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

In the Matter of	)	
	)	
Amendment of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Sharm el-Sheikh, 2019) (WRC-19), Revision to Table Mountain Radio Quiet Zone Field Strength Limits	)	ET Docket No. 23-121

NOTICE OF PROPOSED RULEMAKING

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I. INTRODUCTION

1. This Notice of Proposed Rulemaking (*WRC-19 Notice*) follows the *WRC-19*

Administrative Order,[1] which made non-substantive, editorial revisions to the U.S. Table of Frequency Allocations (U.S. Table) and to other related rules to reflect International Telecommunication Union (ITU) decisions made at the 2019 World Radiocommunication Conference (WRC-19). In this *WRC-19 Notice*, we propose to amend, as appropriate, parts 2 and 25 of the Commission's rules to implement in the U.S. Table specific allocation decisions from the *WRC-19 Final Acts*[2] concerning portions of the radio spectrum between 495 kHz and 50.9 GHz, make other allocation changes, and make related updates to our service rules in this frequency range. Many of these proposals are based on the National Telecommunications and Information Administration's (NTIA) recommendations for national implementation of the *WRC-19 Final Acts*.[3] Collectively, our proposals are designed to harmonize our spectrum allocations with and conform our rules to the *WRC-19 Final Acts* to the extent that doing so would better meet domestic requirements.

2. In this *WRC-19 Notice*, we propose to:

Satellite Issues

- Make the space operation service in the bands 137-138 MHz (space-to-Earth) and 148-149.9 MHz (Earth-to-space) available for use by non-geostationary satellite orbit short-duration mission systems in accordance with Resolution 32 (WRC-19).
- Adopt power limits for earth stations in the mobile-satellite service that transmit in the 399.9-400.05 MHz band, except for telecommand uplinks within the mobile satellite service in the 400.02-400.05 MHz band.
- Allocate the 1621.35-1626.5 MHz band to the maritime mobile-satellite service (space-to-Earth) on a primary basis for Federal and non-Federal shared use to provide additional satellite coverage to the Global Maritime Distress and Safety System (GMDSS) subject to four footnotes in the U.S. Table which would protect stations of the radio astronomy service operating in the 1610.6-1613.8 MHz band from harmful interference and prevent maritime mobile earth stations receiving in the 1621.35-1626.5 MHz band from imposing constraints on certain other earth stations operating in the 1621.35-1626.5 MHz or adjacent bands.
- Provide conditions for earth stations in motion (ESIMs) communicating with geostationary orbit fixed-satellite service (GSO FSS) space stations in the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands that are consistent with the existing Commission rules regarding ESIMs operations.
- Limit the unwanted emissions power in the 50.2-50.4 GHz passive band from earth stations in the fixed-satellite service (Earth-to-space) that transmit in the adjacent bands 49.7-50.2 GHz and 50.4-50.9 GHz.

Terrestrial Issues

[1] *Amendment of the Commission's Rules Regarding Implementation of the Final Acts of the World Radiocommunication Conference (Sharm el-Sheikh, 2019) (WRC-19), Other Allocation Issues, and Related Rule Updates*, Order, ET Docket No. 23-121, 38 FCC Rcd 3528 (2023) (*WRC-19 Administrative Order*).

[2] World Radiocommunication Conference 2019 (WRC-19) Final Acts, (*WRC-19 Final Acts*) https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.14-2019-PDF-E.pdf (last visited Jan. 8, 2025).

[3] *Infra* note 14. The Federal Communications Commission (FCC), an independent agency, administers non-Federal radio spectrum, and NTIA, an agency of the U.S. Department of Commerce, administers Federal radio spectrum. NTIA sets forth regulations for Federal use of the radio spectrum within its Manual of Regulations and Procedures for Federal Radio Frequency Management (*NTIA Manual*). 47 CFR §§ 2.1(c), 2.105(a), 300.1.

- Make the band 495-505 kHz available for use by the international Navigational Data (NAVDAT) system as described in the most recent version of Recommendation ITU-R M.2010 and limit NAVDAT transmitting stations to coast stations.
- Define and implement a new field strength limit for frequencies at and above 15.7 GHz in the vicinity of the Table Mountain Quiet Zone.

II. BACKGROUND

3. The International Telecommunications Union (ITU)[4] convenes a World Radiocommunication Conference (WRC) typically every three to four years to address international spectrum use. Specifically, the ITU allocates frequency bands to various radio services generally on either a worldwide or regional basis and enters these radio services in its Table of Frequency Allocations (which is reflected in section 2.106 of our rules[5] as the International Table) as part of the ITU Radio Regulations.[6]

4. The Commission conducted its primary preparations for WRC-19 via its 2019 World Radiocommunication Conference Advisory Committee (WAC), which held eight public meetings between August 2, 2016, and March 11, 2019, to evaluate and approve recommendations and preliminary views that it later submitted for Commission consideration.[7] The ITU held a conference preparatory meeting (CPM) from February 18, 2019 through February 28, 2019, to prepare and approve a report on the technical, operational, and regulatory/procedural matters relevant to the WRC-19 agenda, which the Commission participated in.[8] In addition, the United States worked with other nations to craft common proposals for Region 2 (North and South America).[9] By August 1, 2019, the United States had provided its contributions to the Inter-American Telecommunication Commission (CITEL), which then provided the Region 2 proposals to WRC-19.[10]

5. The ITU convened WRC-19 from October 28, 2019 to November 22, 2019, in Sharm el-

[4] When we refer to the ITU in this document, we are generally referring to the ITU Radiocommunication Sector (ITU-R). The work of ITU-R is organized and coordinated by the Director of the Radiocommunication Bureau (referred to as the "Bureau" in the ITU Radio Regulations, including the International Table). Under its constitution, the ITU is charged with allocating bands of the radiofrequency (RF) spectrum, allotting radio frequencies, and registering RF assignments in order to avoid harmful interference between radio stations of different countries. The ITU constitution also provides that world radiocommunication conferences "shall normally be convened every three to four years" to consider specific radiocommunication matters. *See* Constitution and Convention of the International Telecommunication Union adopted by the 2018 Plenipotentiary Conference (published in Basic Texts, 2019), http://handle.itu.int/11.1004/020.1000/5, at 5, 21, 90. *See also* the ITU Radiocommunication Sector's homepage, http://www.itu.int/en/ITU-R (last visited Jan. 8, 2025).

[5] 47 CFR § 2.106.

[6] The ITU may also include allocation use conditions, which are specified in international footnotes to the International Table of Frequency Allocations (International Table) and may be included in the U.S. Table.

[7] The WAC was chartered under the Federal Advisory Committee Act (FACA) to provide the Commission with advice, technical support, and recommended proposals for WRC-19. The Commission published the committee's recommendations for public comment. After consideration by the U.S. Government, many of the recommendations became a part of the U.S. views and draft proposals. For the Commission's WRC-19 homepage, *see* https://www.fcc.gov/wrc-19 (last visited Jan. 8, 2025).

[8] *See* ITU Radiocommunication Sector "CPM Report on technical, operational and regulatory/procedural matters to be considered by the World Radiocommunication Conference 2015" (*CPM Report to WRC-19*), https://www.itu.int/dms_pub/itu-r/md/15/cpm19.02/r/R15-CPM19.02-R-0001!!PDF-E.pdf.

[9] *See* "U.S. WRC-19 Contributions to CITEL PCC.II" (updated on 11/13/2018), https://www.fcc.gov/us-contributions-sent-citel-pccii-0.

[10] *See* CITEL's WRC-19 Inter-American Proposals (IAPs) at https://www.fcc.gov/us-contributions-sent-citel-pccii-0.

Sheikh, Egypt, with 163 Member States, including the United States, participating.[11] WRC-19 addressed 52 topics related to frequency allocation and frequency sharing for the efficient use of spectrum and orbital resources, and adopted allocation changes that affect both Federal and non-Federal entities.[12] The ITU published the decisions made at WRC-19 as the *WRC-19 Final Acts* and subsequently revised the Radio Regulations to incorporate these decisions.[13] On April 2, 2021, NTIA submitted its recommendations for national implementation of the *WRC-19 Final Acts* to the Commission.[14]

6. On April 21, 2023, the Commission released the *WRC-19 Administrative Order*, which reflected the WRC-19 changes to the International Table and made other non-substantive, editorial changes to the Commission's rules, including revisions to the Federal Table that did not require notice and comment.[15]

7. We are only addressing those WRC-19-related proposals that are specifically discussed in this Notice of Proposed Rulemaking (*WRC-19 Notice)*. Any additional WRC-related actions, including those recommended by NTIA,[16] have been or are anticipated to be addressed in separate proceedings or are no longer appropriate for further action at this time. We nevertheless invite commenters to identify alternate ways we could give effect to those WRC-19 matters discussed in this Notice of Proposed Rulemaking.

8. In this *WRC-19 Notice*, we propose to: (1) implement certain WRC-19 allocation decisions as discussed herein; (2) revise parts 2 and 25 of the rules reflect the allocation changes that we are proposing in this Notice; and (3) make other allocation changes that are not related to WRC-19 implementation.[17] We first address satellite issues, followed by terrestrial issues.

[11] *See* World Radiocommunication Conference 2019 (WRC-19), Sharm el-Sheikh, Egypt, 28 October to 22 November 22 2019, https://www.itu.int/en/ITU-R/conferences/wrc/2019/Pages/default.aspx (last visited Jan. 8, 2025).

[12] "Results of the 2019 World Radiocommunication Conference (WRC-19)," https://www.itu.int/en/ITU-R/seminars/wrs/2020/Plenary%20Sessions%20%20Presentations/01.%20Opening%20and%20General%20-%2030%20Nov%202020/P4.%20Results%20of%20the%20WRC-19.pdf (last visited Jan. 8, 2025).

[13] *Supra* note 2.

[14] Letter from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald Repasi, Acting Chief, FCC Office of Engineering and Technology, dated Apr. 2, 2021 (*NTIA WRC-19 Implementation Recommendations*).

[15] *Supra.* note 1.

[16] *See NTIA WRC-19 Implementation Recommendations supra* note 14.

[17] The proposal not related to WRC-19 implementation concerns the definition and implementation of a new field strength limit at and above 15.7 GHz in the vicinity of the Table Mountain Quiet Zone. *See* NTIA Table Mountain Letter to FCC reference Quiet Zones; e-mail from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald Repasi, Chief, FCC Office of Engineering and Technology, dated July 18, 2024, (*NTIA Table Mountain Letter*) https://www.fcc.gov/ecfs/search/search-filings/filing/107180694517066 (last visited Jan. 8, 2025).

III. NOTICE OF PROPOSED RULEMAKING

A. Satellite Issues

1. Use of Space Operation Service by Non-Geostationary Satellites Below 1 GHz for Short-duration Missions

9. We propose to make the space operation service[18] in the 137-138 MHz space-to-Earth (downlink) band and the 148-149.9 MHz Earth-to-space (uplink) band available to space stations in non-geostationary orbits (NGSO) with short-duration (3 years or less) missions by adding references to three international footnotes (5.203C, 5.209A, 5.218A)[19] to particular sub-bands in the Federal and non-Federal Tables of the U.S. Table of Frequency Allocations.[20]

10. As background, the 137-138 MHz and 148-149.9 MHz bands are Federal/non-Federal shared bands. Under the Commission's rules, the 137-138 MHz band is allocated on a primary basis to the space operation, meteorological-satellite, and space research services (all space-to-Earth) for Federal and non-Federal use; the 137-137.025 MHz and 137.175-137.825 MHz sub-band is also allocated on a primary basis to the mobile-satellite service (MSS) (space-to-Earth) for Federal and non-Federal use; and the 137.025-137.175 MHz and 137.825-138 MHz sub-bands are allocated to the MSS (space-to-Earth) on a secondary basis for Federal and non-Federal use.[21] The 148-149.9 MHz band is allocated to the fixed and mobile services and the MSS (Earth-to-space) service on a primary basis for Federal use; and to the MSS (Earth-to-space) service on a primary basis for non-Federal use.[22] The demand for suitable spectrum

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[18] Under the Commission's rules, the space operation service is defined as a radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry and space telecommand. These functions will normally be provided within the service in which the space station is operating. 47 CFR § 2.1(c). Telemetry, tracking, and command signals may be transmitted in frequencies within the assigned bands that are not at a band edge only if the transmissions cause no greater interference and require no greater protection from harmful interference than the communications traffic on the satellite network or have been coordinated with operators of authorized co-frequency space stations at orbital locations within six degrees of the assigned orbital location. Frequencies, polarization, and coding of telemetry, tracking, and command transmissions must be selected to minimize interference into other satellite networks. 47 CFR § 25.2029(g)(1)-(2).

[19] 47 CFR § 2.106(b)(203), (209)(i), (218)(i).

[20] NTIA WRC-19 Implementation Recommendations, Annex 1.7, WRC-19 Agenda Item 1.7 (Space Operations Service for non-GSO Satellites with Short Duration Below 1 GHz), at 11-12. We propose to add footnote 5.203C to the sub-bands 137-137.025 MHz, 137.025-137.175 MHz, 137.175-137.825 MHz, and 137.825-138 MHz; footnote 5.209A to 137.175-137.825 MHz; and footnote 5.218A to the 148-148.9 MHz band.

[21] 47 CFR § 2.106(a).

[22] 47 CFR § 2.106(a). MSS operations in the 137-138 MHz and 148-149.9 MHz bands are subject to the conditions in footnotes US319 (47 CFR § 2.106(a), (c)(319)) and US320 (47 CFR § 2.106(a), (c)(320)); MSS operations in the 137-138 MHz band are subject to the condition in footnote 5.208 (47 CFR § 2.106(a), (b)(208)); MSS operations in the 148-149.9 MHz band are subject to the conditions in footnotes 5.218, 5.219, US323, and US325 (47 CFR § 2.106(a), (b)(218), (219); (c)(323), (325)). Footnotes US319 and US320 state that, in the 137-138 MHz, 148-149.9 MHz, and other bands, Federal stations in the mobile-satellite service (MSS) are limited to earth stations operating with non-Federal space stations; and that the use of these bands by the MSS is limited to non-voice, non-geostationary satellite systems and may include satellite links between land earth stations at fixed locations, respectively. (47 CFR § (c)(319), (320)). Footnote US323 states that in the band 148-149.9 MHz, no individual mobile earth station shall transmit on the same frequency being actively used by fixed and mobile stations and shall transmit no more than 1% of the time during any 15 minute period; except, individual mobile earth stations in this band that do not avoid frequencies actively being used by the fixed and mobile services shall not exceed a power density of −16 dBW/4 kHz and shall transmit no more than 0.25% of the time during any 15 minute period. Any single transmission from any individual mobile earth station operating in this band shall not exceed 450 ms in duration and consecutive transmissions from a single mobile earth station on the same frequency shall be separated by at least 15 seconds. Land earth stations in this band shall be subject to electromagnetic compatibility analysis and coordination with terrestrial fixed and mobile stations. (47 CFR § 2.106(c)(323)). Footnote US325 states that in the band 148-149.9

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for NGSO satellites with short duration missions is growing due to the increasing number of these types of satellite missions. These types of missions provide affordable options for scientific and commercial space purposes and are increasingly used by new entrants in the space sector taking advantage of decreasing costs associated with launch.

11. The Commission specifically proposes to add the following footnotes to the Federal and non-Federal portions of the U.S. Table to align it with the changes made in the *WRC-19 Final Acts*. First, we propose to add footnote 5.203C to the 137-137.025 MHz, 137.025-137.175 MHz, 137.175-137.825 MHz, and 137.825-138 MHz sub-bands. Footnote 5.203C states that: (1) the use of the space operation service (space-to-Earth) with NGSO satellite short duration- mission systems in the 137-138 MHz band is subject to Resolution 660 (WRC-19);[23] (2) Resolution 32 (WRC-19) applies;[24] and (3) these systems must not cause harmful interference to, or claim protection from, the existing services to which the band is allocated on a primary basis.[25] Resolution 660 limits the use of space operation service (space-to-Earth)

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MHz, fixed and mobile stations shall not claim protection from land earth stations in the mobile-satellite service that have been previously coordinated; Federal fixed and mobile stations exceeding 27 dBW EIRP, or an emission bandwidth greater than 38 kHz, will be coordinated with existing mobile-satellite service space stations. (47 CFR § 2.106(c)(325)). Footnotes 5.208 and 5.219 state that the use of the 137-138 MHz and 148-149.9 MHz bands, respectively, by the MSS is subject to coordination under No. 9.11A; and footnote 5.219 further states that the MSS must not constrain the development and use of the fixed, mobile, and space operation services in the band 148-149.9 MHz; footnote 5.219 also states that use of the frequency band 148-149.9 MHz by non-geostationary-satellite systems in the space operation service identified as short-duration mission is not subject to No. 9.11A. Footnote 5.218 states that the 148-149.9 MHz band is also allocated to the space operation service (Earth-to-space) on a primary basis, subject to agreement under No. 9.21. The bandwidth of any individual transmission shall not exceed ± 25 kilohertz. Under No. 9.21, before an administration notifies to the Bureau (i.e., ITU) or brings into use a frequency assignment or any station of a service for which the requirement to seek the agreement of other administrations is included in a footnote to the Table of Frequency Allocations referring to this provision, it shall effect coordination, as required, with other administrations identified under No. 9.27. *See* ITU Radio Regulations, Edition of 2020, Vol. 1, ARTICLE 9 Procedure for effecting coordination with or obtaining agreement of other administrations, Section II − Procedure for effecting coordination, Sub-Section IIA − Requirement and request for coordination, 9.6, 9.21, at 198, 200, https://www.itu.int/en/ITU-R/space/WRS16space/ART-9.pdf (last visited Jan. 8, 2025). 47 CFR § 2.106(a), (b)(208), (218), (219), (c)(319), (320), (323), (325).

[23] In Resolution 660, WRC-19 resolves that: 1) the use of the space operation service (SOS) (space-to-Earth) for NGSO systems with short-duration missions in the 137-138 MHz range shall be limited to the 137.025-138 MHz band; 2) in the 137.025-138 MHz band, the power flux-density at any point on the Earth's surface produced by a space station of NGSO SOS systems used for short-duration missions in accordance with Appendix 4 shall not exceed −140 dB(W/(m² · 4 kHz)); and 3) administrations wishing to implement the SOS (space-to-Earth) in the 137.025-138 MHz band by means of NGSO systems for short-duration missions shall ensure compliance with considering *d)* (i.e., that the overall occupied bandwidth of any emission should be maintained completely within the frequency band allocated to the application identified in the SOS with short-duration missions, including any offsets such as Doppler shift or frequency tolerances). *See* ITU Radio Regulations, Edition of 2020, Vol. 3, Resolution 660 (WRC-19), *resolves* 1, 2, and 3, at 465, https://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.44.48.en.103.pdf (last visited Jan. 8, 2025).

[24] In Resolution 32, WRC-19 resolves, *inter alia*, that the Resolution shall apply only to NGSO networks or systems identified by the notifying administration as effecting short-duration missions and corresponding to the following criteria: 1) the network or system shall operate under any space radiocommunication service on frequency assignments that are not subject to the application of Section II of Article 9; 2) the maximum period of operation and validity of frequency assignments of a NGSO network or system identified as short-duration mission shall not exceed three years from the date of bringing into use of the frequency assignments, without any possibility of extension, after which the recorded assignments shall be cancelled; and 3) the total number of satellites in a NGSO network or system identified as short-duration mission shall not exceed 10 satellites. *See* ITU Radio Regulations, Edition of 2020, Vol. 3, Resolution 32 (WRC-19), *resolves* 1, 1.1, 1.2, and 1.3, at 42, https://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.44.48.en.103.pdf (last visited Jan. 8, 2025).

[25] 47 CFR § 2.106(b)(203).

NGSO systems with short-duration missions in the 137-138 MHz frequency range to the 137.025-138 MHz sub-band and limits the power flux-density at any point on the Earth's surface produced by a space station of such non-GSO systems used for short-duration missions to −140 dB(W/(m^2 · 4 kHz)).[26] Resolution 32 (WRC-19) states that the maximum period of operation and validity of frequency assignments of a NGSO network or system identified as short-duration mission must not exceed three years[27] from the date of bringing into use[28] of the frequency assignments, without any possibility of extension, after which the recorded assignments shall be cancelled; and that the total number of satellites in a NGSO network or system identified as a short-duration mission shall not exceed 10 satellites.[29] We seek comment on this proposal.

12. We also propose to add footnote 5.209A in the 137.175-137.825 MHz sub-band. Footnote 5.209A overrides the coordination requirement in much (650 kilohertz) of the spectrum to which footnote 5.203C (above) applies, i.e., it states that the use of the 137.175-137.825 MHz band by NGSO satellite systems in the space operation service identified as a short-duration mission in accordance with Appendix 4 is not subject to No. 9.11A.[30] We seek comment on this proposal.

13. We also propose to add footnote 5.218A in the 148-149.9 MHz sub-band. Footnote 5.218A states that, in the 148-149.9 MHz band, the space operation service (Earth-to-space) may be used by NGSO systems with short-duration missions; that such systems used in accordance with Resolution 32 (discussed above) are not subject to agreement under No. 9.21, that such systems must not cause unacceptable interference to, or claim protection from, existing primary services within this frequency band, or impose additional constraints on the space operation and mobile-satellite services, and that earth stations in such systems must ensure that the power flux-density does not exceed −149 dB(W/(m² · 4 kHz)) for more than 1% of time at the border of the territory of 16 specified countries.[31] Finally, footnote 5.218A states that, at the stage of coordination with other administrations, the provisions of Nos. 9.17 and 9.18 also apply.[32] We request comment on this proposal.

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[26] ITU Radio Regulations, Edition of 2020, Resolution 660 (WRC-19), *resolves* 1-3, at 465, https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F00139PDFE.pdf (last visited Jan. 8, 2025).

[27] Resolution 32 (WRC-19) considers the operational lifetime of short-duration NGSO satellites to generally range from several weeks up to not more than three years. *See* ITU Radio Regulations (Edition of 2020), Resolution 32 (WRC-19), *resolves considering d),* https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F0015PDFE.pdf (last visited Jan. 8, 2025).

[28] The date of bringing into use of a NGSO network or system identified as a short-duration mission shall be defined as the launch date of a satellite in the case of a NGSO network or of the first satellite in the case of a NGSO system requiring multiple launches (*see resolves* 5 of Resolution 32 (WRC-19)).

[29] ITU Radio Regulations (Edition of 2020), Resolution 32 (WRC-19), *resolves* 1.2, 1.3. https://www.itu.int/dms_pub/itu-r/oth/0C/0A/R0C0A00000F0015PDFE.pdf (last visited Jan. 8, 2025).

[30] 47 CFR § 2.106(b)(209)(i). Provision No. 9.6 states that "Before an administration notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **9.27**:" The list of cases include provision No. 9.11A, which states "for a station for which the requirement to coordinate is included in a footnote to the Table of Frequency Allocations referring to this provision, the provisions of Nos. 9.12 to 9.16 are applicable." *See* ITU Radio Regulations, Edition of 2020, Vol. 1, Article 9, Nos. 9.6 and 9.11A, at 198-99, https://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.44.48.en.101.pdf (last visited Jan. 8, 2025).

[31] 47 CFR § 2.106(b)(218)(i). These countries are Armenia, Azerbaijan, Belarus, China, Korea (Rep. of), Cuba, Russian Federation, India, Iran (Islamic Republic of), Japan, Kazakhstan, Malaysia, Uzbekistan, Kyrgyzstan, Thailand and Viet Nam. In case this power flux-density limit is exceeded, agreement under No. 9.21 is required to be obtained from countries mentioned in this footnote.

[32] 47 CFR § 2.106(b)(218)(i). Provision No. 9.6 states that "Before an administration notifies to the Bureau or brings into use a frequency assignment in any of the cases listed below, it shall effect coordination, as required, with other administrations identified under No. **9.27**:" The list of cases include provision Nos. 9.17 and 9.18, which

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14. If the proposed use of the 137-138 MHz and 148-149.9 MHz bands by the space operation service is adopted, we request additional comment on how incumbent services operating in the proposed bands would be protected from interference due to increased short-duration NGSO usage of the band, outside of the limits proposed in Resolution 660.[33] We also seek comment on whether we should require applicants in the space operation service operating short-duration NGSO's below 1 GHz to coordinate with MSS licensees already operating in those bands. Lastly, we seek comment on the general parameters of the application and licensing process applicable to short-duration NGSO operations in the space operations service in the 137-138 MHz and 148-149.9 MHz bands.

15. We note the Commission's ongoing In-Space Servicing and Manufacturing Notice of Proposed Rulemaking (*ISAM Notice*), in which the Commission reached a tentative conclusion that at least some ISAM operations could fall within the definition of the space operations service.[34] We additionally note the Commission's part 25 Streamlined Small Satellite Process, which could also be applicable to short-duration NGSO operations in the space operations service.[35] We reach a tentative conclusion that our existing part 25[36], part 5[37], and part 97[38] rules are sufficient and give short-duration NGSO operators in the space operations service the applicable general parameters of the application and licensing processes for those operations but seek comment on alternative approaches.

2. In-band Power Limits for Earth Stations Transmitting in the 399.9-400.05 MHz Band

16. We next propose to limit in-band power for earth stations operating in the mobile-satellite service (MSS) in the 399.9-400.05 MHz band, by adding references to footnotes 5.260A and 5.260B, to the Federal and non-Federal Tables of the U.S. Table, consistent with the *WRC-19 Final Acts*. This proposal would align the band with the maximum radiated power for mobile-satellite service use (except telecommand uplinks with the mobile-satellite service in the 400.02-400.05 MHz band) in the U.S., and

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state "for any specific earth station or typical mobile earth station in frequency bands above 100 MHz allocated with equal rights to space and terrestrial services, in respect of terrestrial stations, where the coordination area of the earth station includes the territory of another country, with the exception of the coordination under No. 9.15" and "for any transmitting station of a terrestrial service in the bands referred to in No. 9.17 within the coordination area of an earth station, in respect of this earth station, with the exception of the coordination under Nos. 9.16 and 9.19," respectively. *See* ITU Radio Regulations (Edition of 2020), Vol. 1, Article 9, Nos. 9.6, 9.17, and 9.18, at 198, 200, https://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.44.48.en.101.pdf (last visited Jan. 8, 2025).

[33] *See supra* note 23.

[34] *See In the Matter of Space Innovation; Facilitating Capabilities for in-Space Servicing, Assembly, & Mfg.*, 37 FCC Rcd 10022, para. 34 (2022) (*ISAM Notice*). *See also* 47 CFR § 2.1(c); ITU Radio Regulations, Edition of 2020, Vol. 1, No. 1.23 (defining the space operation service as "a radiocommunication service concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand"), at 9, https://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.44.48.en.101.pdf (last visited Jan. 8, 2025).

[35] *In the Matter of Streamlining Licensing Procs. for Small Satellites*, 34 F.C.C. Rcd. 13077, 13082 (2019).

[36] *See* 47 CFR Part 25, Satellite Communications (The Commission's Part 25 rules are the primary vehicle for satellite authorization and are used to license a wide range of satellite operations, including commercial communication and remote sensing satellites).

[37] *See* 47 CFR Part 5, Experimental Radio Service (Experimental operations, including experimental satellite operations, are scientific and research missions for the purposes of experimentation, product development, and market trials).

[38] *See* 47 CFR Part 97, Amateur Radio Service (The amateur-satellite service, as a subset of the amateur service, is reserved for communications made for the purpose of self-training, intercommunication between amateur stations, or technical investigations carried out by amateurs).

state dates for compliance, as described in the *WRC-19 Final Acts*.[39] Under the Commission's rules, the 399.9-400.05 MHz band is allocated to the mobile-satellite (Earth-to-space) and radionavigation-satellite services on a primary basis for Federal and non-Federal use.[40]

17. Footnote 5.260A states: (1) in the 399.9-400.05 MHz band, the maximum EIRP of any emission of MSS earth stations, and the maximum EIRP of each earth station, must not exceed 5 dBW in any 4 kilohertz band (5 dBW/4 kHz) and 5 dBW in the 150 kilohertz wide band (5 dBW/150 kHz); (2) until November 22, 2022, these limits do not apply to satellite systems with complete ITU notifications that were received by November 22, 2019; and (3) thereafter, these limits apply to all MSS systems operating in this band.[41] Footnote 5.260B states that, in the 400.02-400.05 MHz segment, the provisions of footnote 5.260A do not apply to MSS telecommand uplinks.[42] We request comment on the addition of these footnotes to the Federal and non-Federal U.S. Tables and whether we should consider elevation angles in establishing the maximum EIRP limit. We also seek comment on whether these power limits should be added to section 25.204 of the Commission's rules.

3. Global Maritime Distress Safety Systems Modernization

18. The following proposals would align the 1621.35-1626.5 MHz band in the U.S. Table with the *WRC-19 Final Acts* by adding a new allocation for the maritime mobile-satellite service (space-to-Earth) on a primary basis for Federal and non-Federal shared use subject to the conditions in four new international footnotes (5.208B, 5.370, 5.373, and 5.373A) added to the Federal and non-Federal Tables in 1621.35-1626.5 MHz portion of the 1613.8-1626.5 MHz band with the existing allocations and footnotes in the 1613.8-1626.5 MHz band.[43] Under the Commission's rules, the 1613.8-1626.5 MHz band is allocated to the mobile-satellite service (Earth-to-space), aeronautical radionavigation service, radiodetermination-satellite service (Earth-to-space), all on a primary basis for Federal and non-Federal use, and to the mobile-satellite service (space-to-Earth) on a secondary basis for Federal and non-Federal use.[44] These proposals are meant to provide additional satellite coverage to the Global Maritime Distress and Safety System (GMDSS) for use in the U.S.

19. As background, the GMDSS is an internationally recognized distress and radio communication safety system that has been in place for several decades.[45] The GMDSS is an automated ship-to-shore and ship-to-ship system using satellites and/or terrestrial radio systems with digital selective calling technology. The GMDSS systems provide safety-of-life information and communication systems that inform vessels of navigation hazards and weather conditions and enable distress calls with pertinent location and identification information with the push of a button. The GMDSS is mandated for ships internationally by the International Maritime Organization (IMO) Safety of Life at Sea Convention (SOLAS), 1974, as amended in 1988, which carries the force of an international treaty. The procedures

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[39] NTIA WRC-19 Implementation Recommendations, Annex 1.2, WRC-19 Agenda Item 1.2 (Power Limits for MSS/MetSat/EESS Earth Stations around 400 MHz), p. 3.

[40] 47 CFR § 2.106(a), (c)(320).

[41] 47 CFR § 2.106(b)(260)(i). We recognize that these compliance dates have passed and that the EIRP limits mentioned in 5.260A would apply to all MSS systems operating in the 399.9-400.05 MHz band (except MSS telecommand uplinks in the 400.02-400.05 MHz segment, as per 5.260B). 47 CFR § 2.106(b)(260)(ii).

[42] 47 CFR § 2.106(b)(260)(ii).

[43] NTIA WRC-19 Implementation Recommendations, Annex 1.8B, WRC-19 Agenda Item 1.8B (Global Maritime Distress Safety Systems (GMDSS) Modernization), at 14-15.

[44] 47 CFR § 2.106(a).

[45] *See* Global Maritime Distress and Safety System, https://www.fcc.gov/wireless/bureau-divisions/mobility-division/maritime-mobile/ship-radio-stations/global-maritime#:~:text=The%20GMDSS%20is%20an%20internationally,with%20digital%20selective%20calling%20technology.

governing GMDSS use are contained in the International Telecommunication Union's Radio Regulations and also carry the force of an international treaty.

20. We propose to split the existing 1613.8-1626.5 MHz band into two bands (1613.8-1621.35 MHz and 1621.35-1626.5 MHz) and add a primary maritime mobile-satellite service (space-to-Earth) allocation in the 1621.35-1626.5 MHz band for Federal and non-Federal use subject to the conditions in four new footnotes (5.208B, 5.370, 5.373, and 5.373A) added to the band. The existing allocations - primary mobile satellite service (Earth-to-space), aeronautical radionavigation, radiodetermination satellite (Earth-to-space), and secondary mobile-satellite (Earth-to-space) and footnotes (5.341, 5.364, 5.365, 5.366, 5.367, 5.368, and 5.372) in the 1613.8-1626.5 MHz band - would be retained in the 1613.8-1621.35 MHz and 1621.35-1626.5 MHz bands, while a primary maritime mobile-satellite allocation for Federal and non-Federal shared use, along with footnotes 5.208B, 5.370, 5.373, and 5.373A, would be added in the 1621.35-1626.5 MHz band.

21. We seek comment on the addition of a primary maritime mobile-satellite service (space-to-Earth) allocation to the 1621.35-1626.5 MHz band, subject to the conditions in footnotes 5.208B, 5.370, 5.373, and 5.373A.

22. Footnote 5.208B states that in the frequency bands 137-138 MHz, 157.1875-157.3375 MHz, 161.7875-161.9375 MHz, 387-390 MHz, 400.15-401 MHz, 1452-1492 MHz, 1525-1610 MHz, 1613.8-1626.5 MHz, 2655-2690 MHz, and 21.4-22 GHz, Resolution 739 (Rev.WRC-19) applies.[46] Resolution 739 recommends unwanted emissions limits to ensure that unwanted emissions from geostationary and non-geostationary space stations that are planned to operate in the mobile-satellite service (space-to-Earth) in the 1613.8-1626.5 MHz band are minimized in order to protect radio astronomy service stations in the 1610.6-1613.8 MHz band from harmful interference.[47]

23. Footnote 5.370 states that in Venezuela, the allocation to the radiodetermination-satellite service in the 1610-1626.5 MHz frequency band (Earth-to-space) is on a secondary basis.[48]

24. Footnote 5.373 states that "maritime mobile earth stations receiving in the 1621.35-1626.5 MHz band shall not impose additional constraints on earth stations operating in the maritime mobile-satellite service or maritime earth stations of the radiodetermination-satellite service operating in accordance with the Radio Regulations in the 1610-1621.35 MHz frequency band or on earth stations in the maritime mobile-satellite service operating in accordance with the Radio Regulations in the 1626.5-1660.5 MHz frequency band, unless otherwise agreed between the notifying administrations."[49]

25. Footnote 5.373A states that maritime mobile earth stations receiving in the 1621.35-1626.5 MHz frequency band shall not impose constraints on the assignment of earth stations in the mobile-satellite service (Earth-to-space) and the radiodetermination-satellite service (Earth-to-space) in the 1621.35-1626.5 MHz frequency band in networks for which complete coordination information has been received by the Radiocommunication Bureau before October 28, 2019.[50]

26. Further, we seek comment on whether updates are needed to the service-specific rules in Part 80 of the Commission's rules to implement a primary maritime mobile-satellite service (space-to-earth) allocation in the 1621.35-1626.5 MHZ Band. Additionally, we seek comment on whether any

[46] 47 CFR § 2.106(b)(208)(ii).

[47] Resolution 739 (Rev. WRC-19) – Compatibility between the radio astronomy service and the active space services in certain adjacent and nearby frequency bands, *WRC-19 Final Acts*, at 473-475. (https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.14-2019-PDF-E.pdf).

[48] 47 CFR § 2.106(b)(370).

[49] 47 CFR § 2.106(b)(373). In this case, Radiocommunication Bureau refers to the ITU Radiocommunication Bureau.

[50] 47 CFR § 2.106(b)(373)(i).

corresponding changes are needed to Part 25 of the Commission's rules to reflect this maritime mobile-satellite service (space-to-earth) allocation. Commenters should identify any rules that need to be amended and provide specific language to support their recommendations.

4. Earth Stations in Motion (ESIMs)

27. Our next proposal concerns the addition of footnote 5.517A to the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands of the U.S. Table. Footnote 5.517A states that "the operation of earth stations in motion (ESIMs) communicating with geostationary orbit fixed-satellite service (GSO FSS) space stations in the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands shall be subject to the application of Resolution 169 (WRC-23)," as described in the *WRC-23 Final Acts*, which contains the most up-to-date version of Resolution 169.[51] Resolution 169 provides conditions for ESIMs communicating with GSO FSS space stations in the 17.7-19.7 GHz and 27.5-29.5 GHz frequency bands, or parts thereof.[52] As background, ESIMs currently serve a wide range of applications – both on board various modes of transportation, such as aircraft and ships, and on land – by providing reliable and high-bandwidth connectivity capabilities to platforms in motion.[53] Advances in satellite manufacturing and earth station technology have made ESIMs more widespread and more practical. When ships are at sea or aircraft cross the oceans, they are out of reach of terrestrial networks. ESIM systems can provide continuous and consistent service with very wide, or literally global, geographic coverage as ships and aircraft operate at or over almost any location. To address the increasing need of ESIMs for radio-frequency spectrum, while protecting other and existing radio services, WRC-19 established certain regulatory and technical conditions under which the 17.7□19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands can be used by the three types of ESIMs communicating with geostationary space stations in the fixed-satellite service.[54]

28. Section 25.202(10)(ii) of the Commission's rules states the frequencies that are available for use by ESIMs communicating with GSO FSS space stations.[55] Under this portion of the Commission's rules, the 19.4-19.6 GHz, 27.5-28.35 GHz, and 29.1-29.25 GHz bands are not currently listed as available for ESIM operations, however, pursuant to section 25.202(b) operations are allowed

[51] *See* 47 CFR § 2.106(b)(517)(i). *See also* Resolution 169 (WRC-23) WRC-23 Final Acts, Use of the frequency bands 17.7-19.7 GHz and 27.5-29.5 GHz by earth stations in motion communicating with geostationary space stations in the fixed-satellite service, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.16-2024-PDF-E.pdf at 385-393.

[52] For example, use characteristics within the envelope characteristics of typical earth stations associated with the satellite network with which the ESIMs communicate; ESIMs shall not cause more interference and shall not claim more protection than for typical earth stations in the GSO FSS network; ESIMs shall not claim protection from broadcasting-satellite service feeder-link earth stations operating in the frequency band 17.7-18.4 GHz; receiving ESIMs in the frequency band 17.7-19.7 GHz band shall not claim protection from terrestrial services to which the frequency band is allocated and operating in accordance with the Radio Regulations; transmitting aeronautical and maritime ESIMs in the frequency band 27.5-29.5 GHz shall not cause interference to terrestrial services in neighboring countries to which the frequency band is allocated and operating in accordance with the Radio Regulations. Annex 1 to Resolution 169 includes provisions (e.g., maximum equivalent isotropically radiated power (EIRP) power spectral density (PSD) limits) for ESIMs' protection of non-GSO FSS systems in the frequency band 27.5-28.6 GHz. Annex 2 to Resolution 169 includes provisions (e.g., EIRP PSD limits) for ESIMs' protection of non-GSO mobile-satellite service feeder links in the frequency band 29.1-29.5 GHz. Annex 3 to Resolution 169 includes provisions for maritime (EIRP) and aeronautical (PFD, OOBE limits) ESIMs to protect terrestrial services in other countries in the frequency band 27.5-29.5 GHz. *See supra* fn. 51.

[53] Satellite issues: Earth stations in motion (ESIM), https://www.itu.int/en/mediacentre/backgrounders/Pages/Earth-stations-in-motion-satellite-issues.aspx (last visited Jan. 8, 2025).

[54] *Id*.

[55] 47 CFR § 25.202(a)(10)(ii) (subject to the provisions of 47 CFR 2.106).

outside of bands that are expressly listed in 25.202 on a case-by-case basis.[56] We also note that the Upper Microwave Flexible Use Service (UMFUS) is primary in the 27.5-28.35 GHz band and that earth stations in that band are subject to limits on the number of earth stations in a given area and the area within which the earth stations may operate without providing interference protection to UMFUS operations.[57] Point-to-point microwave licensed under part 101 of our rules and broadcast auxiliary services licensed under part 74 of our rules are also co-primary with FSS in the 17.7-18.3 GHz band.[58] Additionally, Resolution 169 prescribes off-axis power limits that differ from those adopted in the Commission's part 25 rules (i.e., Resolution 169 contains higher EIRP density limits, different off-axis angles, and specific frequency sub-bands in the conventional Ka-band for the off-axis EIRP of transmissions from ESIMs).[59] The implementation of Resolution 169 would therefore essentially subject ESIM operations in these bands to less restrictive limits than currently apply. We seek comment on whether to add footnote 5.517A to the 17.7-19.7 GHz and 27.5-29.5 GHz bands and on whether this would be consistent with current Commission rules regarding ESIM operations

5. Earth Stations Transmitting in the 49.7-50.2 GHz and 50.4-50.9 GHz Bands

29. In this section, we propose an update to our rules to further develop the regulatory framework for NGSO FSS systems. We specifically propose to modify US156 of the Commission's rules to reflect WRC-19's revision of the limits for unwanted emissions in the 50.2-50.4 GHz passive band (200-megahertz passive band or passive band) from earth stations in the fixed-satellite service (Earth-to-space) that transmit in the 49.7-50.2 GHz and 50.4-50.9 GHz bands. Footnote US156 currently states that in the bands 49.7-50.2 GHz and 50.4-50.9 GHz, for earth stations in the fixed-satellite service (Earth-to-space), the unwanted emissions power in the band 50.2-50.4 GHz shall not exceed −20 dBW/200 MHz (measured at the input of the antenna), except that the maximum unwanted emissions power may be increased to −10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57 dBi. These limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control.[60]

30. First, we propose to modify US156 to state that, for NGSO earth stations brought into use on or after January 1, 2021, that transmit to space stations in non-geostationary-satellite orbits, unwanted emission power shall not exceed −42 dBW in the 200 megahertz passive band (i.e., −42 dBW/200 MHz in the 50.2-50.4 GHz passive band) for NGSO earth stations not employing uplink power control, and −42 dBW/200 MHz in the passive band at zenith (i.e., at an elevation angle of 90°) increasing [linearly] to a maximum level of −35 dBW/200 MHz in the passive band at a minimum elevation angle of 15° for NGSO earth stations employing uplink power control.

31. Next, for GSO earth stations brought into use on or after January 1, 2024, that transmit to space stations in the geostationary satellite orbit, we propose to require that the unwanted emission power shall not exceed −45 dBW/200 MHz in the passive band for GSO earth stations having an elevation angle equal to or above 80°; −30 dBW/200 MHz in the passive band for GSO earth stations having an elevation angle below 80° and an antenna gain less than 57 dBi; and −25 dBW/200 MHz in the passive band for GSO earth stations having an elevation angle below 80° and an antenna gain greater than or equal to 57 dBi.

32. Lastly, for NGSO earth stations brought into use prior to January 1, 2021 or GSO earth stations brought into use prior to January 1, 2024, we propose that unwanted emissions in the 50.2-50.4

[56] 47 CFR § 25.202(b).

[57] *See* 47 CFR § 25.136.

[58] *See* 47 CFR §§ 74.602(g), 101.101.

[59] *See supra* note 52. *See also* 47 CFR § 25.218.

[60] 47 CFR § 2.106(c)(156).

GHz band shall not exceed −20 dBW/200 MHz, except that the maximum unwanted emissions power may be increased to −10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57dBi. The above limits would apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink control. We request comment on these proposed updates and whether any corresponding updates to our part 25 rules are necessary to implement these proposals. Additionally, given that the compliance dates mentioned above have passed, we seek comment on whether the Commission should update these dates, along with how any issues associated with grandfathering should be addressed given that earth stations authorized before the proposed dates would be subjected to less restrictive power limits.

B. Terrestrial Issues

1. International Navigational Data (NAVDAT) System in the 435-472 kHz and 479-510 kHz Bands

33. We propose to make the 495-505 kHz band (i.e., the 10 kilohertz band centered on the frequency 500 kHz) available for digital broadcasting of maritime safety and security related information from shore-to-ship, i.e., the international Navigational Data (NAVDAT) system, by adding a reference to footnote 5.82C in the 495-505 kHz band in the non-Federal portion of the U.S. Table.[61] We also propose to revise footnote US79A, which we added in the *WRC-19 Administrative Order* to reflect the pre-WRC-19 conditions in footnote 5.79 in the U.S. Table, by updating its text to generally reflect WRC-19's changes to footnote 5.79.[62] WRC-19 revised footnote 5.79 by expanding the permitted uses of the maritime mobile service in the 415-495 kHz and 505-526.5 kHz (505-510 kHz in Region 2) bands from radiotelegraphy by stating that this spectrum "may also be used for the NAVDAT system in accordance with the most recent version of Recommendation ITU-R M.2010, subject to agreement between interested and affected administrations. NAVDAT transmitting stations are limited to coast stations." In addition, WRC-19 expanded this footnote's applicability in Region 2 from 505-510 kHz to 505-526.5 kHz.[63]

34. The 495-505 kHz band is allocated exclusively to the maritime mobile service on a primary basis in all ITU Regions and under the Commission's rules, in the U.S. Table, where the band is allocated for Federal/non-Federal shared use.[64] WRC-19 adopted footnote 5.82C, which states that the 495-505 kHz band is used for the international NAVDAT system as described in the most recent version of Recommendation ITU-R M.2010 and that NAVDAT transmitting stations are limited to coast stations.[65] As discussed in ITU-R Report M.2201, the 495-505 kHz band is lightly used and thus available for use by the NAVDAT system, and its coverage range matches the coverage provided by the existing Navigational Telex (NAVTEX) system operating at 490 kHz and 518 kHz.[66] The NAVDAT

(Continued from previous page)

[61] NTIA WRC-19 Implementation Recommendations, Annex 1.8A, WRC-19 Agenda Item 1.8A (NAVDAT), p. 13.

[62] *See WRC-19 Administrative* Order, at para. 11.

[63] *See WRC-19 Final Acts* Article 5 Frequency allocations, at 4, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.14-2019-PDF-E.pdf. *See also* ITU Radio Regulations, Edition of 2016, Article 5, 5.79, at 49, https://search.itu.int/history/HistoryDigitalCollectionDocLibrary/1.43.48.en.101.pdf.

[64] 47 CFR § 2.106(a).

[65] *See WRC-19 Final Acts* Article 5 Frequency allocations, at 4, https://www.itu.int/dms_pub/itu-r/opb/act/R-ACT-WRC.14-2019-PDF-E.pdf. *See* ITU-R Recommendation M.2010-2 (02/2023): *Characteristics of a digital system, named Navigational Data for broadcasting maritime safety and security related information from shore-to-ship in the 500 kHz band*, https://www.itu.int/rec/R-REC-M.2010/en.

[66] *See* ITU-R Report M.2201-0 (11/2010), Utilization of the 495-505 kHz band by the maritime mobile service for the digital broadcasting of safety and security related information from shore-to-ships, at 25, Conclusions, https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2201-2010-PDF-E.pdf. For the Coast Guard's NAVTEX webpage, see https://www.navcen.uscg.gov/?pageName=NAVTEX. We note that, in 2019, the Coast Guard stated

(continued….)

system would provide a greatly improved data throughput from that currently provided by the NAVTEX system and also would provide protection to the NAVTEX system.[67]

35. Under the Commission's rules, in the U.S. Table, the 435-472 kHz, 479-495 kHz, and 505-510 kHz bands are allocated to the maritime mobile service on a primary basis for Federal/non-Federal shared use and footnote US79A applies.[68] We tentatively find that the text of footnote US79A should be replaced by the text of footnote 5.79, except that the frequency bands that are not currently authorized in the U.S. Table (the 472-479 kHz and 510-526.5 kHz bands are not allocated for the maritime mobile service) should not be listed. Together, these proposals would make the 435-472 kHz and 479-510 kHz bands available to the international NAVDAT system. Footnote 5.82C would make the 495-505 kHz band available for use by the international NAVDAT system as described in ITU-R M.2010 and limit NAVDAT transmitting stations to coast stations. We request comment on these proposals.

36. Lastly, the implementation of the NAVDAT system would require service-specific rules to be added to Part 80 of the Commission's rules. Given the nascency of the NAVDAT system, it is premature to propose service-specific rules at this time. The Commission may propose rules for the NAVDAT system at a later date, as the domestic standards are developed.

2. Table Mountain Radio Quiet Zone Field Strength Limit

37. We seek comment on a proposal from NTIA's Institute for Telecommunications Sciences (ITS) to make several modifications to the Table Mountain Radio Quiet Zone field strength limit in the Commission's rules.[69] As background, the Table Mountain Field Site (TMFS) is designated in the Commission's rules[70] and in the NTIA Manual[71] as a "Radio Quiet Zone." Federal and State regulations protect the TMFS from strong external radio signals. Applicants intending to operate a new or modified station at a permanent fixed location in the vicinity of Boulder County, Colorado are advised to give consideration, prior to filing applications, to the necessity of protecting the Table Mountain Radio Receiving Zone from interference. This rule enables the Department of Commerce laboratories and research affiliates to study the characteristics and propagation of electromagnetic radiation, and of spectrum coexistence between new and legacy (incumbent) radio systems, in a real-world, open-air environment with minimal interference from uncontrolled sources of external radio interference. NTIA's ITS laboratory manages the Quiet Zone's radio frequency (RF) environment, which includes monitoring interference and overseeing incident-signal power level compliance.[72]

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that it may cease broadcasting NAVTEX over 518 kHz after first ensuring the information contained in NAVTEX broadcasts is available via International Maritime Organization (IMO) recognized satellite services. See https://www.federalregister.gov/documents/2019/09/11/2019-19675/proposed-termination-of-us-coast-guard-medium-frequency-mf-broadcast-of-navigational-telex-navtex.

[67] *See* ITU-R Report M.2201-0 (11/2010), Utilization of the 495-505 kHz band by the maritime mobile service for the digital broadcasting of safety and security related information from shore-to-ships, at 25, Conclusions,https://www.itu.int/dms_pub/itu-r/opb/rep/R-REP-M.2201-2010-PDF-E.pdf. For additional information, see the CPM-19 Report, agenda item 1.8, at 726-755.

[68] 47 CFR § 2.106(a), (c)(79)(iii).

[69] NTIA Table Mountain Letter to FCC reference Quiet Zones; e-mail from Charles Cooper, Associate Administrator, Office of Spectrum Management, NTIA, to Ronald Repasi, Chief, FCC Office of Engineering and Technology, dated July 18, 2024, (*NTIA Table Mountain Letter*) https://www.fcc.gov/ecfs/search/search-filings/filing/107180694517066.

[70] *See* 47 CFR § 1.924(b).

[71] NTIA Manual Chapter 8.3.20.

[72] *See* National Telecommunications and Information Administration United States Department of Commerce ITS: The Nation's Spectrum and Communications Lab, https://www.ntia.gov/office/its-nation-s-spectrum-and-communications-lab.

38. Section 1.924 of the Commission's rules states that the Department of Commerce seeks to ensure that the field strengths of any radiated signals received in the vicinity of the Table Mountain Radio Quiet Zone near Boulder, Colorado do not exceed the limits given in the section's table, entitled "Field Strength Limits for Table Mountain."[73] At and above 890 MHz, that limit is one millivolt per meter (1 mV/m). According to NTIA, although a fixed-level limit, irrespective of radio frequency, might appear reasonable at first glance, there is a technical problem with such a fixed field-strength limit: when radio signals are held at that limit, their power coupled into receiver circuits gradually decreases for a given, fixed receive-antenna gain. Received power, for a fixed field strength limit, decreases in a receiver with a fixed-gain antenna by a factor of four for every doubling of frequency.[74] This rapid decrease with increasing frequency becomes so severe at millimeter-wave frequencies (an area of currently expanding research and industrial-commercial development) that incident radio signals at the field strength limit eventually go below the room-temperature thermal noise limit of receiving antennas, receiver circuits, scientific electronic instrumentation, and all other room temperature objects including even human bodies. The problem occurs because of a technical artifact: the definition of the effective aperture (the electronic "size") of a theoretical construction called an isotropic antenna.[75]

39. To address the issue at the TMFS, NTIA requests several modifications to the Table Mountain Quiet Zone field strength rules found in section 1.924. Specifically, NTIA requests that we amend the rules to limit the field strength at the Quiet Zone by modifying the field strength limit for microwave frequencies at and above 15.7 GHz, increasing the new limit at the same rate that the effective aperture of an isotropic antenna changes, and changing the current total signal power criterion to a per megahertz basis.

40. First, we seek comment on modifying the field strength limits for frequency ranges at and above 15.7 GHz. NTIA suggests its proposed adjustment begin at 15.7 GHz based on an analysis that determined 15.7 GHz is the bottom edge of the nearest allocated frequency band[76] to the frequency where the signal-to-noise ratio (SNR) of an incident signal at the Table Mountain Quiet Zone limit, received with an isotropic (0 dBi gain) antenna in a sensitive receiver,[77] is 10 dB in a 1 megahertz bandwidth. Is this rationale sufficient to support modifying the field strength and power flux density limits for frequency ranges above 15.7 GHz? Should the Commission consider an alternative starting point at a higher frequency for the new field strength limit? We request that commenters include technical support for the Commission's consideration.

41. Second, we seek comment on NTIA's suggestion to linearly increase the field strength limits and logarithmically increase the power flux density (PFD) limits with the transmit frequency above 15.7 GHz (see Table 1 below). Should the Commission consider alternative methods for calculating the new field strength and power flux density limits? Commenters suggesting an alternative method should provide technical justification for their preferred method.

42. Third, we seek comment on defining the new field strength and power flux density limits above 15.7 GHz on a per megahertz basis instead of the current total field strength or power flux density criterion.[78] The Commission has traditionally defined field strength limits without a reference channel bandwidth in several rule parts, including for 800 MHz cellular systems along the Cellular Geographic

[73] 47 CFR § 1.924(b)(1).

[74] *NTIA Table Mountain Letter*, Appx. A, at A-1.

[75] *Id*.

[76] The calculated frequency that exactly meets the stated requirement is 15 480 MHz. The nearest US spectrum allocation band edge is 15 700 MHz = 15.7 GHz.

[77] A sensitive receiver is considered to be a receiver with a 3 dB noise figure.

[78] *See NTIA Table Mountain Letter*, Appx. A, at A-7.

Service Area (CGSA) boundary (40 dBuV/m)[79] and 1.9 GHz PCS systems at the border of the PCS service area (47 dBuV/m).[80] Similarly, the Advanced Wireless Service (AWS) rules specify a field strength limit without reference to channel bandwidth.[81] In a more recent proceeding for the Upper Microwave Flexible Use Service (UMFUS), the Commission adopted a power flux density limit on a per megahertz basis for base stations operating in the 27.5-28.35 GHz band and 37-40 GHz band.[82] During the UMFUS proceeding, the Commission sought comment on whether it should adopt a 47dBuV/m field strength limit, a -86dBm/m^2/MHz PFD limit, or any alternative limit at the market boundary. The Commission adopted the PFD limit on a per megahertz basis with overwhelming support from commenters and noted that a scaling factor should be considered given the wide channel bandwidths and diversity of potential UMFUS applications.[83] We seek comment on whether defining the field strength or power flux density limit on a per megahertz basis as requested by NTIA includes a sufficient scaling factor for the wider channel bandwidths of current and planned services that may be deployed above 15.7 GHz. Commenters are encouraged to provide technical justification for the channel bandwidth scaling factor or different field strength/PFD limits and explain any material differences regarding assumptions used to derive their preferred field strength/PFD limit.

43. Finally, we seek general comment on whether a similar technical argument for adjusting the field strength limit in the Table Mountain Radio Quiet Zone should be considered for extremely high operating frequencies, such as above 1 terahertz. Commenters are encouraged to provide technical justification for designating any additional frequency break points (such as algorithmic support for a revised field strength limit) as well as the appropriate reference to signal bandwidth for compliance.

TABLE 1

FIELD STRENGTH LIMITS FOR TABLE MOUNTAIN PER NTIA PROPOSAL[84]

Frequency range	Field strength (mV/m)	Power flux density (dBW/m^2)
Below 540 kHz	10	−65.8
540 to 1600 kHz	20	−59.8
1.6 to 470 MHz	10	−65.8
470 to 890 MHz	30	−56.2
890 MHz to 15.7 GHz	1	−85.8

Frequency range	Field strength (mV/m/MHz) of authorized signal bandwidth	Power flux density (dBW/m^2) per MHz of authorized signal bandwidth
Above 15.7 GHz	(1 millivolt/meter/ megahertz) ·	-85.8 + (20·log(f/15.7))*

[79] 47 CFR § 32.983.

[80] 47 CFR § 24.236.

[81] 47 CFR § 27.55(a).

[82] 47 CFR § 30.204(a).

[83] *Use of Spectrum Bands Above 24 GHz For Mobile Radio Services, et al*., Report and Order and Further Notice of Proposed Rulemaking, 31 FCC Rcd at 8122-23, paras. 310-12 (2016).

[84] NTIA notes that the equivalent values of power flux density are calculated assuming free space characteristic impedance of 376.7Ω (120πΩ). Additionally, under the proposed formula for measurement, *f* is the center frequency of the signal in gigahertz. *NTIA Table Mountain Letter*, Appx. B, at B-1, n.1.

	(f/15.7) *	

[1] NOTE: Equivalent values of power flux density are calculated assuming free space characteristic impedance of 376.7Ω (120πΩ).

* The variable *f* is the center frequency of the signal in gigahertz.

IV. PROCEDURAL MATTERS

44. *Regulatory Flexibility Act*. The Regulatory Flexibility Act of 1980, as amended (RFA),[85] 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."[86] Accordingly, the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) concerning the possible/potential impact of the rule and policy changes contained in this *Notice of Proposed Rulemaking*. The IRFA is set forth in Appendix B. The Commission invites the general public, particularly small businesses, to comment on the IRFA. Comments must be filed by the deadlines for comments on the *Notice of Proposed Rulemaking* indicated on the first page of this document and must have a separate and distinct heading designating them as responses to the IRFA.

45. *Paperwork Reduction Act*. This *Notice of Proposed Rulemaking* may contain proposed new and revised information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and the Office of Management and Budget (OMB) to comment on the information collection requirements contained in this document, as required by the Paperwork Reduction Act of 1995, Public Law 104-13. In addition, pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107-198, *see* 44 U.S.C § 3506(c)(4), we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.

46. *Providing Accountability Through Transparency Act*. Consistent with the Providing Accountability Through Transparency Act, Public Law 118-9, a summary of this document will be available on https://www.fcc.gov/proposed-rulemakings.

47. *Ex Parte Presentations—Permit-But-Disclose.* The proceeding this *Notice of Proposed Rulemaking* initiates shall be treated as a "permit-but-disclose" proceeding in accordance with the Commission's *ex parte* rules.[87] Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter's written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them

[85] 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601–612, was amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[86] 5 U.S.C. § 605(b).

[87] 47 CFR §§ 1.1200 *et seq.*

in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with section 1.1206(b) of the Commission's rules. In proceedings governed by section 1.49(f) of the Commission's rules or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (*e.g.*, .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize themselves with the Commission's *ex parte* rules.[88]

48. *Comment Filing Procedures*. Pursuant to sections 1.415 and 1.419 of the Commission's rules, 47 CFR §§ 1.415, 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document. Comments may be filed using the Commission's Electronic Comment Filing System (ECFS).

- Electronic Filers: Comments may be filed electronically using the Internet by accessing the ECFS: https://www.fcc.gov/ecfs/.
- Paper Filers: Parties who choose to file by paper must file an original and one copy of each filing.
- Filings can be sent by hand or messenger delivery, by commercial courier, or by the U.S. Postal Service. **All filings must be addressed to the Secretary, Federal Communications Commission.**
- Hand-delivered or messenger-delivered paper filings for the Commission's Secretary are accepted between 8:00 a.m. and 4:00 p.m. by the FCC's mailing contractor at 9050 Junction Drive, Annapolis Junction, MD 20701. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.
- Commercial courier deliveries (any deliveries not by the U.S. Postal Service) must be sent to 9050 Junction Drive, Annapolis Junction, MD 20701.
- Filings sent by U.S. Postal Service First-Class Mail, Priority Mail, and Priority Mail Express must be sent to 45 L Street NE, Washington, DC 20554.

49. *Accessible Formats*. To request materials in accessible formats for people with disabilities (Braille, large print, electronic files, audio format), send an e-mail to fcc504@fcc.gov or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice).

50. *Additional Information*. For further information about the *Notice of Proposed Rulemaking*, contact Sebastian Garcia, Office of Engineering and Technology, Sebastian.garcia@fcc.gov , (202) 418-2932.

V. ORDERING CLAUSES

51. IT IS ORDERED that, pursuant to sections 1, 4(i), 4(j), 7, 301, 303(c), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 157, 301, 303(c), 303(f), and 303(r), this Notice of Proposed Rulemaking IS ADOPTED.[89]

[88] *Id.* § 1.49(f).

[89] Pursuant to Executive Order 14215, 90 Fed. Reg. 10447 (Feb. 20, 2025), this regulatory action has been determined to be not significant under Executive Order 12866, 58 Fed. Reg. 68708 (Dec. 28, 1993).

52. IT IS FURTHER ORDERED that the Commission's Office of Secretary, SHALL SEND a copy of this Notice of Proposed Rule Making, including the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

FEDERAL COMMUNICATIONS COMMISSION

Marlene H. Dortch
Secretary

APPENDIX A

Proposed Rules

The Federal Communications Commission proposes to amend 47 CFR part 2 as follows:

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

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

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

4. Amend section 2.106 by revising paragraph (a) U.S. Table of Frequency Allocations pages 4, 21, 22, 26, 34 to read as follows:

§ 2.106 Table of Frequency Allocations.

(a) * * *

* * * * *

435-472 MARITIME MOBILE 5.79 Aeronautical radionavigation 5.77 5.82	5.78 5.82		435-472 MARITIME MOBILE US79A Aeronautical radionavigation 5.82 US2 US231	435-472 MARITIME MOBILE US79A 5.82 US2 US231	
472-479 MARITIME MOBILE 5.79 Amateur 5.80A Aeronautical radionavigation 5.77 5.80 5.80B 5.82			472-479 US2	472-479 Amateur 5.80A 5.82 US2 NG8	Amateur Radio (97)
479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.82	479-495 MARITIME MOBILE 5.79 5.79A Aeronautical radionavigation 5.77 5.80 5.82		479-495 MARITIME MOBILE US79A 5.79A Aeronautical radionavigation 5.82 US2 US231	479-495 MARITIME MOBILE US79A 5.79A 5.82 US2 US231	Maritime (80)
495-505 MARITIME MOBILE 5.82C			495-505 MARITIME MOBILE 5.82C		Maritime (80) Aviation (87)
505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION	505-510 MARITIME MOBILE 5.79	505-526.5 MARITIME MOBILE 5.79 5.79A 5.84 AERONAUTICAL RADIONAVIGATION Aeronautical mobile Land mobile	505-510 MARITIME MOBILE US79A		Maritime (80)
	510-525 MARITIME MOBILE 5.79A 5.84 AERONAUTICAL RADIONAVIGATION		510-525 MARITIME MOBILE (ships only) 5.79A 5.84 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 US14 US225		Maritime (80) Aviation (87)
526.5-1606.5 BROADCASTING	525-535 BROADCASTING 5.86 AERONAUTICAL RADIONAVIGATION	526.5-535 BROADCASTING Mobile 5.88	525-535 MOBILE US221 AERONAUTICAL RADIONAVIGATION (radiobeacons) US18 US239		Aviation (87) Private Land Mobile (90)
5.87 5.87A	535-1605 BROADCASTING	535-1606.5 BROADCASTING	535-1605	535-1605 BROADCASTING NG1 NG5	Radio Broadcast (AM)(73) Private Land Mobile (90)
1606.5-1625 FIXED MARITIME MOBILE 5.90 LAND MOBILE 5.92	1605-1625 BROADCASTING 5.89 5.90	1606.5-1800 FIXED MOBILE RADIOLOCATION RADIONAVIGATION	1605-1615 MOBILE US221 G127 1615-1705 US299	1605-1705 BROADCASTING 5.89 US299 NG1 NG5	Radio Broadcast (AM)(73) Alaska Fixed (80) Private Land Mobile (90)
1625-1635 RADIOLOCATION 5.93	1625-1705 FIXED MOBILE BROADCASTING 5.89 Radiolocation				
1635-1800 FIXED MARITIME MOBILE 5.90	5.90				

LAND MOBILE 5.92 5.96	1705-1800 FIXED MOBILE RADIOLOCATION AERONAUTICAL RADIONAVIGATION	5.91	1705-1800 FIXED MOBILE RADIOLOCATION US240	Alaska Fixed (80) Private Land Mobile (90) Page 4

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Table of Frequency Allocations 117.975-150.8 MHz (VHF) Page 21

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
117.975-137 AERONAUTICAL MOBILE (R) 5.111 5.200 5.201 5.202			117.975-121.9375 AERONAUTICAL MOBILE (R) 5.111 5.200 US26 US28 US36		Aviation (87)
			121.9375-123.0875 US30 US31 US33 US80 US102 US213	121.9375-123.0875 AERONAUTICAL MOBILE US30 US31 US33 US80 US102 US213	
			123.0875-123.5875 AERONAUTICAL MOBILE 5.200 US32 US33 US112		
			123.5875-128.8125 AERONAUTICAL MOBILE (R) US26 US36		
			128.8125-132.0125	128.8125-132.0125 AERONAUTICAL MOBILE (R)	
			132.0125-136 AERONAUTICAL MOBILE (R) US26		
			136-137 US244	136-137 AERONAUTICAL MOBILE (R) US244	
137-137.025 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137-137.025 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208		Satellite Communications (25)
137.025-137.175 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209			137.025-137.175 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320		

5.204 5.205 5.206 5.207 5.208			5.208		
137.175-137.825 SPACE OPERATION (space-to-Earth) 5.203C 5.209A METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208A 5.208B 5.209 SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) 5.204 5.205 5.206 5.207 5.208			137.175-137.825 SPACE OPERATION (space-to-Earth) 5.203C 5.209A METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) US319 US320 SPACE RESEARCH (space-to-Earth) 5.208		
137.825-138 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Fixed Mobile except aeronautical mobile (R) Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.209 5.204 5.205 5.206 5.207 5.208			137.825-138 SPACE OPERATION (space-to-Earth) 5.203C METEOROLOGICAL-SATELLITE (space-to-Earth) SPACE RESEARCH (space-to-Earth) Mobile-satellite (space-to-Earth) US319 US320 5.208		
138-143.6 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	138-143.6 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	138-143.6 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	138-144 FIXED MOBILE	138-144	
143.6-143.65 AERONAUTICAL MOBILE (OR) SPACE RESEARCH (space-to-Earth) 5.211 5.212 5.214	143.6-143.65 FIXED MOBILE RADIOLOCATION SPACE RESEARCH (space-to-Earth)	143.6-143.65 FIXED MOBILE SPACE RESEARCH (space-to-Earth) 5.207 5.213			
143.65-144 AERONAUTICAL MOBILE (OR) 5.210 5.211 5.212 5.214	143.65-144 FIXED MOBILE RADIOLOCATION Space research (space-to-Earth)	143.65-144 FIXED MOBILE Space research (space-to-Earth) 5.207 5.213	G30		
144-146 AMATEUR AMATEUR-SATELLITE 5.216			144-148	144-146 AMATEUR AMATEUR-SATELLITE	Amateur Radio (97)
146-148 FIXED MOBILE except aeronautical mobile (R)	146-148 AMATEUR 5.217	146-148 AMATEUR FIXED MOBILE 5.217		146-148 AMATEUR	

148-149.9 FIXED MOBILE except aeronautical mobile (R) MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.218A 5.219 5.221	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) 5.209 5.218 5.218A 5.219 5.221	148-149.9 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space) US319 US320 US323 US325 5.218 5.218A 5.219 G30	148-149.9 MOBILE-SATELLITE (Earth-to-space) US320 US323 US325 5.218 5.218A 5.219 US319	Satellite Communications (25)
149.9-150.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220		149.9-150.05 MOBILE-SATELLITE (Earth-to-space) US319 US320 RADIONAVIGATION-SATELLITE		
150.05-153 FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY 5.149	150.05-154 FIXED MOBILE 5.225	150.05-150.8 FIXED MOBILE US73 G30	150.05-150.8 US73	Page 22

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235-267 FIXED MOBILE 5.111 5.252 5.254 5.256 5.256A	235-267 FIXED MOBILE 5.111 5.256 G27 G100	235-267 5.111 5.256	
267-272 FIXED MOBILE Space operation (space-to-Earth) 5.254 5.257	267-322 FIXED MOBILE	267-322	
272-273 SPACE OPERATION (space-to-Earth) FIXED MOBILE 5.254			
273-312 FIXED MOBILE 5.254			
312-315 FIXED MOBILE Mobile-satellite (Earth-to-space) 5.254 5.255			
315-322 FIXED MOBILE 5.254	G27 G100		

322-328.6 FIXED MOBILE RADIO ASTRONOMY 5.149	322-328.6 FIXED MOBILE US342 G27	322-328.6 US342	
328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258 5.259	328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258		Aviation (87)
335.4-387 FIXED MOBILE 5.254	335.4-399.9 FIXED MOBILE	335.4-399.9	
387-390 FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.254 5.255			
390-399.9 FIXED MOBILE 5.254	G27 G100		
399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220 5.260A 5.260B	399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.260A 5.260B US320 RADIONAVIGATION-SATELLITE		Satellite Communications (25) Page 26

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1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile except aeronautical mobile 5.341 5.342 5.351 5.354	1530-1535 SPACE OPERATION (space-to-Earth) MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.353A Earth exploration-satellite Fixed Mobile 5.343 5.341 5.351 5.354		5.341 5.351	
1535-1559 MOBILE-SATELLITE (space-to-Earth) 5.208B 5.351A 5.341 5.351 5.353A 5.354 5.355 5.356 5.357 5.357A 5.359 5.362A			1535-1559 MOBILE-SATELLITE (space-to-Earth) US308 US309 US315 US380 5.341 5.351 5.356	Satellite Communications (25) Maritime (80) Aviation (87)
1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth) (space-to-space) 5.208B 5.328B 5.329A 5.341			1559-1610 AERONAUTICAL RADIONAVIGATION RADIONAVIGATION-SATELLITE (space-to-Earth)(space-to-space) 5.341 US85 US208 US260	Aviation (87)
1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.371 5.372	1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351AAERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.370 5.372	1610-1610.6 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610-1610.6 MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.372 US208	Satellite Communications (25) Maritime (80) Aviation (87)

1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION 5.149 5.341 5.355 5.359 5.364 5.3665.367 5.368 5.369 5.371 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) 5.149 5.341 5.364 5.366 5.367 5.3685.370 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) 5.351A RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION Radiodetermination-satellite (Earth-to-space) 5.149 5.341 5.355 5.359 5.364 5.366 5.367 5.368 5.369 5.372	1610.6-1613.8 MOBILE-SATELLITE (Earth-to-space) US319 US380 RADIO ASTRONOMY AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) 5.341 5.364 5.366 5.367 5.368 5.372 US208 US342	
1613.8-1621.35 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.364 5.365 5.3665.367 5.368 5.369 5.371 5.372	1613.8-1621.35 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.3685.370 5.372	1613.8-1621.35 MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) 5.208B Radiodetermination-satellite (Earth-to-space) 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	1613.8-1621.35 MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) 5.341 5.364 5.365 5.366 5.367 5.368 5.372 US208	
1621.35-1626.5 MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) except maritime mobile-satellite (space-to-Earth) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.371 5.372	1621.35-1626.5 MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) except maritime mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	1621.35-1626.5 MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A MOBILE-SATELLITE (Earth-to-space) 5.351A AERONAUTICAL RADIONAVIGATION Mobile-satellite (space-to-Earth) except maritime mobile-satellite (space-to-Earth) Radiodetermination-satellite (Earth-to-space) 5.208B 5.341 5.355 5.359 5.364 5.365 5.366 5.367 5.368 5.369 5.372	1621.35-1626.5 MARITIME MOBILE-SATELLITE (space-to-Earth) 5.373 5.373A MOBILE-SATELLITE (Earth-to-space) US319 US380 AERONAUTICAL RADIONAVIGATION US260 RADIODETERMINATION-SATELLITE (Earth-to-space) Mobile-satellite (space-to-Earth) except maritime mobile-satellite (space-to-Earth) 5.208B 5.341 5.364 5.365 5.366 5.367 5.368 5.370 5.372	Page 34

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5. Revise § 2.106 by revising paragraphs (c)(79)(iii) and (c)(156) to read as follows:

(c) * * *

* * * * *

(79) * * *

(iii) US79A The use of the bands 415-472 kHz, 479-495 kHz, and 505-510 kHz by the maritime mobile service is limited to radiotelegraphy and may also be used for the NAVDAT system in accordance with the most recent version of Recommendation ITU-R M.2010, subject to agreement between interested and affected administrations. NAVDAT transmitting stations are limited to coast stations.

* * * * *

(156) In the bands 49.7-50.2 GHz and 50.4-50.9 GHz, for earth stations in the fixed-satellite service (Earth-to-space), the following limits shall apply to unwanted emissions power (measured at the input of the antenna) in the band 50.2-50.4 GHz:

(a) For NGSO earth stations brought into use prior to 1 January 2021 or GSO earth stations brought into use prior to 1 January 2024: emissions shall not exceed −20 dBW/200 MHz, except that the maximum unwanted emissions power may be increased to −10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57 dBi.

(b) For NGSO earth stations brought into use on or after 1 January 2021: emissions shall not exceed −42 dBW/200MHz, except that stations employing uplink power control (free-space path loss compensation) may increase maximum unwanted emissions power from −42 dBW/200MHz at zenith to a maximum level of −35 dBW/200MHz at a minimum elevation angle of 15°.

(c) For GSO earth stations brought into use on or after 1 January 2024: emissions shall not exceed −45 dBW/200MHz, except that (i) the maximum unwanted emissions power may be increased to −30 dBW/200 MHz for earth stations having an antenna gain less than 57 dBi and an elevation angle below 80° or (ii) the maximum unwanted emissions power may be increased to −25 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57 dBi and an elevation angle below 80°.

(d) These limits apply under clear-sky conditions. During fading conditions, the limits may be exceeded by earth stations when using uplink power control.

* * * * *

APPENDIX B

Initial Regulatory Flexibility Analysis

1. As required by the Regulatory Flexibility Act of 1980, as amended (RFA),[1] the Federal Communications Commission (Commission) has prepared this Initial Regulatory Flexibility Analysis (IRFA) of the possible significant economic impact on a substantial number of small entities by the policies and rules proposed in the *Notice of Proposed Rulemaking* (*WRC-19 Notice*). Written public comments are requested on this IRFA. Comments must be identified as responses to the IRFA and must be filed by the deadlines for comments provided in the *WRC-19 Notice*. The Commission will send a copy of the *WRC-19 Notice*, including this IRFA, to the Chief Counsel for Advocacy of the Small Business Administration (SBA).[2] In addition, the *WRC-19 Notice* and IRFA (or summaries thereof) will be published in the *Federal Register*.[3]

A. Need for, and Objectives of, the Proposed Rules

2. The Commission initiates the *WRC-19 Notice*, and proposes to implement in the Commission's rules certain WRC-19 radiofrequency (RF) allocation decisions not previously addressed. We propose to amend part 2 of the Commission's rules to implement certain WRC-19 allocation decisions and technical operating parameters updates, seek comment on the need to make associated rule changes in parts 25 and 80 of the rules (e.g., application, licensing, and service rules), and seek comment on making other rule changes that are not related to WRC-19 implementation. Specifically, we propose changes that address satellite issues, followed by terrestrial issues, such as: 1) adding a space operation service allocation in the bands 137-138 MHz (space-to-Earth) and 148-149.9 MHz (Earth-to-space) to make these bands available for use by space stations in non-geostationary satellite orbits (NGSOs) with short-duration mission systems; 2) adopting power limits for earth stations in the mobile-satellite service that transmit in the 399.9-400.05 MHz band, except for telecommand uplinks with the mobile-satellite service in the 400.02-400.05 MHz band; 3) allocating the 1621.35-1626.5 MHz band to the maritime mobile-satellite service (space-to-Earth) on a primary basis for Federal and non-Federal shared use while also preventing maritime mobile earth stations receiving in the 1621.35-1626.5 MHz band from imposing constraints on certain other stations operating in adjacent bands; and 4) limiting the unwanted emissions power in the 50.2-50.4 GHz passive band from earth stations in the fixed-satellite service (Earth-to-space) that transmit in the adjacent bands at 49.7-50.2 GHz and 50.4-50.9 GHz.

3. We also address terrestrial issues by proposing amendments to: 1) make the band 495-505 kHz available for use by the international Navigational Data (NAVDAT) system as described in the most recent version of Recommendation ITU-R M.2010 and limit NAVDAT transmitting stations to coast stations; and 2) define and implement a new field strength limit for frequencies at and above 15.7 GHz in the vicinity of the Table Mountain Quiet Zone. The proposed limit, if adopted, would increase at the rate of 20 x log of frequency beginning at 15.7 GHz, to compensate for the receiving antenna effective aperture. The newly defined field strength and power flux density limits above 15.7 GHz would be defined on a per megahertz basis instead of the current criterion of total field strength or power flux density. Moreover, the *WRC-19 Notice* seeks comment on making related updates to our service rules, including those for part 2 and part 25.

[1] 5 U.S.C. § 603. The RFA, 5 U.S.C. §§ 601–612, was amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA), Pub. L. No. 104-121, Title II, 110 Stat. 857 (1996).

[2] 5 U.S.C. § 603(a).

[3] *Id.*

B. Legal Basis

4. The proposed action is authorized pursuant to sections 1, 4(i), 4(j), 7, 301, 303(c), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. §§ 151, 154(i), 154(j), 157, 301, 303(c), 303(f), and 303(r).

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

5. 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 proposed rules, if adopted.[4] The RFA generally defines the term "small entity" as having the same meaning as the terms "small business," "small organization," and "small governmental jurisdiction."[5] In addition, the term "small business" has the same meaning as the term "small business concern" under the Small Business Act.[6] 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.[7]

6. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* Our actions, over time, may affect small entities that are not easily categorized at present. We therefore describe, at the outset, three broad groups of small entities that could be directly affected herein.[8] First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the Small Business Administration's (SBA) Office of Advocacy, in general a small business is an independent business having fewer than 500 employees.[9] These types of small businesses represent 99.9% of all businesses in the United States, which translates to 33.2 million businesses.[10]

7. Next, the type of small entity described as a "small organization" is generally "any not-for-profit enterprise which is independently owned and operated and is not dominant in its field."[11] The Internal Revenue Service (IRS) uses a revenue benchmark of $50,000 or less to delineate its annual electronic filing requirements for small exempt organizations.[12] Nationwide, for tax year 2022, there

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[4] 5 U.S.C. § 603(b)(3).

[5] 5 U.S.C. § 601(6).

[6] 5 U.S.C. § 601(3) (incorporating by reference the definition of "small business concern" in the Small Business Act, 15 U.S.C. § 632). Pursuant to 5 U.S.C. § 601(3), the statutory definition of a small business applies "unless an agency, after consultation with the Office of Advocacy of the Small Business Administration and after opportunity for public comment, establishes one or more definitions of such term that are appropriate to the activities of the agency and publishes such definition(s) in the Federal Register."

[7] 15 U.S.C. § 632.

[8] 5 U.S.C. § 601(3)-(6).

[9] *See* SBA, Office of Advocacy, "What's New With Small Business?," https://advocacy.sba.gov/wp-content/uploads/2023/03/Whats-New-Infographic-March-2023-508c.pdf (Mar. 2023).

[10] *Id*.

[11] 5 U.S.C. § 601(4).

[12] The IRS benchmark is similar to the population of less than 50,000 benchmark in 5 U.S.C § 601(5) that is used to define a small governmental jurisdiction. Therefore, the IRS benchmark has been used to estimate the number of small organizations in this small entity description. S*ee* Annual Electronic Filing Requirement for Small Exempt Organizations – Form 990-N (e-Postcard), "Who must file," https://www.irs.gov/charities-non-profits/annual-electronic-filing-requirement-for-small-exempt-organizations-form-990-n-e-postcard. We note that the IRS data does not provide information on whether a small exempt organization is independently owned and operated or dominant in its field.

were approximately 530,109 small exempt organizations in the U.S. reporting revenues of $50,000 or less according to the registration and tax data for exempt organizations available from the IRS.[13]

8. Finally, the small entity described as a "small governmental jurisdiction" is defined generally as "governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand."[14] U.S. Census Bureau data from the 2022 Census of Governments[15] indicate there were 90,837 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States.[16] Of this number, there were 36,845 general purpose governments (county,[17] municipal, and town or township[18]) with populations of less than 50,000 and 11,879 special purpose governments (independent school districts[19]) with enrollment populations of less than 50,000.[20] Accordingly, based on the 2022 U.S. Census of Governments data, we estimate that at least 48,724 entities fall into the category of "small governmental jurisdictions."[21]

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[13] *See* Exempt Organizations Business Master File Extract (EO BMF), "CSV Files by Region," https://www.irs.gov/charities-non-profits/exempt-organizations-business-master-file-extract-eo-bmf. The IRS Exempt Organization Business Master File (EO BMF) Extract provides information on all registered tax-exempt/non-profit organizations. The data utilized for purposes of this description was extracted from the IRS EO BMF data for businesses for the tax year 2022 with revenue less than or equal to $50,000 for Region 1-Northeast Area (71,897), Region 2-Mid-Atlantic and Great Lakes Areas (197,296), and Region 3-Gulf Coast and Pacific Coast Areas (260,447) that includes the continental U.S., Alaska, and Hawaii. This data includes information for Puerto Rico (469).

[14] 5 U.S.C. § 601(5).

[15] 13 U.S.C. § 161. The Census of Governments survey is conducted every five (5) years compiling data for years ending with "2" and "7". *See also* Census of Governments, https://www.census.gov/programs-surveys/economic-census/year/2022/about.html.

[16] *See* U.S. Census Bureau, 2022 Census of Governments – Organization Table 2. Local Governments by Type and State: 2022 [CG2200ORG02], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. Local governmental jurisdictions are made up of general purpose governments (county, municipal and town or township) and special purpose governments (special districts and independent school districts). *See also* tbl.2. CG2200ORG02 Table Notes_Local Governments by Type and State_2022.

[17] *See id.* at tbl.5. County Governments by Population-Size Group and State: 2022 [CG2200ORG05], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. There were 2,097 county governments with populations less than 50,000. This category does not include subcounty (municipal and township) governments.

[18] *See id.* at tbl.6. Subcounty General-Purpose Governments by Population-Size Group and State: 2022 [CG2200ORG06], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. There were 18,693 municipal and 16,055 town and township governments with populations less than 50,000.

[19] *See id.* at tbl.10. Elementary and Secondary School Systems by Enrollment-Size Group and State: 2022 [CG2200ORG10], https://www.census.gov/data/tables/2022/econ/gus/2022-governments.html. There were 11,879 independent school districts with enrollment populations less than 50,000. *See also* tbl.4. Special-Purpose Local Governments by State Census Years 1942 to 2022 [CG2200ORG04], CG2200ORG04 Table Notes_Special Purpose Local Governments by State_Census Years 1942 to 2022.

[20] While the special purpose governments category also includes local special district governments, the 2022 Census of Governments data does not provide data aggregated based on population size for the special purpose governments category. Therefore, only data from independent school districts is included in the special purpose governments category.

[21] This total is derived from the sum of the number of general purpose governments (county, municipal and town or township) with populations of less than 50,000 (36,845) and the number of special purpose governments - independent school districts with enrollment populations of less than 50,000 (11,879), from the 2022 Census of Governments - Organizations tbls. 5, 6 & 10.

9. *Amateur Radio Service.* Amateur service is a radiocommunication service intended for self-training, intercommunication and technical investigations carried out by amateurs, that is, duly authorized persons interested in radio technique solely with a personal aim and without pecuniary interest.[22] Amateur radio service encompasses amateur service, amateur-satellite service and radio amateur civil emergency service.[23] Licenses are generally held by individuals but can also be held by clubs, associations and other non-profit entities. Radio Stations[24] is the closest industry with an SBA small business size standard applicable to this service. The SBA small business size standard for this industry classifies a small entity as one that has $47 million or less in annual receipts.[25] U.S. Census Bureau data for 2017 show that 2,963 firms operated in this industry during that year.[26] Of this number, 1,879 firms operated with revenue of less than $25 million per year.[27] Therefore, based on the SBA's size standard the majority of firms are small entities. Additionally, according to Commission data as of December 2021, there were approximately 841,734 active licenses for this service.[28] While the majority of these licenses are held by individuals, the Commission estimates that the licenses in this service held by clubs, associations and other non-profit entities are small entities under the SBA small business size standard.

10. *Aviation and Marine Radio Services. Maritime mobile service is a* mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations. Survival craft stations and emergency position indicating radio beacon (EPIRB) stations also participate in this service.[29] Small businesses in the aviation and marine radio services use a marine very high frequency (VHF), medium frequency (MF), or high frequency (HF) radio, any type of EPIRB and/or radar, an aircraft radio, and/or any type of emergency locator transmitter (ELT) and may provide fixed, mobile, or hybrid voice or data communications. *Aviation services are* radio-communication services for the operation of aircraft. These services includ*e* aeronautical fixed service, aeronautical mobile service, aeronautical radiodetermination service, and secondarily, the handling of

[22] *See* 47 CFR § 97.3(a)(4).

[23] *See id.* § 97.3(a)(2).

[24] *See* U.S. Census Bureau, *2017 NAICS Definition, "515112 Radio Stations,"* https://www.census.gov/naics/?input=515112&year=2017&details=515112.

[25] *See* 13 CFR § 121.201, NAICS Code 515112 (as of 10/1/22 NAICS Code 516110).

[26] *See* U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 515112, https://data.census.gov/cedsci/table?y=2017&n=515112&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available. We note that the US Census Bureau withheld publication of the number of firms that operated for the entire year.

[27] *Id.* The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We note that the U.S. Census Bureau withheld publication of the number of firms that operated with sales/value of shipments/revenue in the individual categories for less than $100,000, and $100,000 to $249,999 to avoid disclosing data for individual companies (see Cell Notes for the sales/value of shipments/revenue in these categories). Therefore, the number of firms with annual receipts that meet the SBA size standard would be higher that noted herein. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[28] Based on a FCC Universal Licensing System search on December 9, 2021, https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = HV, HA; Authorization Type = All; Status = Active.

[29] *See 47 CFR § 80.5.*

public correspondence on frequencies in the maritime mobile and maritime mobile satellite services to and from aircraft.[30]

11. Wireless Telecommunications Carriers (except Satellite)[31] is the closest industry with a SBA small business size standard applicable to these services. The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees.[32] U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year.[33] Of this number, 2,837 firms employed fewer than 250 employees.[34] Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small. Additionally, according to Commission data as December 2021, there were 14,532 active licenses in the Aviation and Marine Radio Services.[35] However, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

12. *Marine Radio Services. Maritime mobile service is a* mobile service between coast stations and ship stations, or between ship stations, or between associated on-board communication stations. Survival craft stations and emergency position indicating radio beacon (EPIRB) stations also participate in this service.[36] Small businesses in the aviation and marine radio services use a marine very high frequency (VHF), medium frequency (MF), or high frequency (HF) radio, any type of EPIRB and/or radar, an aircraft radio, and/or any type of emergency locator transmitter (ELT) and may provide fixed, mobile, or hybrid voice or data communications. Wireless Telecommunications Carriers (*except* Satellite)[37] is the closest industry with a SBA small business size standard applicable to these services. The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees.[38] U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year.[39] Of this number, 2,837 firms employed fewer than 250 employees.[40]

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[30] *See id.* § 87.5.

[31] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers* (*except Satellite*)," https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[32] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[33] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[34] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[35] Based on a FCC Universal Licensing System search on December 21, 2021, https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = AA, AF, AR, MA, MC, Mk, MR; Authorization Type = All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

[36] *See 47 CFR § 80.5.*

[37] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers* (*except Satellite*)," https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[38] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[39] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

Thus, under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

13. The Commission's small business size standards with respect to Marine Radio Services involve eligibility for bidding credits and installment payments in the auction of VHF Public Coast licenses in the 157.1875-157.4500 MHz (ship transmit) and 161.775-162.0125 MHz (coast transmit) bands.[41] According to Commission data as of December 2021, there were approximately 262 active Public Coast licenses[42] and 3,753 active Maritime Coast licenses.[43] For Public Coast license auction purposes,, the Commission defined a "small" business as an entity that, together with controlling interests and affiliates, has average gross revenues for the preceding three years not to exceed $15 million dollars, and a "very small" business as an entity that, together with controlling interests and affiliates, has average gross revenues for the preceding three years not to exceed $3 million dollars.[44] Pursuant to these definitions, 3 small business bidders won 17 licenses,[45] and 3 winning bidders claiming a small business qualification won 9 licenses.[46] As of December 2021, two of the winning bidders in these auctions claiming small business credits had active licenses.[47]

14. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

15. *Mobile Satellite Earth Stations.* Neither the SBA nor the Commission have developed a small business size standard specifically applicable to Mobile Satellite Earth Stations. Satellite

(Continued from previous page)

[40] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[41] Public coast stations provide ship/shore radiotelephone and radiotelegraph services. *See 47 CFR § 80.453.*

[42] Based on a FCC Universal Licensing System search on December 21 2021, https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = MA, MC, MK, MR; Authorization Type = All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

[43] Based on a FCC Universal Licensing System search on December 21, 2021, https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = PC; Authorization Type = All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

[44] *See 47 CFR* § 80.1252(b)(1)-(2).

[45] S*ee* Federal Communications Commission, Economics and Analytics, Auctions, Auction 20: VHF Public Coast, Summary, Winning Bidders, https://www.fcc.gov/auction/20; *see also* https://www.fcc.gov/sites/default/files/wireless/auctions/20/charts/20press5.pdf.

[46] S*ee* Federal Communications Commission, Economics and Analytics, Auctions, Auction 39: VHF Public Coast and Location Monitoring Services, Summary, Closing Charts, License Winners, Sorted by License, https://www.fcc.gov/sites/default/files/wireless/auctions/39/charts/39cls3.pdf.

[47] Based on a FCC Universal Licensing System search on December 21, 2021, https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = PC; Authorization Type = All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

Telecommunications[48] is the closest industry with a SBA small business size standard. The SBA small business size standard classifies a business with $44 million or less in annual receipts as small.[49] For this industry, U.S. Census Bureau data for 2017 show that there were 275 firms that operated for the entire year.[50] Of this number, 242 firms had revenue of less than $25 million.[51] Thus, for this industry under the SBA size standard, the Commission estimates that the majority of Mobile Satellite Earth Station licensees are small entities. The Commission notes however, that the SBA's revenue small business size standard is applicable to a broad scope of satellite telecommunications providers included in the U.S. Census Bureau's Satellite Telecommunications industry definition. Additionally, based on Commission data as of February 1, 2024, there were 16 Mobile Satellite Earth Stations licensees.[52] The Commission does not request nor collect annual revenue information from satellite telecommunications providers, and is therefore unable to estimate the number of Mobile Satellite Earth Station licensees that would be classified as a small business under the SBA size standard.

16. *Fixed Satellite Small Transmit/Receive Earth Stations.* Neither the SBA nor the Commission have developed a small business size standard specifically applicable to Fixed Satellite Small Transmit/Receive Earth Stations. Satellite Telecommunications[53] is the closest industry with an SBA small business size standard. The SBA size standard for this industry classifies a business as small if it has $44 million or less in annual receipts.[54] For this industry, U.S. Census Bureau data for 2017 show that there was a total of 275 firms that operated for the entire year.[55] Of this total, 242 firms had revenue of less than $25 million.[56] Consequently, using the SBA's small business size standard most fixed satellite small transmit/receive earth stations can be considered small entities. The Commission notes however, that the SBA's revenue small business size standard is applicable to a broad scope of satellite telecommunications providers included in the U.S. Census Bureau's Satellite Telecommunications industry definition. Additionally, the Commission does not request nor collect annual revenue information from satellite telecommunications providers and is therefore unable to more accurately

[48] *See* U.S. Census Bureau, *2017 NAICS Definition, "517410 Satellite Telecommunications,"* https://www.census.gov/naics/?input=517410&year=2017&details=517410.

[49] *See* 13 CFR § 121.201, NAICS Code 517410.

[50] See U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 517410, https://data.census.gov/cedsci/table?y=2017&n=517410&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[51] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[52] Based on a FCC Space Bureau, International Communication Filing System (ICFS), Advanced Search on February 1, 2024, https://licensing.fcc.gov/cgi-bin/ws.exe/prod/ib/forms/reports/swr030b.hts?set=. Search Terms used - Nature of Application Service = SES - Satellite Earth Station; Application Type = All; Class of Station = MES – Mobile Earth Station; and under "Filing Status" = Current.

[53] *See* U.S. Census Bureau, *2017 NAICS Definition, "517410 Satellite Telecommunications,"* https://www.census.gov/naics/?input=517410&year=2017&details=517410.

[54] *See* 13 CFR § 121.201, NAICS Code 517410.

[55] See U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 517410, https://data.census.gov/cedsci/table?y=2017&n=517410&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[56] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

estimate the number of fixed satellite small transmit/receive earth stations that would be classified as a small business under the SBA size standard.

17. *Satellite Telecommunications.* This 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."[57] Satellite telecommunications service providers include satellite and earth station operators. The SBA small business size standard for this industry classifies a business with $44 million or less in annual receipts as small.[58] U.S. Census Bureau data for 2017 show that 275 firms in this industry operated for the entire year.[59] Of this number, 242 firms had revenue of less than $25 million.[60] Consequently, using the SBA's small business size standard most satellite telecommunications service providers can be considered small entities. The Commission notes however, that the SBA's revenue small business size standard is applicable to a broad scope of satellite telecommunications providers included in the U.S. Census Bureau's Satellite Telecommunications industry definition. Additionally, the Commission neither requests nor collects annual revenue information from satellite telecommunications providers and is therefore unable to more accurately estimate the number of satellite telecommunications providers that would be classified as a small business under the SBA size standard.

18. *Frequency Coordinators*. Frequency coordinators are entities or organizations certified by the Commission to recommend frequencies for use by licensees in the Private Land Mobile Radio Services (PLMR) that will most effectively meet the applicant's needs while minimizing interference to licensees already operating within a given frequency band. Neither the Commission nor the SBA have developed a small business size standard specifically applicable to spectrum frequency coordinators. Business Associations[61] which comprise establishments primarily engaged in promoting the business interests of their member, is the closest applicable industry with a SBA small business size standard.[62]

19. The SBA small business size standard for Business Associations classifies firms with annual receipts of $15.5 million or less as small.[63] For this industry, U.S. Census Bureau data for 2017 show that there were 14,540 firms that operated for the entire year.[64] Of these firms, 11,215 had revenue of less than $5 million.[65] Based on this data, the majority of firms in the Business Associations industry

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[57] *See* U.S. Census Bureau, *2017 NAICS Definition, "517410 Satellite Telecommunications,"* https://www.census.gov/naics/?input=517410&year=2017&details=517410.

[58] *See* 13 CFR § 121.201, NAICS Code 517410.

[59] See U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 517410, https://data.census.gov/cedsci/table?y=2017&n=517410&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[60] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[61] *See* U.S. Census Bureau, *2017 NAICS Definition*, "*813910 Business Associations,*" https://www.census.gov/naics/?input=813910&year=2017&details=813910.

[62] *See* 13 CFR § 121.201, NAICS Code 813910.

[63] *Id*.

[64] *See* U.S. Census Bureau, 2017 Economic Census of the United States, Selected Sectors: Sales, Value of Shipments, or Revenue Size of Firms for the U.S.: 2017, Table ID: EC1700SIZEREVFIRM, NAICS Code 813910, https://data.census.gov/cedsci/table?y=2017&n=813910&tid=ECNSIZE2017.EC1700SIZEREVFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

can be considered small. However, the Business Associations industry is very broad and does not include specific figures for firms that are engaged in frequency coordination. Thus, the Commission is unable to ascertain exactly how many of the frequency coordinators are classified as small entities under the SBA size standard. According to Commission data, there are 13 entities certified to perform frequency coordination functions under Part 90 of the Commission's rules.[66] For purposes of this IRFA the Commission estimates that a majority of the 13 FCC-certified frequency coordinators are small.

20. *Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing.* This industry comprises establishments primarily engaged in manufacturing search, detection, navigation, guidance, aeronautical, and nautical systems and instruments.[67] Examples of products made by these establishments are aircraft instruments (except engine), flight recorders, navigational instruments and systems, radar systems and equipment, and sonar systems and equipment.[68] The SBA small business size standard for this industry classifies a business with 1,250 or fewer employees as small.[69] 2017 U.S. Census Bureau data show that 421 firms operated in this industry for the entire year.[70] Of that number, 332 firms operated with less than 250 employees.[71] Based on this data, we conclude that a majority of manufacturers in this industry are small.

21. *Air-Ground Radiotelephone Service*. Air-Ground Radiotelephone Service is a wireless service in which licensees are authorized to offer and provide radio telecommunications service for hire to subscribers in aircraft.[72] A licensee may provide any type of air-ground service (i.e., voice telephony, broadband Internet, data, etc.) to aircraft of any type, and serve any or all aviation markets (commercial,

(Continued from previous page)

[65] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We note that the U.S. Census Bureau withheld publication of the number of firms that operated with sales/value of shipments/revenue in the individual category for less than $100,000, to avoid disclosing data for individual companies (see Cell Notes for the sales/value of shipments/revenue in this category). Therefore, the number of firms with revenue that meet the SBA size standard would be higher than noted herein. We also note that according to the U.S. Census Bureau glossary, the terms receipts and revenues are used interchangeably, *see* https://www.census.gov/glossary/#term_ReceiptsRevenueServices.

[66] The Commission's records indicate that there are currently 13 frequency coordinators that would be affected by this rulemaking. *See* https://www.fcc.gov/wireless/bureau-divisions/mobility-division/industrial-business/industrial-business-licensing#frequency-coordinators.

[67] *See* U.S. Census Bureau, 2017 NAICS Definition, "334511 Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing," https://www.census.gov/naics/?input=334511&year=2017&details=334511.

[68] *Id*.

[69] *See* 13 CFR § 121.201, NAICS Code 334511.

[70] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Selected Sectors: Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 334511, https://data.census.gov/cedsci/table?y=2017&n=334511&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[71] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard. We note that the US Census Bureau withheld publication of the number of firms that operated for the entire year and the number of firms that operated with 5 to 9 employees, to avoid disclosing data for individual companies (see Cell Notes for "Firms operated for the entire year" and "Firms operated for the entire year with 5 to 9 employees"). Therefore, the number of firms that meet the SBA size standard would be higher than noted herein.

[72] 47 CFR § 22.99.

government, and general). A licensee must provide service to aircraft and may not provide ancillary land mobile or fixed services in the 800 MHz air-ground spectrum.[73]

22. The closest industry with an SBA small business size standard applicable to these services is Wireless Telecommunications Carriers (*except* Satellite).[74] The SBA small business size standard for this industry classifies a business as small if it has 1,500 or fewer employees.[75] U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year.[76] Of this number, 2,837 firms employed fewer than 250 employees.[77] Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

23. Based on Commission data as of December 2021, there were approximately four licensees with 110 active licenses in the Air-Ground Radiotelephone Service.[78] The Commission's small business size standards with respect to Air-Ground Radiotelephone Service involve eligibility for bidding credits and installment payments in the auction of licenses. For purposes of auctions, the Commission defined "small business" as an entity that, together with its affiliates and controlling interests, has average gross revenues not exceeding $40 million for the preceding three years, and a "very small business" as an entity that, together with its affiliates and controlling interests, has had average annual gross revenues not exceeding $15 million for the preceding three years.[79] In the auction of Air-Ground Radiotelephone Service licenses in the 800 MHz band, neither of the two winning bidders claimed small business status.[80]

24. In frequency bands where licenses were subject to auction, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, the Commission does not collect data on the number of employees for licensees providing these services therefore, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

25. *Future 24 GHz Licensees*. 24 GHz spectrum services in the 24.25 – 24.45 GHz and 24.75 – 25.25 GHz bands involve a fixed point-to-point, point-to-multipoint, and multipoint-to-multipoint

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[73] *See* Federal Communications Commission, Economics and Analytics, Auctions, Auction 65: 800 MHz Air-Ground Radiotelephone Service, Fact Sheet, Permissible Operations, https://www.fcc.gov/auction/65/factsheet.

[74] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers* (*except Satellite*)," https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[75] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[76] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[77] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[78] Based on a FCC Universal Licensing System search on December 20, 2021, https://wireless2.fcc.gov/UlsApp/UlsSearch/searchAdvanced.jsp. Search parameters: Service Group = All, "Match only the following radio service(s)", Radio Service = CG, CJ; Authorization Type = All; Status = Active. We note that the number of active licenses does not equate to the number of licensees. A licensee can have one or more licenses.

[79] *See* 47 CFR § 22.223(b).

[80] *See* Federal Communications Commission, Economics and Analytics, Auctions, Auction 65: 800 MHz Air-Ground Radiotelephone Service, Summary, Closing Charts, Licenses by Bidder, https://www.fcc.gov/sites/default/files/wireless/auctions/65/charts/65cls2.pdf.

radio system in the 24.25-24.45 GHz band and in the 25.05-25.25 GHz band consisting of a fixed main (nodal) station and a number of fixed user terminals.[81] These services are flexible-use wireless service that may encompass any digital fixed service. Wireless Telecommunications Carriers (except Satellite)[82] is the closest industry with a SBA small business size standard applicable to these services. The SBA size standard for this industry classifies a business as small if it has 1,500 or fewer employees.[83] U.S. Census Bureau data for 2017 show that there were 2,893 firms that operated in this industry for the entire year.[84] Of this total, 2,837 firms employed fewer than 250 employees.[85] Thus under the SBA size standard, the Commission estimates that a majority of licensees in this industry can be considered small.

26. The Commission's small business size standards with respect to 24 GHz licensees involve eligibility for bidding credits and installment payments in the auction of licenses for 24 GHz services. In 2019 in Auction 102, 2,909 licenses in the 24 GHz band were auctioned as part of the Commission's auction of Upper Microwave Flexible Use Service licenses.[86] For purposes of bidding credits, the Commission defined "small business" as an entity with average annual gross revenues that did not exceed $55 million for the preceding three years average, and a "very small business" as an entity with average annual gross revenues that did not exceed $20 million for the preceding three years.[87] Of the 2,909 licenses auctioned in the 24 GHz band in Auction 102, **7** bidders claimed small business status winning 34 licenses.[88]

27. For those services subject to auctions, the Commission notes that as a general matter, the number of winning bidders that qualify as small businesses at the close of an auction does not necessarily represent the number of small businesses currently in service. Further, the Commission does not generally track subsequent business size unless, in the context of assignments or transfers, unjust enrichment issues are implicated. Additionally, since the Commission does not collect data on the number of employees for licensees providing these services, at this time we are not able to estimate the number of licensees with active licenses that would qualify as small under the SBA's small business size standard.

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

28. The *WRC-19 Notice* proposes and seeks comment regarding the implementation of WRC-19 allocation decisions and other rule changes. Further, the *WRC-19 Notice* proposes to revise three footnotes to the U.S. Table of Frequency Allocations (U.S. Table) and revise the Commission's

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[81] *See* 47 CFR § 101.3.

[82] *See* U.S. Census Bureau, *2017 NAICS Definition, "517312 Wireless Telecommunications Carriers* (*except Satellite*)," https://www.census.gov/naics/?input=517312&year=2017&details=517312.

[83] *See* 13 CFR § 121.201, NAICS Code 517312 (as of 10/1/22, NAICS Code 517112).

[84] *See* U.S. Census Bureau, *2017 Economic Census of the United States*, *Employment Size of Firms for the U.S.: 2017,* Table ID: EC1700SIZEEMPFIRM, NAICS Code 517312, https://data.census.gov/cedsci/table?y=2017&n=517312&tid=ECNSIZE2017.EC1700SIZEEMPFIRM&hidePreview=false. At this time, the 2022 Economic Census data is not available.

[85] *Id*. The available U.S. Census Bureau data does not provide a more precise estimate of the number of firms that meet the SBA size standard.

[86] *See* Federal Communications Commission, Office of Economics and Analytic, Auctions, Auction 102: Spectrum Frontiers – 24 GHz, Fact Sheet, https://www.fcc.gov/auction/102/factsheet.

[87] *See* 47 CFR § 30.302(a).

[88] *See Auction of 24 GHz Upper Microwave Flexible Use Service Licenses Closes; Winning Bidders Announced for Auction 102*, Public Notice, DA-19-485, Attachment A, 34 FCC Rcd 4294 (WTB/OEA 2019); *see also* https://www.fcc.gov/document/auction-102-closing-public-notice/attachment-a.

related rules concerning satellite and terrestrial operations, which may impose new compliance, reporting, or recordkeeping requirements for small entities.

29. The *WRC-19 Notice* addresses satellite and terrestrial issues with proposals to implement certain WRC-19 allocation decisions in part 2 of the Commission's rules, seeks comment on the need to revise parts 25 and 80 of the rules to reflect the allocation changes and other WRC-19 decisions, and seeks comment on making other rule changes that are not related to WRC-19 implementation. The Commission proposes to address satellite issues regarding operations of space stations in non-geostationary orbits with short-duration missions in the 137-138 MHz (space-to-Earth) and 148-149.9 MHz (Earth-to-space) bands by adding the following three international footnotes to the Federal and non-Federal portions of the U.S. Table:

- 5.203C In the 137-137.025 MHz, 137.025-137.175 MHz, 137.175-137.825 MHz, and 137.825-138 MHz sub-bands, use of the space operation service (space-to-Earth) with NGSO satellite short duration-mission systems in the 137-138 MHz band is subject to Resolution 660, which limits such use to the 137.025-138 MHz band and limits the power flex-density at any point on the Earth's surface to specific levels;
- 5.209A In the 137.175-137.825 MHz sub-band, use of the 137.175-137.825 MHz band by NGSO satellite systems in the space operation service identified as a short-duration mission is not subject to ITU regulation No. 9.11A;
- 5.218A In the 148-149.9 MHz sub-band, space operation service NGSO systems may not cause harmful interference to, or claim protection from, existing primary services within the 148-149.9 MHz band, or impose additional constraints on the space operation and mobile-satellite services, and that earth stations power flux-density must not exceed specific levels for more than 1% of the time at the border of the territory of 16 specific countries.

30. In addition, we make proposals to add a new allocation for the maritime mobile-satellite service (space-to-earth) on a primary basis for Federal and non-Federal shared use subject to the conditions in four new footnotes. We propose to add the following footnotes to the U.S. Table of Frequency Allocations:

- 5.208B In the frequency bands 137-138 MHz, 157.1875-157.3375 MHz, 161.7875-161.9375 MHz, 387-390 MHz, 400.15-401 MHz, 1452-1492 MHz, 1525-1610 MHz, 1613.8-1626.5 MHz, 2655-2690 MHz, and 21.4-22 GHz, Resolution 739 (Rev.WRC-19) applies. Resolution 739 recommends unwanted emissions limits to ensure that unwanted emissions from geostationary and non-geostationary space stations that are planned to operate in the mobile-satellite service (space-to-Earth) in the 1613.8-1626.5 MHz band are minimized in order to protect radio astronomy service stations in the 1610.6-1613.8 MHz band from harmful interference;
- 5.370 In Venezuela, the allocation to the radiodetermination-satellite service in the 1610-1626.5 MHz frequency band (Earth-to-space) is on a secondary basis;
- 5.373 Maritime mobile earth stations receiving in the 1621.35-1626.5 MHz band shall not impose additional constraints on earth stations operating in the maritime mobile-satellite service or maritime earth stations of the radiodetermination-satellite service operating in accordance with the ITU Radio Regulations in the 1610-1621.35 MHz frequency band, or on earth stations in the maritime mobile-satellite service operating in accordance with the ITU Radio Regulations in the 1626.5-1660.5 MHz frequency band, unless otherwise agreed between the notifying administrations; and
- 5.373A Maritime mobile earth stations receiving in the 1621.35-1626.5 MHz frequency band shall not impose constraint on the assignment of earth station in the mobile-satellite service (Earth-to-space) and the radiodetermination-satellite service (Earth-to-space) in

> the 1621.35-1626.5 MHz frequency band in networks for which complete coordination information has been received by [ITU] Radiocommunication Bureau before October 28, 1990.

31. These proposals are meant to provide additional satellite coverage to the Global Maritime Distress and Safety System (GMDSS) for use in the U.S, and would, if adopted, align the 1621.35-1626.5 MHz band in the U.S. Table of Frequency Allocations with the decisions made in the *WRC-19 Final Acts*. However, we seek further comments from small entities on the addition of a primary maritime mobile-satellite service allocation to the 1621.35-1626.5 MHz band.

32. Also, the *WRC-19 Notice* addresses the operation of earth stations in motion (ESIMs) communicating with geostationary orbit fixed-satellite service (GSO FSS) space stations by the addition of footnote 5.517A to the 17.7-19.7 GHz (space-to-Earth) and 27.5-29.5 GHz (Earth-to-space) frequency bands of the U.S. Table. The *WRC-19 Notice* concludes that the addition of footnote 5.517A, which states, *inter alia*, the frequencies that are available for use by ESIMs communicating with GSO FSS space stations to the 17.7-19.7 GHz and 27.5-29.5 GHz bands, is not compatible with current section 25.202(10)(ii) of the Commission's rules regarding ESIM operations. These conditions require comments on this tentative conclusion to better assess any impacts it may have on small entities. Lastly, for NGSO earth stations brought into use prior to January 1, 2021 or GSO earth stations brought into use prior to January 1, 2024, that transmit in the 49.7-50.2 GHz and 50.4-50.9 GHz bands we propose that unwanted emissions shall not exceed -20 dBW/200 MHz, except that the maximum unwanted emissions power may be increased to -10 dBW/200 MHz for earth stations having an antenna gain greater than or equal to 57dBi. We request comment on these proposed updates.

33. Lastly, the *WRC-19 Notice* propose revisions on terrestrial issues. Specifically, the *WRC-19 Notice* proposes to make the 495-505 kHz band available for digital broadcasting of maritime safety and security related information from shore-to-ship, i.e., the international Navigational Data (NAVDAT) system, by adding a reference to footnote 5.82C in the 495-505 kHz band in the non-Federal portion of the U.S. Table and revising footnote US79A to reflect WRC-19's changes to footnote 5.79 (expanding the permitted uses of the maritime mobile service in the 415-495 kHz and 505-526.5 kHz (505-510 kHz in Region 2, which includes the U.S and its territories) bands from radiotelegraphy to include NAVDAT systems. These proposals require further consideration, comment, and await improved data and technical justification at a later date.

34. The proposed rule changes in *WRC-19 Notice* may impose new compliance, reporting, or recordkeeping requirements for small entities, which may lead to incurring additional operational or implementation costs. At this time, however, the Commission is not in a position to determine whether, if adopted, our proposals and the matters upon which we seek comment will require small entities to hire professionals to comply and cannot quantify the cost of compliance with the potential rule changes discussed herein. We anticipate the information we receive in comments including, where requested, cost and benefit analyses, will help the Commission identify and evaluate relevant compliance matters for small entities, including compliance costs and other burdens that may result from the proposals and inquiries we make in the *WRC-19 Notice*.

E. Steps Taken to Minimize Significant Economic Impact on Small Entities, and Significant Alternatives Considered

35. The RFA requires an agency to describe any significant, specifically small business, alternatives that it has considered in reaching its proposed approach, which may include the following four alternatives (among others): "(1) the establishment of differing compliance or reporting requirements or timetables that take into account the resources available to small entities; (2) the clarification, consolidation, or simplification of compliance and reporting requirements under the rule for such small

entities; (3) the use of performance rather than design standards; and (4) an exemption from coverage of the rule, or any part thereof, for such small entities."[89]

36. In the *WRC-19 Notice*, the Commission proposes alternatives to address satellite issues regarding operations of space stations in non-geostationary orbits with short-duration missions in the 137-138 MHz (space-to-Earth) and 148-149.9 MHz (Earth-to-space) bands. These proposals, if adopted, would make the space operation service in the 137-138 MHz space-to-earth (downlink) band and the 148-149.9 MHz Earth-to-space (uplink) band available to space stations in non-geostationary orbits (NGSOs) with short-duration missions of 3 years or less. We propose this alternative because as short-duration NGSO space missions are rapidly growing, there is now a demand for more suitable spectrum for NGSO satellites. Further, these types of missions will provide affordable options for scientific and commercial space purposes by new entrants in the space sector, thereby allowing small entities to take advantage of decreasing costs associated with launch.

37. The *WRC-19 Final Acts* adopted footnote 5.82C, which states that the 495-505 kHz band is allocated to the maritime mobile service on a primary basis in all ITU Regions. Under the Commission's rules, in the U.S. Table of Frequency Allocations, the 495-505 kHz band is allocated to the maritime mobile service on a primary basis for Federal/non-Federal shared use. However, the proposed alternative to reference the available 495-505 kHz band to footnote 5.82C, would allow the NAVDAT system to provide greatly improved data throughput from that provided by the Navigational Telex (NAVTEX) system and would provide protection to the NAVTEX system and any small entities that could be effected. However, such implementation of the NAVDAT system will require service-specific rules to be added to Part 80 of the Commission's rules which will be addressed at a later date.

38. Under the Commission's rules, the 435-472 kHz, 479-495 kHz, and 505-510 kHz bands are allocated to the maritime mobile service on a primary basis for Federal/non-Federal shared use and footnote US79A applies. The Commission believes US79A should be replaced by the text of footnote 5.79 with the exception that the frequency bands that are not currently authorized in the U.S. Table (the 472-479 kHz and 510-526.5 kHz bands are not allocated for the maritime mobile service), should not be listed in footnote US79A. These proposed alternatives in the *WRC-19 Notice* would make the 435-472 kHz and 479-510 kHz bands available to the international NAVDAT system but will require comment.

39. To assist in the Commission's evaluation of the economic impact on small entities as a result of proposed footnotes and rules in the *WRC-19 Notice*, and to better explore options and alternatives, the Commission seeks public comment as to whether the proposals pose any significant economic impacts to small entities and whether any of the costs associated with the *WRC-19 Notice* requirements can be alleviated for small entities. The Commission expects to more fully consider the economic impact and alternatives for small entities following the review of comments filed in response to the *WRC-19 Notice*.

A. Federal Rules that May Duplicate, Overlap, or Conflict with the Proposed Rules

40. None.

[89] 5 U.S.C. § 603(c)(1)–(4).