumbent operations.

The record in this proceeding supports allocating the 17.3–17.7 GHz band for NGSO FSS downlink operations. Commenters assert that such an allocation is in the public interest because it would establish a contiguous 1300 MHz of spectrum for NGSO FSS services, resulting in more efficient use of the 17 GHz band, increased competition, and increased quality and availability of satellite broadband services, thus helping to close the digital divide. O3b Limited and SES Americom, Inc., Telesat Canada, and WorldVu Satellites, Ltd. (collectively, “the Satellite Companies”) state that this allocation will serve the public interest by mitigating spectrum constraints and affording consumers greater access to satellite-enabled services. Kuiper agrees and further adds that increasing the availability and quality of satellite broadband services will mitigate the disparate impacts on rural and impoverished communities. Kuiper notes that the *17 GHz GSO Order* addressed “major technical and practical concerns regarding coexistence between FSS downlinks and incumbent communications, many of which are common to NGSO and GSO systems,” and the Commission concluded that the technical rules adopted were sufficient to prevent interference and promote sharing in the band even without a Region 2 allocation for FSS downlinks. Commenters also note that studies prepared in advance of WRC–23

measuring the feasibility of sharing the 17 GHz band with both FSS GSO and NGSO along with existing incumbent services confirm that NGSO FSS operations are fully compatible with other 17 GHz band services and that existing frameworks are in place to support coexistence among these services.

Some commenters raised concerns with the Commission adopting an NGSO FSS allocation in the 17 GHz band prior to any resolutions adopted at WRC–23, arguing that doing so would be premature and instead recommending that “awaiting international adoption is necessary to remain ‘consistent with Commission precedent.’” However, some commenters originally opposed to adopting an FSS allocation acknowledge that, following the adopted WRC–23 Region 2 NGSO FSS downlink allocation in the 17 GHz band, the proposed domestic allocation in the band is in alignment with both international policy and the public interest, but reiterate calls to adopt technical safeguards to protect GSO FSS and BSS operations. Viasat initially argued that NGSO stakeholders’ comments failed to establish an adequate basis for allowing NGSO FSS operations in the 17.3–17.8 GHz band, but pointed to the more stringent protections of GSO networks in Article 22 of the ITU Radio Regulations and advocated that a better approach would be for the Commission to factor the outcomes of WRC–23 into its consideration of appropriate technical limits for the 17.3–17.8 GHz band. Viasat more recently asserts that the outcomes of WRC–23 “provide useful input into the Commission’s own decision-making process with respect to potential NGSO FSS operations in the 17 GHz band,” and that the actions taken at WRC–23 in fact “provide a basis for subsequent action by the Commission to facilitate domestic NGSO FSS operations within the 17 GHz band.”

Satellite operators further support allocating the 17.3–17.7 GHz band to NGSO FSS downlink operations on a co-primary basis. These commenters argue that a co-primary allocation is justified to support technological satellite innovation and swift deployment of commercially viable services while simultaneously helping to mitigate spectrum constraints. GSO operators oppose a co-primary allocation, instead arguing that the Commission should allocate the 17.3–17.7 GHz band on only either a secondary or unprotected basis to protect GSO FSS and BSS operations

and ensure that incumbent GSO operators are not unduly impacted by the addition of NGSO FSS systems in the band. DIRECTV and EchoStar argue that a secondary or unprotected basis, as applicable, is consistent with both ITU Article 22.2 and the Commission's rules requiring NGSO systems to protect GSO systems from interference, and a secondary allocation would ensure that incumbent GSO FSS operations are not unduly impacted or precluded by NGSO systems in the 17 GHz band. NGSO operators, however, assert that GSO FSS systems are presently afforded significant protections under § 25.289 of the Commission's rules and Article 22 of the ITU Radio Regulations, and are also given priority over NGSO FSS in other domestic spectrum band plans, thus bolstering the need for equal status of NGSO and GSO FSS in the 17 GHz band. These commenters argue that a co-primary allocation for downlink spectrum in the 17 GHz would balance the uplink and downlink spectrum available to NGSO FSS systems while encouraging more robust broadband service offering and promoting competition across NGSO, GSO, and terrestrial fixed services to provide more options for connectivity.

The Commission concludes that it would serve the public interest to allocate the 17.3–17.7 GHz band to NGSO FSS downlink operations on a co-primary basis with incumbent services. The Commission finds that NGSO FSS downlinks in the 17 GHz band are compatible with incumbent services, specifically GSO FSS downlinks, feeder links for DBS networks, and “reverse band” use for the downlink portion of 17/24 GHz BSS operations. Further, the Commission finds that the technical measures adopted in the *Report and Order*, in combination with existing Commission and ITU frameworks requiring NGSO FSS protection of GSO systems and coordination, provide sufficient interference protection to GSO FSS systems. The Commission disagrees with concerns that a co-primary allocation for NGSO FSS system will preclude GSO FSS operators from the 17 GHz band. The Commission concludes that a co-primary allocation for NGSO FSS operations will support the most efficient use of the 17 GHz band spectrum by aligning this allocation with adjacent bands while mandating protection of GSO FSS operators with the technical protections within those bands.

In addition to providing greater bandwidth for services to consumers across the country, this allocation will provide increased communications

capability to unserved and underserved areas, help to close the digital divide, and ensure that this valuable spectrum band is used in the most efficient and effective manner. The Commission notes that permitting NGSO FSS downlink services in the 17 GHz band is consistent with the modifications to the International Table and aligning the U.S. Table with the International Table will serve the public interest by providing regulatory certainty and consistency with operations in Region 2. Accordingly, the Commission modifies non-Federal government footnote NG58(i) to permit NGSO FSS downlink operations in the 17.3–17.7 GHz band on a co-primary basis by removing the prohibition on NGSO FSS downlink operations in the 17.3–17.8 GHz band.

2. NGSO FSS Transmissions in the 17.7–17.8 GHz Band

The International Table allocates the 17.7–17.8 GHz band segment in Region 2 to terrestrial fixed service, FSS in both directions and to BSS on a primary basis, and to the mobile service on a secondary basis. In the United States, the band is allocated to the non-federal terrestrial fixed service and to FSS uplink and downlink operations on a primary basis. The Commission added a limitation in footnote NG58 to the U.S. Table in the *17 GHz FSS Order* stating that in the band 17.7–17.8 GHz, earth stations in the fixed-satellite service may be authorized for the reception of GSO FSS emissions, subject to the condition that these earth stations shall not claim protection from transmissions of non-Federal stations in the fixed service that operate in that band.

Commenters supporting NGSO FSS downlink operations in the 17.3–17.7 GHz band generally also support permitting NGSO FSS downlink operations on an unprotected basis vis-à-vis terrestrial fixed services in the 17.7–17.8 GHz band. Terrestrial fixed providers express concerns about extending the sharing of the 17.7–17.8 GHz band to NGSO operations and argue that further technical study is needed to determine whether NGSO operations can operate concurrently with and protect incumbent fixed service operations in the 17.7–17.8 GHz band. AT&T and Verizon argue that the technical studies and data to support an NGSO FSS downlink do not affirmatively prove that NGSO FSS sharing of the 17.7–17.8 GHz band is feasible. However, they propose that should NGSO FSS operations be permitted in the 17.7–17.8 GHz band, the Commission should do so on a secondary and unprotected basis relative to terrestrial fixed service

operations. The terrestrial fixed providers also agree with DIRECTV and EchoStar that NGSO constellations should be required to submit a showing that they can share the 17.7–17.8 GHz band without interference.

The Commission finds that permitting NGSO FSS downlink operations in the 17.7–17.8 GHz band is in the public interest. Earth stations receiving in the 17.7–17.8 GHz band are not entitled to protection from the terrestrial fixed service, and NGSO FSS downlink operations therefore will not disrupt the balance between facilitating FSS operations and protecting incumbent use of the 17.7–17.8 GHz band. This action is consistent with the Commission's decision to permit GSO FSS downlink operations on a co-primary basis. Similar to the actions taken with regard to GSO FSS systems, the Commission permits authorization of earth stations receiving transmissions from NGSO FSS space stations in the 17.7–17.8 GHz band on an unprotected basis vis-à-vis the terrestrial fixed service (both existing and future fixed service operations) and on a shared basis with GSO FSS space stations, discussed in the following section. This is consistent with the Commission's goal to use scarce spectrum resources intensely in an efficient and effective manner. The Commission modifies footnote NG58(iv) of the U.S. Table of Allocations for the reasons discussed previously.

B. Technical Measures To Prevent Harmful Interference in the 17.3–17.8 GHz Band

In the *17 GHz NGSO Notice*, the Commission sought comment on the technical rules needed to protect DBS and BSS, GSO FSS, and terrestrial services should NGSO FSS downlink operations be permitted in the 17 GHz band. The Commission asked whether the current EPPD limits in the adjacent bands are sufficient to protect DBS and BSS stations and GSO FSS stations, or if there are methods of protection other than EPPD limits that would be more effective. The Commission adopts the technical measures and conditions detailed in the *Report and Order* to facilitate operations between NGSO FSS downlink services and incumbent providers and create a more consistent regulatory framework in the 17.3–17.8 GHz band.

1. Measures To Facilitate Space-to-Earth Operations at 17/24 GHz BSS and FSS

In the *17 GHz GSO Order*, the Commission adopted a number of technical rules to prevent harmful interference and facilitate intra-service

operations between 17.3–17.8 GHz FSS space stations and inter-service operations between FSS and 17/24 GHz BSS space stations operating in the downlink direction. The Commission extended a number of requirements that were already applicable to 17/24 GHz BSS space stations transmitting in the band to 17.3–17.8 GHz band GSO FSS space stations, with certain modifications. In the *Report and Order*, the Commission adopts the following modifications to the FSS technical requirements to account for NGSO FSS downlink operations in the 17.3–17.8 GHz band.

Equivalent Power Flux Density Limits. The Commission sought comment in the *17 GHz NGSO Notice* on whether the existing EPFD limits in the adjacent 17.8–18.6 GHz bands are sufficient to protect DBS and BSS stations, GSO FSS stations, and terrestrial fixed services in the 17.3–17.8 GHz band, or if there are alternative methods of protection, other than EPFD limits, that would be better applied in the 17.3–17.8 GHz band.

EPFD limits have been established by the ITU Radio Regulations as a technical mechanism to allow NGSO and GSO systems to operate in a compatible manner. There is broad support in the record that BSS and GSO FSS downlink services can be protected through the use of existing EPFD limits in the adjacent 17.8–18.6 GHz band. The Satellite Companies assert that international studies show that NGSO FSS operations are compatible with other 17 GHz band services and support the Commission extending the downlink EPFD limits outlined in Article 22.2 and in Table 22–1B to the 17.3–17.8 GHz band to protect BSS and GSO FSS downlink operations. Kuiper proposes that the Commission extend the current rules requiring compliance with the applicable EPFD limits to the 17 GHz band and agrees that extending the EPFD downlink limits to the 17.3–17.7 GHz band would ensure that NGSO FSS systems do not cause unacceptable interference to BSS networks. Kuiper states this would result in even lower interference levels to BSS receiving earth stations than under the current rules. SpaceX argues that EPFD limits are not necessary to ensure that NGSO FSS systems can operate without causing interference, but proposes that, if the Commission does employ EPFD limits, it should only extend international limits that apply to protect BSS receive stations. GSO FSS operators agree and support extending the ITU EPFD limits adopted at WRC–23. Viasat recommends that the Commission consider adopting EPFD limits for the 17.3–17.8 GHz band, and supports

extending the Article 22 EPFD limits to the 17 GHz band in alignment with WRC–23, should the Commission permit NGSO FSS operations in the 17 GHz band. DIRECTV and EchoStar also support applying the EPFD limits in the adjacent 17.8–18.6 GHz band to the 17.3–17.7 GHz band, support extending the EPFD limits to the 17.7–17.8 GHz band, and further propose that the Commission should require NGSO FSS operators to certify EPFD compliance for entire constellations, submit technical data and calculations of EPFD compliance for public review, and obtain a finding of EPFD compliance from either the Commission or the ITU prior to commencing operations.

Section 25.146(a)(2) of the Commission's rules already require that NGSO FSS space stations comply with any EPFD levels in Article 22, Section II, and Resolution 76 of the ITU Radio Regulations. Section 25.289 further requires that NGSO systems must not cause unacceptable interference to, or claim protection from, a GSO FSS or GSO BSS network, and that NGSO FSS operators in compliance with the applicable ITU EPFD limits will be considered to have fulfilled its obligation to protect GSO networks from interference. Article 22.2 requires that NGSO systems not cause unacceptable interference to and, unless otherwise specified, shall not claim protection from GSO networks in the FSS and the BSS operating in accordance with the Radio Regulations. WRC–23 modified footnote 5.517 of the International Table to require that, in Region 2, use of the fixed satellite (space-to-Earth) service in the 17.3–17.8 GHz band shall not cause harmful interference to nor claim protection from assignments in the BSS operating in conformity with the Radio Regulations. In tandem with the FSS downlink allocation in the 17 GHz band, WRC–23 revised Table 22–1B of the Radio Regulations to extend the limits to the EPFD downlink radiated by NGSO FSS systems in the 17.3–17.7 GHz band in Region 2. WRC–23 added an additional provision to Table 22.1B to state that operators of NGSO FSS systems providing service in Region 2 must meet the limits of Table 22–1B in the 17.3–17.7 GHz band with respect to GSO systems in the BSS.

The Commission adopts the ITU EPFD limits for the 17.3–17.7 GHz segment of the 17 GHz band and extend these limits to apply to the 17.7–17.8 GHz band to ensure efficient NGSO FSS downlink operations and sufficient technical protections for incumbent operators throughout the entire 17 GHz band. The Commission accordingly modifies § 25.146(a)(2) of the

Commission's rules to state that the ITU EPFD limits that apply to NGSO FSS systems operating in the 17.3–17.7 GHz band shall also apply to NGSO FSS systems operating in the 17.7–17.8 GHz band. The Commission finds that it would serve the public interest to align the domestic EPFD limits with those adopted in the ITU Radio Regulations to provide certainty for NGSO FSS operators while protecting incumbent systems. These limits apply to NGSO operations in Region 2 internationally, and the record in this proceeding supports adoption of the same international EPFD limits domestically. With respect to facilitating NGSO and GSO coordination efforts, the Commission agrees with commenters' assertions that the Commission has frameworks in place for sharing and coordination between NGSO and GSO operators, and the Commission declines to modify such existing frameworks in favor of adopting an additional compliance approval process in this proceeding. As discussed in greater detail in the *Report and Order*, the Commission permits operators to enter into coordination agreements consistent with the Commission's current framework for NGSO and GSO spectrum sharing.

Downlink Power Limits. The Commission has typically applied downlink power flux density (PFD) limits for space stations transmissions to facilitate both inter-service and intra-service sharing. Under the Commission's rules, NGSO FSS systems operating in the 10.7–30.0 GHz bands are required to comply with applicable ITU PFD limits in Article 21 of the Radio Regulations, but NGSO FSS systems have not been authorized for domestic operation in the 17 GHz band. In the *17 GHz GSO Order*, the Commission adopted rules to apply regional PFD limits for GSO FSS space stations in the 17.3–17.7 GHz band to harmonize with the limits applicable to 17/24 GHz BSS systems and to adequately facilitate both inter-service and intra-service sharing. The Commission also clarified that earth stations operating FSS downlinks in the 17.7–17.8 GHz band shall not claim protection from terrestrial fixed service operations in that band, and that the adopted PFD limits will apply vis-à-vis fixed services in the 17.7–17.8 GHz band or adjacent 17.8–18.3 GHz band.

NGSOs assert that taking the same approach to NGSO FSS services is appropriate and supports adopting the ITU PFD limits to protect terrestrial fixed services operating in the 17.7–17.8 GHz segment. The Satellite Companies support relying on the Commission's

existing rules requiring NGSO systems to comply with the applicable Article 21 PFD limits and operate on an unprotected basis with respect to fixed services in the band. Mangata similarly suggests extending the same PFD limits adopted for GSO satellite operations to NGSO FSS systems, rather than limit use of the 17 GHz band, and says that while NGSO systems may need to adjust operations to meet these limits, the PFD limits ensure that terrestrial fixed services will not experience harmful interference at equivalent arrival angles. Kuiper supports applying the PFD limit in the 17.7–17.8 GHz band and argues that the Commission has already resolved concerns about potential interference in the 17.3–17.8 GHz band when it adopted the technical framework for GSO FSS operations in the 17 GHz *GSO Order*, specifically the coordination requirements and PFD limits, which includes an exhaustive record proving that NGSO FSS operations can coexist with other services in the 17 GHz band. Further, Kuiper maintains that NGSO and GSO FSS systems already successfully share the adjacent 17.8–18.3 GHz band with fixed services because of the PFD limits in place. Kuiper explains that, since interference levels would be nearly identical in the 17.7–17.8 GHz band, PFD limits should be adopted for the 17.7–17.8 GHz band as well where utilization by fixed services is even lower than in the adjacent band. SpaceX agrees, and advocates that extending the ITU PFD limits applicable to the 17.7–19.3 GHz band to the 17.3–17.7 GHz band will enable NGSO FSS operators to share the band without causing harmful interference to existing operations while harmonizing the limits for NGSO FSS operations with existing limits for GSO FSS and BSS transmissions. SpaceX further notes that NGSO operators will solely bear any interference impact to fixed operators, not the protected fixed services. GSO operators did not comment on PFD limits in the 17.7–17.8 GHz band.

Kuiper additionally submitted a technical analysis simulating interference from NGSO FSS systems into fixed service systems in the band consistent with methodologies used in ITU Recommendations. Kuiper's dynamic simulations show that the anticipated aggregate interference from combined NGSO FSS systems into fixed services systems is far below the ITU's recommended threshold limits, demonstrating that these systems can coexist with fixed services in the 17.7–17.8 GHz band with little likelihood of interference. Kuiper also cites

operational factors that protect fixed service receivers, which combined with the dynamic interference-to-noise analysis, shows compatibility for fixed and NGSO FSS systems to co-exist in the 17.7–17.8 GHz band without risk of harmful interference from current or future NGSO FSS systems. SpaceX supports Kuiper's study showing that the potential for interference from NGSO operations to fixed services is negligible and that the aggregate emissions of NGSO FSS systems will remain well below the statistical interference-to-noise limits specified by the ITU.

Terrestrial fixed service providers AT&T and Verizon oppose applying the current PFD limits, arguing that these limits are outdated and do not account for the increase of NGSO satellite authorizations in recent years or the differences in NGSO compared to GSO operations. They claim that past records showing no interference to fixed services are not a reliable predictor for future interference and instead recommend that further study is needed before permitting shared NGSO FSS use of the 17.7–17.8 GHz band. AT&T and Verizon also submitted a static analysis (FS Interference Analysis) based on calculations of interference-to-noise ratios to demonstrate the potential for aggregate interference into fixed service antennas from present and future NGSO FSS and GSO FSS operations. These providers argue that the FS Interference Analysis shows that the aggregate interference calculation values could exceed the interference-to-noise thresholds adopted by the ITU and the Commission for protecting terrestrial fixed services in other frequency bands and therefore oppose relying on PFD limits to support an NGSO FSS allocation.

The Commission adopts the ITU PFD limits for NGSO FSS operations in the 17 GHz band, applying to the 17.7–17.8 GHz band and extending to the 17.3–17.7 GHz band, and accordingly modify § 25.146(a)(1) of the Commission's rules. The Commission finds the technical studies and dynamic analyses in favor of adopting the current PFD limits more representative of real-world scenarios in demonstrating that the existing PFD limits will facilitate sharing of the 17.7–17.8 GHz band with minimal risk of interference to fixed service operations. The Commission has previously determined that the PFD limits are effective in protecting terrestrial fixed services from interference, considering that satellite and terrestrial services have long co-existed in these bands using PFD limits without issue. This is consistent with the lack of record

evidence of interference regarding NGSO FSS systems in the adjacent 17.8–18.6 GHz band, and the Commission find no evidence that would support deviating from the established limits in the 17.7–17.8 GHz band. The Commission additionally notes that the Commission has previously determined that the ITU-R PFD limits in these bands are scalable to NGSO FSS systems, which integrate the number of satellites in a constellation, to more effectively protect fixed service operations.

Adopting internationally consistent power limits simplifies compliance for both GSO and NGSO operators, as NGSO FSS space systems are not typically limited to U.S. systems and must meet this ITU PFD limits outside U.S. territory. Further, the Commission agrees that the PFD limits in the 17 GHz band should be consistent with those applicable to the adjacent 17.8–18.3 GHz band and extend the PFD limits applicable in the 17.7–17.8 GHz band to the 17.3–17.7 GHz band to harmonize the limits for NGSO FSS operations with existing limits for GSO FSS and BSS transmissions and bolster protections for incumbent operators across the entire 17 GHz band.

As discussed previously, receiving NGSO FSS downlinks shall not claim protection from existing and future stations in the fixed service operating in the 17.7–17.8 GHz band and NGSO FSS operations must still comply with the PFD levels detailed in Article 21 of the ITU Radio Regulations. The Commission notes that GSO FSS and the fixed service will share the 17.7–18.3 GHz band with NGSO FSS operating on an unprotected basis, and that the rules should be consistent throughout the adjacent bands. The Commission therefore extends the PFD limits to the 17.3–17.7 GHz segment of the 17 GHz band for NGSO FSS systems. Although the NGSO FSS allocation will be co-primary in the 17.3–17.8 GHz band and subject to the adopted PFD limits, earth stations operating in the FSS downlink in the 17.7–17.8 GHz band shall not claim protection from existing and future terrestrial fixed service operations.

2. Measures To Mitigate Space Path Interference From NGSO FSS Downlinks

In the 17 GHz *GSO Order*, the Commission adopted technical requirements applicable to GSO FSS space stations to mitigate space path interference into DBS receivers. In the 17.3–17.8 GHz reverse-band sharing environment, receiving DBS space stations are vulnerable to space path

interference from nearby co-frequency 17/24 GHz BSS space station transmissions. The Commission sought comment in the *17 GHz NGSO Notice* on any rules that may need to be modified to enable effective sharing with NGSO FSS downlink operations and account for any necessary technical requirements should the Commission permit an NGSO FSS downlink allocation in the 17.3–17.8 GHz band.

EPFD(is) Limits. Similar to the previously-discussed EPFD limits, WRC–23 modified Table 22–3 of Article 22 to extend the application of the inter-satellite equivalent power flux density (EPFD(is)) limits from the adjacent 17.8–18.4 GHz band to apply to the 17.3–17.7 GHz band in Regions 1 and 2. WRC–23 additionally added a new footnote, 22.5F.4 to Table 22–3, which details limits to the EPFD(is) radiated by NGSO systems in the FSS in Region 2 in the 17.3–17.7 GHz band, requiring that NGSOs operating at any orbital position in Region 2 meet the EPFD(is) limits for the 17.3–17.7 GHz band with respect to a receiving space station in the BSS feeder link of Appendix 30A in all three Regions.

Several commenters discussed the existing EPFD(is) limits detailed in the ITU Radio Regulations, now applicable to the 17.3–17.7 GHz band in Region 2, as an effective method to further protect all incumbent operators in the band from NGSO FSS downlink interference in the 17.3–17.8 GHz band. Kuiper suggests that sharing between FSS feeder uplinks for DBS service, GSO FSS operations, and NGSO FSS downlink operations can be facilitated by applying the EPFD(is) limits in the adjacent 17.8–18.4 GHz band and by requiring coordination between certain DBS feeder uplink earth stations with individually licensed NGSO FSS receiving earth stations. Kuiper and the Satellite Companies note that NGSO FSS space stations have already been permitted to operate NGSO FSS downlinks in Region 1 in the 17.3–17.8 GHz band under the ITU Radio Regulations and that space path interference has not occurred at regional boundaries. Kuiper suggests that the Commission can incorporate the same proven solutions that have been applied in other frequencies and regions, like EPFD(is) limits, to successfully manage coexistence between NGSO FSS and incumbent operations in the 17.3–17.8 GHz band. Further, commenters note that NGSO FSS downlinks already share spectrum with receiving DBS space stations in the 17.7–18.4 GHz band and, in Region 1, in the 17.3–17.7 GHz band, and that BSS space stations only receive

protection in the 17.8–18.4 GHz band as a result of EPFD(is) limits.

Commenters also agree that the EPFD(is) limits will offer protection to GSO FSS operators, extending beyond protecting DBS feeder links and BSS incumbent services. DIRECTV and EchoStar specifically support extending the EPFD(is) limits in the adjacent band to ensure protection of BSS downlinks and GSO FSS operations, asking the Commission to apply the same EPFD limits applicable to NGSO FSS downlinks and inter-satellite links in the 17 GHz band. Viasat also encouraged the Commission to take action on the 17 GHz band “so long as that action is consistent with the extension by WRC–23 of existing Article 22 EPFD limits to the 17 GHz band.” Kuiper provided technical support to demonstrate the effectiveness of EPFD(is) limits, showing that NGSO FSS operations operating even at the EPFD(is) limit would still be well below the coordination thresholds for DBS feeder links. Kuiper also notes that EPFD(is) limits are based on the received power level at the point of the affected system receiver, making these limits agnostic to specific design and operational parameters, and considering that EPFD(is) limits are designed to apply to EPFD from all space stations in an NGSO FSS system, the ITU is the best body to address space-path interference concerns that may extend across geographic boundaries.

Based on the record, the Commission finds that the ITU EPFD(is) limits applicable to the 17.8–18.3 GHz band are appropriate for operations in the adjacent 17.3–17.8 GHz band to protect incumbent operators in the bands from NGSO FSS downlink interference. The Commission finds that the EPFD(is) limits delineated in Article 22, Table 22–3 of the Radio Regulations will facilitate sharing of the 17 GHz band amongst NGSO FSS downlink operations and incumbent operations while further minimizing the potential for inter-satellite interference caused by NGSO FSS downlinks. The Commission agrees with commenters that the ITU’s established EPFD(is) limits are sufficient to protect DBS space stations and BSS receive stations from potential interference, and will mitigate interference concerns of GSO FSS operators. NGSO FSS operators are required to comply with the ITU EPFD(is) limits in both the 17.3–17.7 GHz and 17.7–17.8 GHz band as reflected in the modification to § 25.146(a)(2) of the Commission’s rules adopted in the *Report and Order*.

Off-axis Power Flux Density Coordination Trigger. In the *17 GHz*

GSO Order, the Commission modified § 25.264(b)(1) and (2) of the rules and extended a PFD trigger of –117 dBW/m²/100 kHz, applicable to BSS space station transmissions, to FSS space station transmissions in the band. DIRECTV and EchoStar ask the Commission to adopt the same PFD coordination trigger as adopted in the *17 GHz GSO Order* to NGSO FSS transmissions in the 17.3–17.8 GHz band to ensure that GSO FSS and BSS operations are protected from NGSO operations, in addition to the previously-discussed EPFD(is) limits. Kuiper disagrees with this proposal, arguing that applying this same coordination trigger to NGSO FSS systems is redundant and not necessary to protect DBS space stations from NGSO FSS operations because the ITU Radio Regulations already require compliance with EPFD(is) limits to protect feeder links to GSO systems, and that further studies demonstrate that EPFD(is) limits are effective at protecting DBS space stations from interference. Kuiper also notes that NGSO FSS stations have already been permitted to operate downlinks in Region 1 in the International Table and the space-to-space interference path does not exist between regions. The Satellite Companies also disagree, arguing that a PFD coordination trigger is not needed to protect DBS feeder links from space-path interference and that their proposed solution for EPFD(is) limits renders a PFD coordination trigger superfluous.

The Commission concludes that the ITU EPFD(is) limits provide a more stringent standard than a PFD coordination trigger to protect DBS space stations from potential interference via NGSO FSS operations. DIRECTV and EchoStar offer no evidence of interference to GSO FSS and BSS stations or technical studies demonstrating the need for a PFD coordination trigger for NGSO FSS operations and thus the Commission does not see a need to deviate from the existing EPFD(is) limits. Accordingly, the Commission declines to adopt a PFD coordination trigger for NGSO FSS systems and clarifies that the ITU EPFD(is) limits adopted for the 17.3–17.7 GHz band under Article 22 of the Radio Regulations will apply to the full 17.3–17.8 GHz band and will be applicable pursuant to § 25.146(a)(2) of the Commission’s rules to protect DBS space stations from potential interference.

Arc Avoidance Angle. DIRECTV and EchoStar, jointly, and Viasat propose that the Commission should establish an effective arc avoidance angle, or an

“exclusion zone,” around the GSO arc from NGSO FSS transmissions. Specifically, DIRECTV and EchoStar propose that the Commission require NGSO FSS satellite transmitters to maintain a minimum of 25 dB reduction from maximum equivalent isotropically radiated power (EIRP) in the direction of the GSO arc, arguing that such an exclusion zone is consistent with ITU Recommendations S. 1528. Viasat proposes that NGSO FSS systems operate with a “suitable avoidance angle with respect to the GSO arc” in the 17.3–17.8 GHz band.

Kuiper disagrees, arguing that DIRECTV and EchoStar do not specify what interference concerns this restriction would potentially address, nor do they provide a technical demonstration that such operational restrictions are necessary to prevent harmful interference. Kuiper and SpaceX argue that existing solutions in the 17 GHz band and adjacent bands render this an arc avoidance angle unnecessary, specifically EPFD(is) limits and EPFD protection for BSS services, and offer technical analysis demonstrating that DBS stations and BSS operators are sufficiently protected from NGSO FSS transmissions under the EPFD(is) limits. Kuiper also notes that DIRECTV and EchoStar’s proposal fails to account for differences in operational parameters between NGSO systems and would result in inconsistent received power levels at the GSO arc depending on these specific parameters. Further, Kuiper argues that DIRECTV and EchoStar’s proposal to allow NGSO FSS applicants to obtain a certification from either the Commission or the ITU of EPFD compliance would be an inefficient use of resources because the ITU will still perform its own analysis to determine compliance and a new compliance framework would unnecessarily delay the deployment of more robust NGSO FSS operations in the 17 GHz band. Either way, Kuiper finds that the ITU is the best body to address any space-path interference concerns, not the Commission.

While arc avoidance angles can be used to address interference, they vary from system to system, and there is not enough technical evidence in the record to support adopting a specific avoidance angle or deviating from the EPFD limits. As the Commission requires in the *Report and Order*, NGSO FSS operators in the 17 GHz band must comply with applicable ITU EPFD limits, which include arc avoidance angles as part of EPFD compliance. Section 25.289 of the Commission’s rules expressly states that if an NGSO FSS licensee is operating in

compliance with applicable ITU EPFD limits, the licensee has fulfilled its obligation to not cause unacceptable interference to any GSO network. NGSO FSS applicants are also required to include in each application for service the information required by § 25.146, which includes the ITU EPFD and PFD limits discussed in the *Report and Order*, in the narrative of the application pursuant to § 25.114(d)(12) of the Commission’s rules. As discussed previously, and as supported by Kuiper’s *ex parte*, the Commission concludes that the EPFD(is) limits provide sufficient protection for GSO FSS operators, negating the need for non-system-specific arc avoidance angles. Prior to initiating service, an NGSO FSS operator licensed or holding a market access authorization to operate in the 10.7–30.0 GHz range must receive a “favorable” or “qualified favorable” finding by the ITU Radiocommunication Bureau demonstrating compliance with the applicable ITU EPFD limits, which includes EPFD(is) limits, ensuring that any NGSO FSS operator is in compliance with these international limits prior to operation. The Commission finds that technical conditions adopted in the *Report and Order* in combination with the existing frameworks to ensure NGSO FSS operators comply with the ITU’s established power limits in the 17.3–17.7 GHz and 17.7–17.8 GHz band will protect GSO FSS operations in the 17.3–17.8 GHz band without requiring compliance with a more stringent arc avoidance angle.

The Commission notes that in particular circumstances, NGSO FSS and GSO FSS operators may jointly conclude that compliance with all applicable EPFD limits may not sufficiently protect the specific GSO FSS operations from in-line events, in which case GSO and NGSO FSS operators may coordinate to implement a protective arc avoidance angle. The Commission confirms that GSO FSS and NGSO FSS operators are permitted to enter into coordination agreements to specify a negotiated arc avoidance angle that is more protective than the angle detailed in the ITU EPFD input data files for systems operating in the 17.3–17.8 GHz band.

Additionally, the Commission declines to adopt DIRECTV and EchoStar’s proposal to create a process that would allow NGSO FSS operators to obtain a finding of EPFD compliance from the Commission as an alternative to an ITU finding of compliance. The Commission has previously determined that since NGSO FSS operators are required to use the ITU-approved

validation software to assess compliance with EPFD limits, the Commission’s review would duplicate that performed by the ITU Radio Communication Bureau. The Commission reaches the same conclusion in the *Report and Order*. Further, there is no record to support adopting a separate compliance framework that would function as an alternative to the ITU process and any such framework for independent Commission review is outside the scope of this proceeding.

3. Measures To Mitigate Ground Path Interference From Earth Station Operations

In the *17 GHz GSO Order*, the Commission adopted technical requirements and coordination procedures to protect 17.3–17.8 GHz band receiving FSS earth stations from ground path interference arising from uplink transmissions from nearby co-frequency DBS feeder link earth stations. The Commission amended § 25.203 of the rules to apply the coordination approach used to facilitate operations between DBS and 17/24 GHz BSS earth stations to FSS earth stations in the entire 17.3–17.8 GHz band, although FSS earth stations would not be entitled to protection from terrestrial fixed service stations in the 17.7–17.8 GHz band. In the *17 GHz GSO Order*, the Commission adopted rules to extend interference protection to individually licensed FSS receiving earth stations and facilitate authorization of blanket-licensed FSS earth stations and ESIMs on an unprotected basis in the 17.3–17.8 GHz band.

Individual and Blanket-Licensed Earth Stations and ESIMs. The *17 GHz GSO Order* amended § 25.115(e) of the rules to facilitate individual and blanket-licensed FSS earth stations in the 17.3–17.8 GHz band, with blanket licensed earth stations operating on an unprotected basis with respect to feeder links and all receiving FSS earth stations operating on an unprotected basis with respect to the fixed service in the 17.7–17.8 GHz band. The Commission also amended § 25.202 and footnote NG527A to streamline authorization of receiving ESIM earth stations on an unprotected basis in the band, finding that such receiving stations do not pose an interference threat to other services and will not place any undue coordination burden on incumbent operators if they are operating on an unprotected basis.

Commenters in the record voiced support for taking a similar approach in this proceeding and authorizing blanket-licensed earth stations and ESIMs receiving from NGSO FSS systems in

the 17 GHz band. Mangata believes that any concerns from fixed services providers about ESIMs receiving in the 17.3–17.8 GHz band are misplaced, noting that there is little difference between an ESIM and fixed FSS terminals with respect to transmission and that the PFD limits will sufficiently protect terrestrial fixed services from potential interference from NGSO transmissions, including receiving ESIMs. Kuiper also supports permitting blanket-licensed earth stations and ESIMs to operate in the 17 GHz band on an unprotected basis, consistent with the approach in the *17 GHz GSO Order*. Kuiper asserts that allowing NGSO ESIMs in the band will provide improved connectivity and enhanced vehicle diagnostics in areas that GSO ESIMs may not be able to reach, and that allowing both GSO and NGSO ESIMs will encourage competition and use the available spectrum more intensively. SpaceX also agrees that the Commission can extend the existing technical rules adopted for GSO FSS use to apply to NGSO FSS operations, including allowing blanket licensed earth station and ESIMs operations on an unprotected basis. SpaceX further notes that NGSO ESIMs can help to supplement gaps in service for maritime, airborne, and land operations, and that the Commission has already determined that allowing blanket licensing on an unprotected basis in the band will increase FSS operators' ability to use the band more efficiently for advanced satellite services without risk of interference to other services.

The Commission concluded in the *17 GHz GSO Order* that blanket-licensed earth stations and ESIMs operating on an unprotected basis in the 17.3–17.8 GHz band pose no interference threat to other services, nor will they place any undue coordination burden on incumbent operators. The Commission determined that it is in the public interest to allow these operations to increase FSS operators' flexibility to use the band more efficiently for the provisioning of advanced satellite services for the benefit of American consumers. With respect to concerns about the potential for harmful interference to terrestrial fixed services, the Commission found that the risk of interference is minimal and that the technical standards adopted in the *17 GHz GSO Order* are sufficient to protect those services irrespective of whether or not blanket-licensed earth stations or ESIMs would be permitted in the band.

The Commission finds that it is in the public interest to take the same approach in this proceeding and accordingly extend the authorization of

individual and blanket-licensed earth stations in the 17.3–17.8 GHz band to include NGSO FSS earth stations. The Commission modifies § 25.115(f)(2) of the Commission's rules to permit individual or blanket licensed earth stations in the 17.3–17.8 GHz band by amending the rule to include the 17.3–17.7 GHz band and the 17.7–17.8 GHz band as authorized bands for operation of individual or blanket license applications. Additionally, the Commission clarifies that blanket licensing in the 17.7–17.8 GHz band is on an unprotected basis with respect to current and future systems operating in the fixed service. Section 25.202(a)(10)(iii) of the Commission's rules is also revised to add the "17.3–17.7 GHz (space-to-Earth)" and "17.7–17.8 GHz (space-to-Earth)" frequency bands to the list of frequencies available for use by ESIMs communicating with NGSO FSS space stations. Accordingly, the Commission also modifies § 2.106(d)(527)(vi) (non-Federal government NG527A of the U.S. Table) to reflect this allocation.

C. Digital Equity and Inclusion

In the *17 GHz NGSO Notice*, the Commission noted its continuing efforts to advance digital equity for all, including people of color, persons with disabilities, persons who live in rural or Tribal areas, and others who are or have been historically underserved, marginalized, or adversely affected by persistent poverty or inequality. Specifically, the Commission asked for comment on any equity-related considerations and benefits associated with the proposals included in the *17 GHz NGSO Notice*, and how such proposals may promote or inhibit advances in diversity, equity, and inclusion, and accessibility, as well as the scope of the Commission's relevant legal authority.

Several parties commented on how digital equity and inclusion can be advanced with the proposals included in the *17 GHz NGSO Notice*. Kuiper asserts that allocating the 17.3–17.8 GHz band to NGSO FSS systems will increase the availability and quality of satellite broadband services, as NGSO FSS systems are well positioned to reach consumers in rural or impoverished areas and can help to mitigate disproportionate impacts of inadequate connectivity in these areas. Additionally, Kuiper notes that opening the band to NGSO FSS will help to bridge the digital divide by allowing for a greater variety of service providers offering more cost-effective broadband offerings to consumers and businesses, thereby creating more accessible and

affordable service options and increasing competition for consumers in remote or rural regions. SpaceX asserts that opening the 17 GHz band for NGSO FSS use presents an opportunity to provide critical broadband connectivity to consumers and businesses in all areas of the country with high-capacity, low latency broadband services. The Satellite Companies also note that permitting an NGSO FSS allocation in the 17 GHz band will allow for more efficient and intensive use of the band, in turn allowing consumers greater access to reliable satellite-enabled services in even the most remote locations and will help to meet the growing demands for spectrum resources for advanced, next-generation satellite services. Mangata agrees, asserting that the additional downlink capacity will further the Commission's goals of delivering high-speed broadband to unserved and underserved consumers, businesses, schools, and healthcare facilities.

The Commission agrees with commenters' positions that permitting NGSO FSS downlink operations in the 17 GHz band will provide increased availability of satellite services, resulting in greater and more reliable broadband services to consumers in rural and underserved areas and to all Americans. The Commission also agrees that these efforts to increase connectivity to historically underserved communities are in line with the Commission's mandate under the Communications Act and efforts to comply with Executive Order 13985. With these critical considerations in mind, the actions taken in the *Report and Order* to authorize NGSO FSS services in the 17 GHz band are aimed at increasing accessibility, supporting technological innovation and competition, and furthering the Commission's goal of increasing connectivity for all consumers.

IV. Final Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended (RFA), an Initial Regulatory Flexibility Analysis (IFRA) was incorporated in the *17 GHz NGSO Notice*. The Commission sought written public comment on the proposals in the *17 GHz NGSO Notice*, including comment on the IFRA. No comments were received on the IFRA. The Final Regulatory Flexibility Analysis (FRFA) in the *Report and Order* conforms to the RFA.

A. Need for, and Objectives of, the Report and Order

The *Report and Order* allocates spectrum for NGSO FSS downlink operations in the 17.3–17.7 GHz and 17.7–17.8 GHz frequency bands. More specifically, the Commission permits use of the 17.3–17.7 GHz band by NGSO FSS in the space-to-Earth (downlink) direction on a co-primary basis with incumbent services and on a shared, co-primary basis with geostationary satellite orbit space stations. The Commission also permits NGSO FSS downlink use of the 17.7–17.8 GHz on a co-primary basis with GSO FSS downlink operations and permit authorization of receiving FSS receiving earth stations and on a shared basis with respect to GSO FSS downlink operations. In addition, the *Report and Order* adopts technical standards to prevent harmful interference from NGSO satellites to incumbent service operations, geostationary satellite orbit operations, and terrestrial fixed services operating in the 17 GHz band. The Commission finds that NGSO in the FSS can share the 17 GHz band in an efficient and effective manner with GSO FSS and incumbent terrestrial fixed service without causing harmful interference. The rules adopted in the *Report and Order* will continue to facilitate the deployment of NGSO FSS systems capable of providing advanced satellite communication services across the nation, promote growth and innovation within the domestic and global space economy, and promote competition among NGSO FSS system operators in the provision of satellite communications services to consumers, as well as continue to advance the Commission’s goal of furthering the efficient use of spectrum.

B. Summary of Significant Issues Raised by Public Comments in Response to the IFRA

There were no comments filed that specifically addressed the rules and policies in the IFRA.

C. Response to Comments by the Chief Counsel for Advocacy of the Small Business Administration

Pursuant to the Small Business Jobs Act of 2010, which amended the RFA, the Commission is required to respond to any comments filed by the Chief Counsel for Advocacy of the Small Business Administration (SBA), and to provide a detailed statement of any change made to the proposed rules as a result of those comments. The Chief Counsel did not file any comments in

response to the proposed rules in this proceeding.

D. Description and Estimate of the Number of Small Entities to Which Rules Will Apply

The RFA directs agencies to provide a description of, and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted in the *Report and Order*. The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.” In addition, the term “small business” has the same meaning as the term “small business concern” under the Small Business Act. A “small business concern” is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the SBA.

Satellite Telecommunications. The industry comprises firms “primarily engaged in providing telecommunications services to other establishments in the telecommunications and broadcasting industries by forwarding and receiving communications signals via a system of satellites or reselling satellite telecommunications.” Satellite telecommunications service providers include satellite and earth station operations. The SBA small business size standard for this industry classifies a business with \$44 million or less in annual receipts as small. U.S. Census Bureau data for 2017 show that 275 firms in this industry operated for the entire year. Of this number, 242 firms had revenue of less than \$25 million. Additionally, based on Commission data in the 2022 Universal Service Monitoring Report, as of December 31, 2021, there were 65 providers that reported they were engaged in the provision of satellite telecommunications services. Of these providers, the Commission estimates that approximately 42 providers have 1,500 or fewer employees. Consequently, using the SBA’s small business size standard, a little more than half of these providers can be considered small entities.

All Other Telecommunications. This industry is comprised of establishments primarily engaged in providing specialized telecommunications services, such as satellite tracking, communications telemetry, and radar station operation. This industry also includes establishments primarily engaged in providing satellite terminal stations and associated facilities connected with one or more terrestrial

systems and capable of transmitting telecommunications to, and receiving telecommunications from, satellite systems. Establishments providing internet services or voice over internet protocol (VoIP) services via client-supplied telecommunications connections are also included in this industry. Establishment in this industry do not operate as telecommunications carriers. The SBA small business size standard for this industry classifies firms with annual receipts of \$40 million or less as small. U.S. Census Bureau data for 2017 show that there were 1,079 firms in this industry that operated for the entire year. Of those firms, 1,039 had revenue of less than \$25 million. Based on this data, the Commission estimates that the majority of “All Other Telecommunications” firms can be considered small.

E. Description of Projected Reporting, Recordkeeping, and Other Compliance Requirements for Small Entities

The *Report and Order* adopts several rule changes that would affect compliance requirements for entities operating NGSO FSS systems in the 17 GHz band. For example, the *Report and Order* adopts rules for operations by NGSO FSS operators in the 17.3–17.8 GHz band, including revisions to some existing technical requirements that will now apply to these FSS operations. With regard to compliance costs that could result from requirements adopted in this proceeding, the record does not include the requisite cost analysis or information that would allow the Commission to quantify the costs of compliance for any impacted small entities, including whether it will be necessary for small entities to hire professionals to comply with the adopted rules. In total, the actions in the *Report and Order* are designed to achieve the Commission’s mandate to regulate in the public interest while imposing the lowest necessary burden on all affected parties, including small entities.

F. Steps Taken To Minimize the Significant Economic Impact on Small Entities and Significant Alternatives Considered

The RFA requires an agency to provide, “a description of the steps the agency has taken to minimize the significant economic impact on small entities . . . including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in the final rule and why each one of the other significant alternatives to the rule considered by the agency which affect

the impact on small entities was rejected.”

In the *Report and Order*, the Commission considers whether and how to apply various technical rules to enable NGSO FSS operations to share the 17.3–17.8 GHz band with other services in an efficient and effective manner while protecting other authorized users of the band from harmful interference. This includes consideration, for example, of power levels and other technical considerations, and what information the Commission may need to assess compliance with technical requirements, taking into consideration potential impact on the applicant or operator. As one example, the Commission declines to require submission of additional technical information prior to satellite operation, instead requiring that NGSO FSS applicants submit information that operators will have already prepared and submitted to international bodies for review and certification. The Commission also declines to impose reporting requirements that would require operators to gather or produce any new other data specific to the rules adopted in the *Report and Order*.

With regard to EPFD limits applicable to the 17.8–18.4 GHz band, the Commission considers and extends the EPFD limits applicable to the 17.8–18.4 GHz band to the adjacent 17.3–17.7 GHz band, and similarly extends these EPFD limits to the 17.7–17.8 GHz band. The Commission agrees with commenters that the existing EPFD limits are sufficient to protect DBS space stations and BSS receive stations from potential interference, and are sufficient to address concerns raised by GSO FSS operators that proposed an exclusion zone angle. Therefore, the Commission declines to adopt additional requirements which could increase the economic impact and burden of compliance with the *Report and Order*. The Commission also declines to require additional technical showings regarding arc avoidance angle compliance in applications for NGSO licenses which would add an additional component to the application requirements and could increase the burden of compliance. Similarly regarding coordination, consistent with commenters’ positions that the Commission has sufficient frameworks in place for sharing and coordination between NGSO and GSO operators, the Commission declines to modify these existing frameworks to add an additional compliance approval process in this proceeding. Overall, the Commission’s actions not to impose

certain new and/or additional reporting and other requirements will help minimize the economic impact and reduce the compliance burdens for small and other affected licensees.

G. Report to Congress

The Commission will send a copy of the *Report and Order*, including the FRFA, in a report to be sent to Congress pursuant to the Congressional Review Act. In addition, the Commission will send a copy of the *Report and Order*, including the FRFA, to the Chief Counsel for Advocacy of the SBA.

V. Ordering Clauses

Accordingly, *it is ordered* that, pursuant to the authority found in §§ 4(i), 7(a), 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 157(a), 303(c), 303(f), 303(g), and 303(r), the *Report and Order is hereby adopted*.

It is further ordered that the *Report and Order*, including the rules set forth at Appendix A, *shall be effective* 30 days after publication in the **Federal Register**.

It is further ordered that the Commission’s Office of the Secretary *shall send* a copy of the *Report and Order*, including the Final Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

It is further ordered that the Commission’s Office of the Managing Director, Performance and Program Management, *shall send* a copy of the *Report and Order* in a report to be sent to Congress and the Government Accountability Office pursuant to the Congressional Review Act, *see* 5 U.S.C. 801(a)(1)(A).

List of Subjects

47 CFR Part 2

Communications, Satellites, Telecommunications.

47 CFR Part 25

Incorporation by reference, Satellites.

Federal Communications Commission.

Marlene Dortch,

Secretary.

Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 2 and 25 as follows:

PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

■ 1. The authority citation for part 2 continues to read as follows:

Authority: 47 U.S.C. 154, 302a, 303, and 336, unless otherwise noted.

■ 2. Amend § 2.106 by revising paragraphs (d)(58)(i) and (iv) and (d)(527)(vi) to read as follows:

§ 2.106 Table of Frequency Allocations.

* * * * *

(d) * * *

(58) * * *

(i) The use of the band 17.3–17.8 GHz by the broadcasting-satellite service is limited to geostationary satellites.

* * * * *

(iv) In the band 17.7–17.8 GHz, earth stations in the fixed-satellite service may be authorized for the reception of FSS emissions from geostationary satellites and non-geostationary satellites, subject to the condition that these earth stations shall not claim protection from transmissions of non-Federal stations in the fixed-service that operate in the band.

* * * * *

(527) * * *

(vi) In the band 17.3–17.8 GHz, ESIMs may be authorized for the reception of FSS emissions from geostationary satellites and non-geostationary satellites on an unprotected basis.

* * * * *

PART 25—SATELLITE COMMUNICATIONS

■ 3. The authority citation for part 25 continues to read as follows:

Authority: 47 U.S.C. 154, 301, 302, 303, 307, 309, 310, 319, 332, 605, and 721 unless otherwise noted.

■ 4. Amend § 25.115 by revising paragraph (f)(2) to read as follows:

§ 25.115 Applications for earth station authorizations.

* * * * *

(f) * * *

(2) Individual or blanket license applications may be filed for operation in the 10.7–12.7 GHz, 14–14.5 GHz, 17.3–17.7 GHz, 17.7–17.8 GHz, 17.8–18.6 GHz, 18.8–19.4 GHz, 19.6–20.2 GHz, 28.35–29.1 GHz, or 29.5–30.0 GHz bands; however, ESIMs cannot operate in the 28.35–28.4 GHz band and blanket licensing in the 10.7–11.7 GHz, 17.7–17.8 GHz, 17.8–18.3 GHz, 19.3–19.4 GHz, and 19.6–19.7 GHz bands is on an unprotected basis with respect to current and future systems operating in the fixed service.

* * * * *

■ 5. Amend § 25.124 by revising paragraph (a)(6) to read as follows:

§ 25.124 Unified space station and earth station authorization.

(a) * * *

(6) NGSO FSS: 10.7–12.7 GHz, 14.4–14.5 GHz, 17.3–17.8 GHz, 17.8–18.6 GHz, 18.8–19.4 GHz, 19.6–20.2 GHz, 28.35–29.1 GHz, 29.5–30.0 GHz, 40–42 GHz, and 48.2–50.2 GHz;

* * * * *

■ 6. Amend § 25.146 by revising paragraphs (a)(1) and (2) to read as follows:

§ 25.146 Licensing and operating provisions for NGSO FSS space stations.

(a) * * *

(1) Any applicable power flux-density levels in Article 21, Section V, Table 21–4 of the ITU Radio Regulations (incorporated by reference, § 25.108), except:

(i) in the 19.3–19.4 GHz and 19.6–19.7 GHz bands, applicants must certify that they will comply with the ITU power flux-density limits governing NGSO FSS systems in the 17.7–19.3 GHz band; and

(ii) in the 17.3–17.7 GHz band, applicants must certify that they will comply with the ITU power flux-density limits governing NGSO FSS systems in the 17.7–17.8 GHz band; and

(2) Any applicable equivalent power flux-density levels in Article 22, Section II, and Resolution 76 of the ITU Radio Regulations (both incorporated by reference, § 25.108), except that for operations in the 17.3–17.8 GHz band, applicants must certify that they will comply with the ITU equivalent power flux-density limits applicable to NGSO FSS system operations in the 17.8–18.4 GHz band.

* * * * *

■ 7. Amend § 25.202 by revising paragraphs (a)(1)(iii) and (a)(10)(iii) to read as follows:

§ 25.202 Frequencies, frequency tolerance, and emission limits.

(a) * * *

(1) * * *

(iii) The U.S. non-Federal Table of Frequency Allocations, in § 2.106 of this chapter, is applicable between Commission space station licensees relying on a U.S. ITU filing and transmitting to or receiving from anywhere on Earth, including airborne earth stations, in the 17.3–20.2 GHz or 27.5–30.0 GHz bands.

* * * * *

(10) * * *

(iii) The following frequencies are available for use by Earth Stations in Motion (ESIMs) communicating with NGSO FSS space stations, subject to the provisions in § 2.106 of this chapter:

- 10.7–11.7 GHz (space-to-Earth)
- 11.7–12.2 GHz (space-to-Earth)
- 14.0–14.5 GHz (Earth-to-space)
- 17.3–17.7 GHz (space-to-Earth)

- 17.7–17.8 GHz (space-to-Earth)
- 17.8–18.3 GHz (space-to-Earth)
- 18.3–18.6 GHz (space-to-Earth)
- 18.8–19.3 GHz (space-to-Earth)
- 19.3–19.4 GHz (space-to-Earth)
- 19.6–19.7 GHz (space-to-Earth)
- 19.7–20.2 GHz (space-to-Earth)
- 28.4–28.6 GHz (Earth-to-space)
- 28.6–29.1 GHz (Earth-to-space)
- 29.5–30.0 GHz (Earth-to-space)

* * * * *

[FR Doc. 2024–28390 Filed 12–4–24; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R2–ES–2022–0173; FXES1111090FEDR–256–FF09E21000]

RIN 1018–BF79

Endangered and Threatened Wildlife and Plants; Endangered Species Status for Swale Paintbrush

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Final rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), determine endangered species status under the Endangered Species Act of 1973 (Act), as amended, for the swale paintbrush (*Castilleja ornata*), a flowering plant species from New Mexico within the United States and the states of Chihuahua and Durango in Mexico. This rule extends the Act’s protections to the species. We find that designating critical habitat for the swale paintbrush is not prudent.

DATES: This rule is effective January 6, 2025.

ADDRESSES: This final rule, supporting materials we used in preparing this rule (such as the species status assessment report), and comments we received on the June 8, 2023, proposed rule are available on the internet at <https://www.regulations.gov> under Docket No. FWS–R2–ES–2022–0173.

FOR FURTHER INFORMATION CONTACT: Shawn Sartorius, Field Supervisor, U.S. Fish and Wildlife Service, New Mexico Ecological Services Field Office, 2105 Osuna Road NE, Albuquerque, NM 87113; telephone 505–346–2525. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States

should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act (16 U.S.C. 1531 *et seq.*), a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species’ critical habitat to the maximum extent prudent and determinable. We have determined that the swale paintbrush meets the Act’s definition of an endangered species; therefore, we are listing it as such. Listing a species as an endangered or threatened species can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 *et seq.*).

What this document does. This rule lists the swale paintbrush as an endangered species under the Act.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that habitat loss and fragmentation, hydrological alteration, altered fire regimes, effects from intensive grazing pressure, exotic plant invasion, climate change impacts (*i.e.*, drought and increased cool season temperatures), and the cumulative effects of multiple stressors are threats to the swale paintbrush to the degree that listing it as an endangered species under the Act is warranted. Additionally, future collection risk may have compounding impacts on the species’ viability.

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary), to the maximum extent prudent and determinable, concurrently with listing designate critical habitat for the species. We have determined that designating critical habitat for the swale paintbrush