

Dated: July 29, 2024.

**Edward Messina,**

*Director, Office of Pesticide Programs.*

Therefore, for the reasons stated in the preamble, EPA is amending 40 CFR chapter I as follows:

## **PART 180—TOLERANCES AND EXEMPTIONS FOR PESTICIDE CHEMICAL RESIDUES IN FOOD**

■ 1. The authority citation for part 180 continues to read as follows:

**Authority:** 21 U.S.C. 321(q), 346a and 371.

■ 2. Add § 180.1413 to subpart D to read as follows:

### **§ 180.1413 Potassium Carbonate; exemption from the requirement of a tolerance.**

An exemption from the requirement of a tolerance is established for residues of potassium carbonate in or on all food commodities when used as a biochemical fungicide in or on all agricultural food commodities in accordance with label directions and good agricultural practices.

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## **FEDERAL COMMUNICATIONS COMMISSION**

### **47 CFR Parts 0, 1, 2, and 26**

[ET Docket No. 13–115; RM–11341; FCC 23–76; FR ID 234720]

### **Allocation of Spectrum for Non-Federal Space Launch Operations; Federal Earth Stations Communicating With Non-Federal Fixed Satellite Service Space Stations; and Federal Space Station Use of the 399.9–400.05 MHz Band**

**AGENCY:** Federal Communications Commission.

**ACTION:** Final rule.

**SUMMARY:** In this document, the Federal Communications Commission (Commission) adopts a new secondary allocation in the 2025–2110 MHz band for non-Federal space operations, removes the restriction on use of the 2200–2290 MHz secondary non-Federal space operation allocation to four specific sub-channels to make the entire 2200–2290 MHz band available, adds a non-Federal secondary mobile allocation to the 2200–2290 MHz band, and adopts licensing and technical rules for space launch operations. Additionally, the Commission amends the allocation for the 399.9–400.05 MHz band to permit the deployment of Federal space stations.

### **DATES:**

**Effective date:** Effective September 4, 2024, except for amendatory instructions 10 through 13 (adding §§ 26.106, 26.108, 26.202, and 26.301, respectively), which are delayed indefinitely. The Commission will publish a document in the **Federal Register** announcing the effective date.

**Incorporation by reference:** The incorporation by reference of certain material listed herein is approved by the Director of the Federal Register as of September 4, 2024.

### **FOR FURTHER INFORMATION CONTACT:**

Nicholas Oros of the Office of Engineering and Technology, at [Nicholas.Oros@fcc.gov](mailto:Nicholas.Oros@fcc.gov) or 202–418–0636; Linda Chang of the Wireless Telecommunications Bureau at [Linda.Chang@fcc.gov](mailto:Linda.Chang@fcc.gov) or 202–418–1339; or Julia Malette of the Space Bureau, at [Julia.Malette@fcc.gov](mailto:Julia.Malette@fcc.gov) or 202–418–2453. For information regarding the Paperwork Reduction Act (PRA) information requirements contained in this document, contact Nicole Ongele, Office of Managing Director, at (202) 418–2991 or [Nicole.Ongele@fcc.gov](mailto:Nicole.Ongele@fcc.gov).

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission’s *Second Report and Order*, in ET Docket No. 13–115; RM–11341; FCC 23–76, adopted on September 21, 2023, and released on September 22, 2023. The full text of this document is available for public inspection and can be downloaded at: <https://docs.fcc.gov/public/attachments/FCC-23-76A1.pdf>. Alternative formats are available for people with disabilities (Braille, large print, electronic files, audio format) by sending an email to [FCC504@fcc.gov](mailto:FCC504@fcc.gov) or calling the Commission’s Consumer and Governmental Affairs Bureau at (202) 418–0530 (voice), (202) 418–0432 (TTY).

### **Procedural Matters**

**Final Regulatory Flexibility Analysis.** The Regulatory Flexibility Act of 1980 (RFA) requires that an agency prepare a regulatory flexibility analysis for notice and comment rulemakings, unless the agency certifies that “the rule will not, if promulgated, have a significant economic impact on a substantial number of small entities.” Accordingly, the Commission has prepared a Final Regulatory Flexibility Analysis (FRFA) concerning the possible impact of the rule changes contained in the *Second Report and Order* on small entities. The FRFA is set forth in Appendix B of the FCC document, <https://docs.fcc.gov/public/attachments/FCC-23-76A1.pdf>.

**Paperwork Reduction Act.** The *Second Report and Order* contains new

information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA), Public Law 104–13. It will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies will be invited to comment on the new or modified information collection requirements contained in this proceeding. In addition, the Commission notes that pursuant to the Small Business Paperwork Relief Act of 2002, Public Law 107–198, *see* 44 U.S.C. 3506(c)(4), the Commission previously sought specific comment on how it might further reduce the information collection burden for small business concerns with fewer than 25 employees.

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

**Accessing Materials.** The Office of Federal Register (OFR) regulations require that agencies must discuss in the preamble of a final rule the ways that the materials incorporated by reference are reasonably available to interested parties and where interested parties can obtain the materials. In addition, OFR regulations require that the preamble of a final rule summarizes the material incorporated by reference.

Section 26.302(a) and (b) of the regulations adopted herein incorporate by reference Annex J, Guidance for Determination of Necessary Bandwidth, and Annex M, Measurement Standards, of the National Telecommunications and Information Administration (NTIA) Manual of Regulations and Procedures for Federal Radio Frequency Management (NTIA Manual), January 2023 Revision (of the January 2021 Edition). The information in these annexes provide guidance for determining the necessary bandwidth and the measurement requirements for the unwanted emission mask of space launch radiocommunication systems. Interested parties may inspect a copy of the NTIA Manual at the FCC’s main office, 45 L Street NE, Washington, DC 20554; email: [oetinfo@fcc.gov](mailto:oetinfo@fcc.gov). The NTIA Manual is also available online at <https://www.ntia.gov/publications/redbook-manual>.

## Synopsis

As discussed in greater detail below, the Commission continues its efforts to provide regulatory certainty and additional spectrum to promote innovation and investment in the United States commercial space launch industry.

### **Non-Federal Allocations for the 420–430 MHz, 2025–2110 MHz, 2200–2290 MHz, and 5650–5925 MHz Bands**

Taking into account the record, the Commission finds sufficient support and justification for adopting an allocation for the 2025–2110 MHz band and expanding the previously adopted 2200–2290 MHz band allocation. Given that use of the 420–430 MHz, 2360–2395 MHz, and 5650–5925 MHz bands remains limited, the Commission is not convinced there is need for new allocations for any of these bands at this time.

*Allocation for the 420–430 MHz band.* The 420–430 MHz band is used during launches from Federal launch sites to transmit a flight termination signal to a launch vehicle, resulting in its self-destruction if necessary. While there was support on the record for adding this allocation, commenters differed in their suggested use of the band. Boeing suggest that the Commission restrict use of the band to only pre-launch testing and launches to prevent ancillary uses from interfering with safety-of-life transmissions. The United Launch Alliance (ULA), the Aerospace Industries Association (AIA), and the Industry Coalition Response (ICR), however, support flexible use of the band beyond the proposed self-destruct transmissions. Federal incumbents in the band also had differing opinions on adding the allocation to the band. The National Aeronautics and Space Administration (NASA) supports the allocation, if use of the band is limited and Federal incumbents are properly protected. The Department of Defense (DoD) does not oppose adopting such an allocation; however it recognizes that high power radar systems across the country could interfere with the reception of termination signals.

The Commission concludes not to adopt a primary non-Federal Aeronautical Mobile allocation for the 420–430 MHz band. The FCC has not received any special temporary authorities (STAs) to use this band during space launches, as most current launch facilities have Federal systems in place for flight-termination purposes. Additionally, as ULA correctly observes, alternative flight-termination solutions for errant launches are already being

implemented. For these reasons, and in light of the present and potential future limitations on use of the band raised by commenters, the Commission is not adopting the proposed allocation.

*Allocation for the 2025–2110 MHz band.* The 2025–2110 MHz band is currently allocated for both Federal and non-Federal fixed and mobile uses. The Broadcast Auxiliary Service (BAS) makes up most of the non-Federal use of the band and share the band with the Cable Television Relay Service (CARS) and the Local Television Transmission Service (LTTS). The band is also allocated on a primary basis for Federal space operation, Earth exploration satellite, and space research uses. While Federal use of the band is allocated on a co-primary basis, Federal use must not constrain BAS, CARS, and LTTS deployment. The 2025–2110 MHz band also includes primary Federal fixed and mobile allocations with use restricted to the military services, in order to facilitate relocation of military operations from the 1755–1780 MHz band. Federal use of the band has continued to increase, but coordination with non-Federal users has been successful. This success is due in large part to the memorandum of understanding (MOU) created by broadcast incumbents and the Federal users. The Commission has issued many STAs in this band allowing space launch operations to transmit control signals to launch vehicles. The further notice of proposed rulemaking (*FNPRM*) (86 FR 30860, June 10, 2021) sought comment on adding a co-primary non-Federal space operation (Earth-to-space) allocation to the 2025–2110 MHz band, in order to provide the space launch industry's increased use of the band with regulatory certainty.

There was overwhelming support on the record for adopting the proposed allocation. While there was disagreement on the type of restrictions that should be adopted, all commenters were in agreement that any potential space launch operations in the band must be coordinated with all incumbents. According to NTIA, given the important missions of Federal agencies in the band it is important for all Federal users to maintain priority and for all commercial launches to remain subject to prior coordination.

The Commission concludes that adopting a non-Federal secondary allocation for space launch operations with the same coordination requirements that currently apply to Federal users will sufficiently address the regulatory needs of the commercial space launch industry while ensuring the protection of incumbents. This

spectrum is regularly used by commercial space launch providers and granting regulatory certainty will boost investment and promote innovation in this industry. Adopting this allocation will eliminate the time and expense required for seeking STAs, which also often lapse due to the need to reschedule launches, thus requiring multiple STAs per launch. Based on the Commission's experience with STAs in this band, the Commission believes the existing coordination requirements, already proven to facilitate frequency reuse and coordination, will sufficiently protect incumbents and readily grant launch providers access to spectrum. The Commission appreciates the concerns raised by the Federal agencies and are following their suggestion to adopt a secondary allocation instead of a primary allocation as proposed. While Federal space operations have primary allocation status, the restrictions on Federal operations to protect the long-established BAS and CARS licensees in the band in effect relegate the Federal space launch activities as secondary to these Commission licensees. As the commercial space launch providers will also have to coordinate with these terrestrial licensees, a secondary allocation appears to be more appropriate at this time. The coordination framework currently in place for Federal space operations has permitted a high degree of spectrum efficiency and reuse for non-Federal and Federal operations. Adopting a secondary non-Federal Space Operation allocation for the 2025–2110 MHz band will allow the Commission to develop effective rules for the space launch industry, no longer requiring the lengthy experimental rules process. Hence, the Commission is implementing this secondary non-Federal Space Operation (Earth-to-space) allocation to the 2025–2110 MHz band in the U.S. Table. This allocation will be limited to space launch telecommand transmissions and will require commercial space launch providers to coordinate with non-Federal terrestrial licensees (*i.e.*, BAS, LTTS, and CARS) and NTIA.

While there was support on the record for making the band available for use for on-orbit service (OOS) and rendezvous and proximity operations (RPO), the Commission agrees with Boeing that the increased use of the band from the ongoing relocation of Federal operations provides reason to exercise caution in authorizing any additional non-Federal space operations. The Commission therefore will address these operations through separate actions, taking into

account also the record developed in response to the Commission's Notice of Inquiry on In-space Servicing, Assembly, and Manufacturing (ISAM) (87 FR 56365, September 14, 2022). The Commission also does not agree with the National Association of Broadcasters (NAB) and Society of Broadcast Engineers, Inc. (SBE) that space launch operations in the band should be limited to specified geographic sites because the coordination requirement the Commission is adopting will ensure BAS, LTTS, CARS licensees in all geographic areas are protected from harmful interference.

*Allocation for the 2200–2290 MHz Band.* The 2200–2290 MHz band is used for launch telemetry—*i.e.*, sending diagnostic information from the space launch vehicle to ground controller stations during the launch to allow tracking of the performance of the launch vehicle. The 2200–2290 MHz band is heavily used by DoD and other Federal agencies and has primary Federal Space Operation, Earth Exploration Satellite, Fixed, Mobile, and Space Research allocations. The *Report and Order* (86 FR 33902, June 28, 2021) added a non-Federal secondary Space Operation (space-to-Earth) allocation to the band. Use of this allocation is limited by an Allocation Table footnote to pre-launch testing and space launch operations and coordination with NTIA is required prior to each launch. In addition, non-Federal space operations are restricted to the 2208.5–2213.5 MHz, 2212.5–2217.5 MHz, 2270–2275 MHz, and 2285–2290 MHz portions of the band.

The *FNPRM* proposed to remove the restriction on non-Federal use of the new Space Operation allocation to the four sub-bands and asked whether non-Federal use of the band should continue to be limited to channels with a necessary bandwidth of 5 megahertz. The *FNPRM* also sought comment on upgrading the secondary Space Operations allocation to a primary allocation noting that this would place commercial launch operators on an equal footing with other users of the band and provide greater certainty to incentivize investment as the commercial space industry continues to expand with more frequent launches, privately developed launch facilities, and manned space flights. The *FNPRM* also sought comment on adding a secondary Mobile allocation to the 2200–2290 MHz band and whether use of the Mobile allocation should be subject to the same restrictions that apply to the non-Federal Space Operations allocation for the band and whether it should be subject to the same

restrictions that apply to Federal users—*i.e.*, should it be restricted to line-of-sight use only, exclude flight testing of manned aircraft, and prohibit the introduction of high-density mobile systems.

The *FNPRM* noted that use of the secondary Space Operation allocation for the band is limited compared to what would normally be permitted under a Space Operation allocation. The Space Operation Service is defined in the Commission's rules as being “concerned exclusively with the operation of spacecraft, in particular space tracking, space telemetry, and space telecommand.”

Comments from the commercial space industry overwhelmingly support removal of the restrictions on non-Federal use of the band for launch operations. However, Boeing expressed some reservations. Federal agencies such as NASA, DoD, and the Department of Commerce (DoC) strongly oppose any changes to the restrictions on non-Federal use of the band. NTIA states that expanding the scope of non-Federal use of the band would worsen coordination efforts in an already heavily congested band. The Federal agencies also did not support upgrading the secondary non-Federal Space Operation allocation to primary status.

The Commission concludes that it is appropriate to provide commercial space launch operators with access to a greater portion of the 2200–2290 MHz band beyond the four sub-bands currently provided. Most of the STAs that the Commission has issued for space launch telemetry in this band have regularly included use of channels that are outside of these four sub-channels. As all of these STAs have been coordinated with NTIA this indicates that coordination of use of channels outside of these sub-bands is achievable and that limiting use of 2200–2290 MHz for commercial space launches to these sub-bands does not fully meet the needs of the commercial space launch industry. Therefore, the Commission is removing the restriction of use of the non-Federal space operation allocation to the four sub-bands.

However, the Commission will not upgrade the secondary non-Federal Space Operation allocation for the 2200–2290 MHz band to a primary allocation. When the Commission adopted the current secondary allocation for the band, the Commission noted that this would accomplish many of the goals it had sought to accomplish with the proposed primary allocation such as enabling the Commission to adopt service rules and issue spectrum

authorizations, reduce the uncertainty of the launch-by-launch STA process, and permit the development of well-defined technical rules that licensees can design equipment to comply with. The Commission noted that even if it had adopted a primary non-Federal allocation for this band, individual launches would still need to be coordinated because of the heavy existing Federal use of the band. The Commission continues to believe for these same reasons that the current secondary allocation will meet the needs of the commercial space industry. The Commission is cognizant of the complications of sharing this band with the large number of Federal operations and the expressed preference of Federal agencies to maintain the current secondary allocation. In recognition of the need to work closely with the Commission's Federal partners in managing the use of this band, the Commission finds that maintaining the current secondary allocation as advised by NTIA is appropriate at this time.

The Commission will add a secondary Mobile allocation to the band. Providing this Mobile allocation will facilitate the Commission adopting technical rules for space launch telemetry that follow the same approach that NTIA applies to Federal launches. NTIA treats telemetry systems during the first stage of a launch as an aeronautical mobile system and the second and later stages as a space operation system. Because many launch vehicles are used for both Federal and non-Federal launches and many non-Federal launches occur at Federal launch facilities, the Commission believes it is important to have the flexibility to adopt technical rules that are in harmony with the technical standards applied to Federal launches. The secondary Mobile allocation the Commission is adopting for this band will be subject to the same restrictions as the non-Federal Space Operation allocation in the band. The non-Federal Mobile allocation will be restricted to use during pre-launch testing and space launch operations and subject to coordination for each launch. The only opposition to adding a Mobile allocation to the band came from Boeing, who expressed concern that adopting the Mobile allocation would prompt interest in making the band available for 5G and other future mobile services. Given the heavy restrictions on non-Federal use of this band the Commission does not agree with Boeing that it will be considered a candidate for commercial mobile use.

The Commission will not remove the current limitation on use of the non-Federal Space Operation allocation to

pre-launch testing and space launch operations at this time. The heavy use of the band by Federal agencies necessitates that the Commission takes a cautious approach to making provisions for additional use cases of this band. While several commenters such as Northrup Grumman and Axiom expressed interest in using this band for on-orbit activities, the record is sparse as to the technical details of these types of operations. The Commission does not currently have the information needed to reach a conclusion as to the impact of these operations on Federal users of the band.

*Allocation for the 5650–5925 MHz Band.* The 5650–5925 MHz band is used for radar tracking of launch vehicles. During a launch, a radar transponder located on the launch vehicle is typically used to transmit tracking information down to the tracking station. A primary Federal allocation limits use of radiolocation services to military operations. Prior space launches that have used this band have relied on Federal facilities to provide tracking for launches occurring at Federal ranges. The band is also used by Unlicensed National Information Infrastructure (U-NII) devices operating under the Commission's part 15 rules. The 5850–5925 MHz portion of the band has a primary non-Federal Mobile allocation limited to the Intelligent Transportation System radio service. While commercial use of the band remained limited at the time, the *FNPRM* sought comment on whether to adopt a non-Federal Radiolocation allocation for the 5650–5925 MHz band by adding a footnote to the U.S. Table. Of the few comments addressing this topic, there was no consensus on the record for adopting this allocation.

Based on the record, the Commission concludes not to adopt a non-Federal Radiolocation allocation for the 5650–5925 MHz band. While there was support for adding the allocation from some commercial space launch entities, interest in using the band remains low. Commenters failed to provide information on the number of launches likely to need access to this band in the future or other information requested in the *FNPRM*. In recent years only a small number of launches have obtained access to this band for radar transponders using STAs. As there has been limited use of this band in the past and the Commission has no reason to believe this will change in the future, there is no clear need to adopt this allocation. If space launch operators need access to this band for radar transponders, they may continue to use the STA process.

### **Licensing and Technical Rules for Space Launch Operations**

The Commission also adopts rules for the new commercial Space Launch Services. These rules flexibly, efficiently, and effectively support the evolving spectrum requirements of commercial space launch operations while continuing to protect vital Federal operations in the 2025–2110 MHz and 2200–2290 MHz bands. The Commission installs a licensing framework that will grant nationwide, non-exclusive licenses to non-Federal entities that conduct space launch operations in the 2025–2110 MHz and 2200–2290 MHz bands. The Commission also adds a new part 26 to its rules that codifies the rules the Commission adopts in the *Second Report and Order* for space launch operations as well as any related rules that it may adopt in the future for other types of space activities. In addition, the Commission adopts rules defining the scope of the service it establishes in the *Second Report and Order*, as well as the types of entities that will be eligible to hold licenses in the new commercial Space Launch Services. Finally, the Commission adopts specific licensing rules governing shared frequency use, authorized bandwidth, license term and renewal, application processing rules, and coordination requirements, as well as technical rules that will foster interoperability of equipment used for non-Federal and Federal launches and rules regarding equipment authorization. In doing so, the Commission recognizes that licensee pre-launch coordination with NTIA may necessitate additional requirements and limitations on non-Federal launch operations in specific instances, in addition to those it establishes here.

### **Licensing Rules for Space Launch Operations**

#### *Creation of New Rule Part 26*

The Commission creates a new rule part 26 for the new commercial space launch service. The record regarding the question of where to incorporate the rules for space launch operations is mixed, due largely to varying opinions as to the activities that should be included in a space launch operation. The Commission agrees with commenters who argue that a standalone rule part is more efficient and flexible than regulating commercial space launch operations under existing rule parts.

The Commission finds that locating rules into a new part will provide greater clarity and ease of reference regarding commercial space launch

operations. Establishing a rule part specific to these operations rather than placing rules in existing rule parts appears more appropriate given that launch operations, while having elements applicable to parts 87 and 25 depending on the launch, do not fall completely under either one. Creating a new rule part is also forward-looking; as discussed *infra*, while the rules the Commission is adopting here are specific to launch operations, it is seeking additional comment in another rulemaking proceeding on measures that the Commission can take to facilitate more routine licensing for certain payload and space operations. The use of a standalone rule part therefore could be used to accommodate rules relating to other types of space activities to the extent the Commission adopts rules regarding such operations. Accordingly, the Commission finds it appropriate to establish a new part 26.

*Issues Overlapping with ISAM Proceeding.* In the *FNPRM*, the Commission asked multiple questions related to payload communications in the context of space launch operations. For example, the Commission sought comment on whether payload operations, currently addressed through experimental licensing, should be addressed in part 25 of the Commission's rules. Because these newer commercial operations were not considered when many of its rules were first adopted, the Commission sought comment on any modifications to the current part 25 rules (*e.g.*, default rules, bond requirements, fees, etc.) that may facilitate licensing and whether a streamlined process along the lines of the recently adopted process for small satellites would be appropriate for such operations. The Commission also asked if there are other licensing models that can be better suited for the needs of these payload operations. In response many commenters in this proceeding raised issues related to space operations such as on-orbit servicing (OOS), rendezvous, proximity space operations (RPO), Earth-escape operations, and lunar orbit missions, to name a few. Several of the leading industry operators for these types of activities, while urging the Commission to develop rules to better account for such space activities, suggested that these issues should be considered in a further notice of proposed rulemaking.

The Commission notes that many of the same operators that have commented on the need for spectrum allocation and licensing procedures for novel payload activities in this proceeding have also responded to the Commission's Notice of Inquiry on

ISAM in the ISAM proceeding. ISAM refers to a set of capabilities that are used on-orbit, in transit, or on the surface of space bodies. Within the category of ISAM, “servicing” includes activities such as use of one spacecraft to inspect another, to dock with other spacecraft and provide support such as maintaining the station in its orbital location in order to extend the period of operations, or to repair or modify a spacecraft after its initial launch. These activities typically include the process of maneuvering close to and operating in the near vicinity of the “client” spacecraft, a set of activities often referred to as rendezvous and proximity operations (RPO). “Servicing” also involves transport of a spacecraft from one orbit to another and debris collection and removal. While the Commission acknowledges that this industry is advancing rapidly, it recognizes the importance and benefit of in-space services that could extend the life of satellites, reduce orbital debris, and more. The Commission agrees with commenters that it should not attempt to shoehorn these activities into a space launch licensing regime, nor is it necessarily appropriate to attempt to fit these operations into rules “designed for a previous space age.” Accordingly, the Commission will continue to expand the record on these in-space operations through its ISAM proceeding and welcomes continued comment and dialogue from the regulated community as the Commission seeks to develop short and long-term regulatory procedures for these operations.

### Scope of Service

In the *FNPRM*, the Commission sought comment on how to define certain key terms for purposes of licensing commercial space launch operations, including “space launch operations,” “space launch vehicle,” and “reentry vehicle.” The Commission also sought comment on an appropriate scope for the commercial use of the 2200–2290 MHz and 2025–2110 MHz bands.

*Space Launch-related Definitions.* In requesting comment on how to define non-Federal “space launch operations,” the *FNPRM* noted that the STAs that have previously been granted have included telemetry from the launch vehicle and the payload, during the initial space launch, recovery of the booster, and the orbital and re-entry phases for operations such as cargo and crew delivery to and from the ISS. The Commission asked whether it would serve the public interest to include all of these operations in the definition of “space launch operations,” and whether

there is a need to either limit the definition or further expand the definition to other space operations. Commenters are divided on whether “space launch operations” should encompass payload and expanded in-orbit operations, such as rendezvous and proximity operations, ISS docking, and space-to-space links.

While the Commission seeks to implement rules that will provide greater certainty and streamline access and use of the 2200–2290 MHz and 2025–2110 MHz bands, the Commission also remains cognizant that the two bands are already heavily encumbered and that there is a need to proceed cautiously regarding access to the bands for activities that go beyond the operations of a launch vehicle. Accordingly, the Commission finds that it is appropriate at this juncture to limit the definition of commercial space launch operations to activities associated only with the launch and recovery or reentry of a launch vehicle, and exclude payload and other on-orbit communications. The Commission concludes that the inclusion of payload and on-orbit operations, such as rendezvous and proximity operations, ISS docking, and space-to-space links, are outside of what can fairly be considered “space launch operations.” The Commission agrees with Boeing that such ancillary operations are outside the scope of the launch operations addressed in the *FNPRM*. The Commission therefore declines to extend the concept of commercial space launch beyond the operations of a launch vehicle itself. Because it is not clear from the record that the bands at issue can support streamlined authorization and access for payload and on-orbit operations today, the Commission is seeking further comment on these issues in the *Second FNPRM* (89 FR 6488, February 1, 2024) and through the Commission’s ISAM proceeding, noted above.

Instead, the Commission finds it appropriate to adopt a definition of “space launch operations” that is specific to launch vehicle operations. The Commission defines non-Federal “space launch operations” as any activity that places a launch vehicle, whether an expendable launch vehicle or a reusable launch vehicle or a reentry vehicle used for launch, and any payload or human being from Earth in a suborbital trajectory in Earth orbit, or otherwise in outer space, including pre-launch testing and recovery or reentry of the launch vehicle. The Commission finds it appropriate to broadly define “space launch operations” instead of including in the definition an

exhaustive list of permissible operations or defining a launch by stages given that operations may vary from launch to launch. This definition is similar to the broad definition that the Commercial Space Launch Act, as amended, and the Federal Aviation Administration’s (FAA) commercial space transportation rules apply to “launch.”

In the *FNPRM*, the Commission sought comment on whether and how to define “launch vehicle” for space launch operations purposes. SpaceX and TechFreedom advocate for the Commission to make use of its existing part 2 definition of “spacecraft.” NASA disagrees, arguing that a launch vehicle does not constitute a spacecraft, making the Commission’s part 2 definition inapplicable.

The Commission agrees with NASA that the term “spacecraft” is not appropriate. The term would not cover certain launch operations, such as first stages that do not go beyond the major portion of Earth’s atmosphere or suborbital launches, but yet would encompass other activities, such as on-orbit missions, that the Commission is not including as part of a launch operation at this juncture. Instead, in line with the Commission’s definition of “space launch operations,” it defines “launch vehicle” more specifically as a vehicle built to place a payload or human beings from Earth in a suborbital trajectory, in Earth orbit, or otherwise in outer space.

In seeking comment regarding the appropriate definition for “launch vehicle,” the *FNPRM* asked whether the Commission should draw on the definitions of “expendable launch vehicle” and “reusable launch vehicle” under part 87, and also sought comment on whether there should be any distinction between a “launch vehicle” and a “reentry vehicle” for space launch purposes. Few commenters addressed these issues. SpaceX and Relativity urge the Commission to avoid drawing distinctions that may become technologically outdated, while NASA states that the existing part 87 definitions for “expendable launch vehicle” and “reusable launch vehicle” are appropriate. As implied in the Commission’s definition for “space launch operations,” it finds that a launch vehicle could be an “expendable launch vehicle,” a “reusable launch vehicle,” or a “reentry vehicle” used for launch. Accordingly, it is necessary for the Commission to define those terms. While § 87.5 of the Commission’s rules provides definitions for “expendable launch vehicle” and “reusable launch vehicle” in the context of launches administered under part 87, these

definitions describe such launch vehicles as “booster rockets.” Because the part 87 definitions may not adequately capture the launch vehicles that are in use today (or in the future), the Commission instead finds it appropriate to adapt definitions for launch vehicles using definitions from the FAA’s commercial space transportation rules. The Commission defines “expendable launch vehicle” as a launch vehicle whose propulsive stages are used only once, and “reusable launch vehicle” as a launch vehicle that is designed to return to Earth substantially intact and may be launched more than one time or that contains vehicle stages that may be recovered by a launch operator for future use. Because it is feasible for commercial operators to conduct operations with a vehicle that cannot be solely described as a reusable launch vehicle (for example, the vehicle has the ability to be used for purposes other than launch), the Commission finds it appropriate to also include “reentry vehicle” and to adopt a definition similar to the FAA’s definition of “reentry vehicle” as a vehicle designed to return from Earth orbit or outer space to Earth substantially intact. The Commission notes that because “reentry vehicle” under this definition could be applicable to either a launch vehicle or spacecraft designed to be capable of reentry, the Commission specifies that a reentry vehicle is regarded as a launch vehicle in the context of a space launch operation only to the extent that it is being used for launch purposes.

**Permissible operations.** In the *FNPRM*, the Commission noted that the *Report and Order* limited non-Federal use in the 2200–2290 MHz band to telemetry and tracking operations of launch vehicles during pre-launch testing and launch operations. Because the 2200–2290 MHz allocation was originally limited to the 2208.5–2213.5 MHz, 2212.5–2217.5 MHz, 2270–2275 MHz, and 2285–2290 MHz sub-bands, the *FNPRM* sought comment on whether the Commission should remove any presumptive limitation to the four sub-bands in the service rules to the extent that the Commission permits use beyond the original four sub-bands. Further, the *FNPRM* also proposed to restrict the commercial launch use of the 2025–2110 MHz band to telecommand uplink transmissions from the ground controller stations to the space launch vehicle. Noting the heavy usage of this band by BAS, CARS, and LTTS operations, as well as by Federal entities for space operations, Earth exploration satellite, space research,

fixed, and mobile uses, the *FNPRM* asked whether it is feasible to accommodate uses in addition to the space launch telecommand uses.

The Commission will clarify in its service rules that the use of the entire 2200–2290 MHz band is permissible for all launch vehicle-to-ground communications associated with telemetry and tracking operations, and the 2025–2110 MHz band is available for all ground-to-launch vehicle telecommand uses necessary to support space launch operations. As discussed above in section III.A., the Commission is revising Footnote US96 to enable use of the entire 2200–2290 MHz band. Accordingly, the Commission finds that it is necessary to also make clear in its service rules, in addition to the changes made to Footnote US96, that space launch telemetry activities are permitted throughout the band.

Further, given that the 2025–2110 MHz band is heavily used, the Commission finds it necessary to limit the band to telecommand operations. Given the increasingly heavy use of the 2025–2110 MHz band and the importance in ensuring that incumbent operations are adequately protected, the Commission finds that it should not expand space launch uses beyond telecommand for this band.

Permissible uses for the 2200–2290 MHz and 2025–2110 MHz bands, therefore, will be limited to telemetry, tracking, and command activities for space launch operations. Telemetry, tracking, and command necessary to support space launch operations may include, but are not limited to: (1) pre-launch testing, such as pre-flight checks, ground testing, and telemetry; (2) vehicle tracking, including the transmission of parameter data from a launch vehicle to ground; (3) telecommand signals for propulsive maneuvering of a launch vehicle and separation of payload from launch vehicle; and (4) telecommand signals for propulsive maneuvering of a reentry vehicle for return and recovery.

The Commission emphasizes that these telemetry, tracking, and command communications are authorized only during space launch operations as defined above. This includes preparation for launch, launch of the launch vehicle, the launch vehicle’s flight path, release of payload, and recovery or reentry of the launch vehicle. On-orbit communications after a launch vehicle separates from its payload are outside the scope of the service the Commission adopts today. The Commission recognizes that there may be circumstances where telemetry, tracking, or command activities may be

necessary for the incidental orbital period of a launch vehicle before or after it has separated from its payload. The Commission will allow such incidental use only to the extent necessary to successfully complete a launch operation. However, incidental use must be limited only to the extent necessary, and communications on these frequencies that are not related to space launch operations as defined are not permitted.

**Launch Vehicle-Satellite Communications.** In the *FNPRM*, the Commission sought comment on the possibility of authorizing communications between space launch vehicles and satellite systems used for data relay, noting that radios designed as earth stations for communications with the Globalstar or Iridium satellite systems have been used on space launch vehicles in order to utilize those systems for data relay, including for telemetry, tracking, and command (TT&C) purposes. Given this, the Commission asked whether these types of operations should continue to be licensed on an experimental basis. In response to these questions, Globalstar asserted that authorization for these types of operations in the L-band at 1610–1626 MHz should continue on an experimental basis only, given the limited number of launch vehicle customers and limited nature of the message traffic. Several other commenters generally voiced support for allowing such operations, while others noted concerns. The Commission agrees with Globalstar that currently the experimental licensing process serves as an adequate mechanism for licensing these types of communications. As Globalstar points out, current demand for these operations is limited.

### Eligibility

In the *FNPRM*, the Commission sought comment about the appropriate eligibility criteria for holding commercial space launch licenses. The Commission proposed to use the supplemental eligibility criteria for part 87 flight test stations as a model for eligibility criteria.

After reviewing the record, the Commission adopts a modified version of the part 87 model and *FNPRM* proposal. Specifically, in order to be eligible to hold a commercial space launch license, an applicant must qualify as one of the following: a non-Federal entity that conducts space launch operations, or a parent of such entity or a subsidiary of such entity if either conducts space launch operations. Commenters expressed unanimous support for providing

eligibility for commercial space launch licenses to those individuals and entities that conduct space launch operations.

The Commission declines to extend eligibility at this time to educational institutions and persons engaged in the design, development, modification, and flight test evaluation of a launch or reentry vehicle or launch or reentry vehicle components, as proposed in the *FNPRM*.

Commenters expressed concerns over extending eligibility in this fashion, arguing, for example, that such operations would be difficult to monitor and control. Given the congested nature of the bands at issue, the Commission opts to limit eligibility for permanent authorization at this time to only those entities that conduct commercial space launch operations, as recommended by NTIA/NASA. The Commission may revisit its eligibility criteria in the future, if needed.

The Commission also declines to require commercial space launch license applicants to include a separate certification with their application to establish eligibility. As Boeing observed, license applicants using Form 601 already must certify as to their eligibility to hold the license for which they are applying. General Certification Statement 7 on Form 601 requires the applicant certify that “it has reviewed the appropriate Commission Rules defining eligibility to hold the requested license(s), and is eligible to hold the requested license(s).” The Commission concludes that requiring a separate eligibility certification would be a superfluous requirement for license applicants.

#### **Shared Frequency Use and Cooperative Use of Facilities**

Consistent with the Commission’s decision to allocate the 2025–2110 MHz band for commercial space launch operations on a secondary basis and modify the allocation of the 2200–2290 MHz band, the Commission adopts its proposal to provide non-Federal space launch operators access to both bands on a shared, non-exclusive basis. The Commission understands that these allocations will be used by space launch operators to conduct telemetry, tracking, and command operations of launch vehicles during pre-launch testing and space launch operations and that they will more than often be working with the same launch site operators given the finite number of suitable launch sites. As the Commission noted in the *FNPRM*, given the potential for many different launch vehicle operators to use a given launch facility, authorizing

commercial space operations on a shared and cooperative basis appears to be a reasonable approach for providing spectrum access to multiple space launch entities. The Commission finds therefore that providing access on a shared, non-exclusive basis will offer the burgeoning commercial space launch industry a more predictable, collaborative, and flexible means of gaining access to spectrum, one that will provide greater regulatory certainty and foster continued growth in this sector. The Commission’s decision is supported by the record in this proceeding as the majority of commenters filed in support of spectrum sharing on a non-exclusive basis through the use of coordination techniques.

The Commission received few responses to the question raised in the *FNPRM* regarding whether it should adopt a non-discrimination policy for all space launch operations similar to the rule imposed by the part 87 rules on access to flight test facilities and none of these commenters support imposing such a requirement. The Commission agrees with Boeing that the cooperative use of space launch facilities are more appropriately addressed through the use of private contractual arrangements and will not impose a non-discrimination policy in this context. Moreover, because the Commission grants licenses on a shared, non-exclusive basis at a nationwide level, the Commission will not be issuing only a single site-based authorization per launch site, which, as SpaceX points out, obviates the need for the Commission to adopt a non-discrimination requirement because launch vehicle operators will have other sites around the country to choose from.

#### **Licensing**

In the *FNPRM*, the Commission indicated that its goals in licensing space launch operations are two-fold: (1) to encourage innovations and investments in the U.S. space commerce; and (2) to ensure a regulatory environment conducive to the establishment of a competitive U.S. commercial space launch sector while protecting Federal and other users in the bands. To meet these goals and to facilitate the shared spectrum access approach discussed above, the Commission will issue space launch licenses on a nationwide, non-exclusive basis.

The Commission sought comment on various licensing models with the aim of providing regulatory certainty in the marketplace while minimizing administrative burdens and duplicative regulations. Specifically, the Commission asked commenters whether

it should consider applying a site-based licensing model in a shared use situation as fixed, well-defined areas of operation can simplify coordination during the application process for services requiring frequency coordination, and facilitate intensive spectrum sharing. The Commission also suggested that a site-based approach would enable stakeholders to identify quickly licensees in the band and their specific areas of operation in the event interference issues arise thus allowing parties to resolve such issues in the shortest timeframe practicable.

The Commission also sought comment on other licensing models that may be suitable in the space launch operations context. Among other things, the Commission asked whether it should consider a new approach combining various aspects of space-based services and aeronautical service licensing rules or whether it would be appropriate to license space launch vehicles similar to space stations and their communicating ground/earth stations on a single or multiple site basis. In addition to inquiring about conditioning ground/earth station operations on the filing of a certification that any required frequency coordination has been satisfactorily completed prior to a space launch, the Commission asked whether it could license space launch operations in a manner similar to previous licensing models applicable to certain wireless services such as the 3650–3700 MHz band. In doing so, the Commission sought to provide space launch operators access to various spectrum bands on a non-exclusive, yet protected, basis, subject to measures designed to promote shared use of spectrum, such as a registration and frequency coordination requirement prior to each launch. The *FNPRM* also considered ways to reduce potential administrative burdens and streamline the information that would be needed for initial licensing and then registration and coordination prior to a planned launch.

As discussed above, the Commission finds that space launch access to spectrum on a shared basis is appropriate and finds that permitting such access on a nationwide basis similar to the licensing mechanism established for the 3650–3700 MHz band is also warranted. There is wide support in the record for licensing commercial space launch operations on a nationwide, non-exclusive basis covering related launch vehicles across multiple launch sites. The Commission finds that such an approach will give certainty to licensees and provide the efficiencies of scale and scope that will

spur innovation, investment, and rapid deployment of space launch services.

The Commission also agrees with commenters who assert that a licensing framework based on nationwide, non-exclusive licenses offers a number of distinct advantages over a site-based licensing regime. In short, the record shows that a single nationwide, non-exclusive license offers greater administrative and regulatory efficiencies than either a site-based licensing regime or the arduous STA process, particularly as the volume of commercial space launch activities continues to grow.

Nationwide licensing offers the advantages of a simpler, more streamlined application process that shifts the burden of information collection from the licensing stage to post-licensing site registration and per-launch coordination with the relevant Federal and non-Federal entities. Moreover, nationwide, non-exclusive licensing offers space launch operators the benefit of only having to file a single license to cover a range of different launch sites shared by multiple co-frequency operators, a far more straightforward process than the site-by-site STA process. The Commission agrees with SpaceX that granting a series of authorizations by site, frequency band, and mission phase would create unnecessary burdens and that structuring the license in a comprehensive way enables each launch provider to have a “single, all-in-one authorization” to cover all of its activities thereby obviating the need for multiple licenses to cover different launch sites, different recovery sites, and different launch vehicles.

From an operational standpoint, nationwide licensing offers space launch operators the flexibility to accommodate future expansion in the space launch industry as more launch sites (Federal or non-Federal) are constructed, new and improved launch vehicle technologies are introduced, and the number of licensees operating in the bands continues to grow. As ULA notes, nationwide licensing affords space launch operators the operational flexibility to launch from any U.S. launch site to account for the multitude of variables, including weather delays, payload changes, orbital-path and/or destination shifts, and other “uncontrollable” factors that can affect the location and timing of launches. Such flexibility is critical as launch vehicle operators are not always the same entity as the launch site operator, with variability from launch-to-launch in terms of the entities involved on any

given launch on any given date and time.

Prospectively, nationwide, non-exclusive licensing also could provide the Commission with a strong foundation to build upon as it develops a regulatory scheme that will accommodate space-to-space communications through the record being developed by the *Second FNPRM*. With the input of Federal and non-Federal stakeholders, the Commission anticipates that it will develop a record to determine the best path forward for licensing on-orbit services, including RPO and OOS. As discussed in further details below, the Commission would pair a nationwide licensing scheme with post-licensing coordination to ensure cooperation with and avoid harmful interference to co-frequency entities. Post-licensing coordination under this framework would permit non-Federal licensees who are sharing the frequency bands to address specific areas of operation associated with each specific launch (launch site location and corresponding stations, launch vehicle, in-flight trajectories or coordinates, etc.) in a manner similar to existing coordination processes.

The Commission concludes that the 3650–3700 MHz licensing framework that authorized nationwide, non-exclusive licenses for terrestrial operations on a cooperative shared basis offers a suitable template to license commercial space launch operations in a similar streamlined fashion. The Commission bases this conclusion on the unique nature of the service, including the variability of launches. The Commission agrees with the Satellite Industry Association (SIA) that a modified version of the 3650–3700 MHz licensing model would provide a good licensing framework for space launch operators to obtain nationwide, non-exclusive licenses for shared spectrum use. The Commission also agrees with ULA that it should apply elements of the 3650–3700 MHz licensing framework, including the requirement that operators can obtain a nationwide license only if they agree to cooperate with and avoid harmful interference to co-frequency licensees and cannot commence operations until they register the sites affiliated with their launch service. In the 3650–3700 MHz proceeding, the Commission indicated that nationwide, non-exclusive licenses would serve as a prerequisite for registering individual fixed and base stations, *i.e.*, a licensee cannot operate a fixed or base station before registering it under its license and must delete registrations for unused

fixed or base stations to facilitate proper coordination.

Like the 3650–3700 MHz licensing regime, any space launch operator interested in obtaining a nationwide, non-exclusive license can do so on the condition that they agree to cooperate with and avoid harmful interference to co-frequency entities and complete coordination efforts to avoid in-band interference, including providing the information necessary to conduct coordination via site registration. All commercial space launch licensees in the band will have equal rights to the use of the spectrum as long as they comply with all applicable licensing, service, and operating rules but all the licensees will have a mutual obligation to cooperate and avoid causing harmful interference to other users in the band. Applicant qualification for non-exclusive nationwide wireless licenses in the space launch service will be assessed in accordance with FCC Form 601 and Commission rules. There will be no limit to the number of non-exclusive nationwide wireless licenses that may be granted for the spectrum allocated to commercial space launch services, and these licenses will serve as a prerequisite for registering launch sites and operational parameters, space launch vehicle stations, individual ground/earth stations, and itinerant stations needed to support a launch. The Commission notes that the registration process will be streamlined to the extent possible and will be done electronically through the Universal Licensing System (ULS) as suggested by several commenters. The initial filing date for these commercial space launch licenses, along with directions on how to use the ULS, will be announced in a future Wireless Telecommunications Bureau (WTB) Public Notice. The Commission notes that in order to keep the ULS licensing and registration database for space launch services accurate and up-to-date, the Commission delegates to the WTB the authority to adopt rules regarding the reporting of database information including reporting of any license or secondary markets transactions. WTB will issue a Public Notice seeking comment on these issues, as appropriate.

As stated above, the Commission is hereby creating a new rule part 26 that will set forth the licensing, operation, and service rules for the space launch service. With respect to their regulatory status under the Communications Act, space launch service licensees operating in these shared use bands will be providing services on a non-common carrier basis after they obtain their



licenses and register the launch site and corresponding fixed, base, and itinerant stations as well as mobile stations associated with the launch vehicle to comply with post-license grant coordination requirements. Consistent with the non-exclusive nature of the licensing scheme the Commission is adopting here, it will not impose any spectrum aggregation limits, either in-band or out-of-band, or eligibility restrictions other than the eligibility criteria discussed above and statutory foreign ownership restrictions. All potential space launch service providers will have equal access to these bands and by opening this spectrum to as wide a range of eligible applicants as possible, the Commission aims to encourage new entry and investment as well as entrepreneurial efforts to develop new launch-related technologies and services, while helping to ensure efficient spectrum use. The Commission further believes that this approach will promote economic opportunity and competition in the subject bands. The Commission will not impose a performance or build-out requirement because space launch sites and launch vehicles may vary from launch to launch, making specific construction requirements impractical. Of course, any interested party is free to, depending on the site, construct facilities and may operate according to its particular business plan at any time, as long as it has a valid wireless license, registers its stations, and complies with coordination requirements as well as other applicable rules. However, the Commission strongly expects space launch service providers to consult with NTIA in advance of commencing construction on a new launch site. The Commission concludes such a consultation is in the provider's best interest, as providers will have the information needed from NTIA to make an informed decision about whether to proceed with construction at a given site. Although the Commission does not impose a performance requirement, it will require that space launch licensees delete registrations for unused sites and unused fixed, base, itinerant, and mobile stations in order to maintain ULS database integrity and facilitate efficient coordination between licensees.

Any eligible party may apply at any time for a license in these frequency bands regardless of the presence of other licensees in the geographic area where it intends to use the spectrum and licensees may assign or transfer their non-exclusive nationwide authorizations, upon application to and

prior approval from the Commission. However, the Commission's decision to license the space launch services on a non-exclusive nationwide basis obviates the need to adopt partitioning and disaggregation provisions because partitioning and disaggregation is only pertinent in geographic licensing settings where the licensee has *exclusive* use of a particular area. For similar reasons, the Commission need not make its spectrum leasing rules applicable to licensees because the non-exclusive licensing scheme the Commission employs here, coupled with the required post-license coordination, permits a high degree of access and spectrum re-use in these bands by multiple users, while minimizing the likelihood of harmful interference. Accordingly, the spectrum leasing arrangements described in the *Secondary Markets Report and Order* (68 FR 66252, November 25, 2003) are not applicable, and the Commission does not see a need to apply those spectrum leasing rules and policies to this spectrum at this time.

#### Authorized Bandwidth

In the *FNPRM*, the Commission proposed to grant licenses for commercial space launch operations using a 5 megahertz bandwidth for the 2200–2290 MHz band and sought comment on the appropriate bandwidth for the 2025–2110 MHz band. The Commission also sought comment on whether to permit licensees to use larger bandwidths upon adequate justification, and also on whether to authorize operations using a range of bandwidths instead of a fixed bandwidth of 5 megahertz. After reviewing the record, as well as the space launch operations the Commission has licensed on experimental bases to date, the Commission will issue licenses of any bandwidth a licensee chooses, up to 5 megahertz, for both bands. In the event a licensee requires a bandwidth greater than 5 megahertz, the Commission will authorize a bandwidth exceeding 5 megahertz upon adequate justification for why such bandwidth is necessary for space launch operations in a particular launch. For purposes of such requests, licensees must demonstrate that the bandwidth requested is that which is necessary to accomplish the specific telemetry, tracking, or command operation(s) at issue. This framework is similar to the Commission's licensing of the 2360–2395 MHz band space launch telemetry and telecommand operations, which are licensed on a range of bandwidths capped at 5 megahertz, with larger bandwidths available on a case-by-case basis.

Given that the majority of requests for experimental licenses for the 2200–2290 MHz band to date have requested bandwidths smaller than 5 megahertz, the Commission finds it appropriate to impose a 5 megahertz maximum bandwidth limitation. In light of the existing usage of this band, the Commission finds it appropriate to limit the authorized bandwidth to only that which is generally necessary for a launch. The Commission notes that the limit for Federal space launches using the 2200–2290 megahertz band is 5 megahertz, and NASA supports applying a 5 megahertz maximum bandwidth to non-Federal launch operations as well. While there was limited discussion in the record regarding the appropriate bandwidth limit for the 2025–2110 MHz band, NOAA notes that Federal entities are limited to a maximum bandwidth of 5 megahertz in both the 2025–2110 MHz and 2200–2290 MHz bands in order to reduce congestion and to ensure compatibility with existing operations. The Commission concludes that it would be appropriate to apply a 5 megahertz limit to non-Federal uses of the 2025–2110 MHz band for these reasons as well. While some industry commenters advocated for an authorized bandwidth exceeding 5 megahertz, the Commission finds that a 5 megahertz limit for both the 2025–2110 MHz band and the 2200–2290 MHz band will help to lessen impacts to other users in these bands, and put commercial space launch operators on par with Federal entities as well as those using the 2360–2395 MHz band for launch operations. And as explained below, the Commission is allowing licensees to exceed the 5 megahertz bandwidth to the extent they can demonstrate such additional bandwidth is necessary for a given launch.

Further, the Commission finds that allowing licensees to choose their own bandwidth, up to 5 megahertz, will provide licensees with the flexibility to undertake a variety of commercial space launch activities, including future industry developments. No commenters opposed this approach, while NASA supports allowing non-Federal users to use any bandwidth up to and including 5 megahertz, noting that the narrower emissions will be easier to coordinate with existing Federal users. For those reasons, the Commission will allow licensees to choose a bandwidth of any size, up to 5 megahertz.

While the Commission finds that it should impose a maximum bandwidth of 5 megahertz as a means to help lessen the impact of commercial space launch operations on these bands, the

Commission is aware that there may be instances when wider bandwidths may be necessary for a given launch. The Commission therefore finds it appropriate to permit commercial space launch operators to use bandwidths exceeding 5 megahertz on a case-by-case basis. Several commenters advocate for bandwidths exceeding 5 megahertz. Conversely, NASA argues that authorized bandwidth should be capped at 5 megahertz, arguing that the same restriction applies to Federal users in the 2200–2290 MHz range. However, bandwidths exceeding 5 megahertz in the 2200–2290 MHz band are available to Federal users upon adequate justification. In addition, commercial launches in the 2200–2290 MHz range using bandwidths exceeding 5 megahertz have been successfully coordinated with NTIA in the past. Similarly, as noted, although launch operations in the 2360–2395 MHz band have a limit of 5 megahertz, the Commission's rules permit applicants to seek authorization for wider bandwidths.

Accordingly, for those commercial space launch operators seeking authorizations for bandwidths exceeding 5 megahertz in the 2200–2290 MHz and 2025–2100 MHz bands, the Commission will apply the NTIA framework for such requests. Specifically, the requesting space launch operator shall submit a justification as part of the registration process for a launch on why the requested bandwidth is necessary for the specific TT&C space launch operation, including an explanation of why the operator's requirements cannot be satisfied using a bandwidth of 5 megahertz or less. The applicant's justification will be carefully assessed to determine whether a request for bandwidth in excess of 5 megahertz for a given launch will be granted. Such requests will not be routinely granted given the goal of limiting impacts to other users in the band. As discussed below, all launch operations must be coordinated; the Commission notes that, given the heavy usage of these bands, it may be difficult to successfully coordinate operations involving requests for bandwidths greater than 5 megahertz.

#### License Term and Renewal

The Commission adopts a ten-year license term for commercial space launch operations. In the *FNPRM*, the Commission tentatively concluded that a ten-year term would provide sufficient certainty and flexibility for space launch providers. The Commission has applied ten-year license terms to similar

services, such as part 87 aviation, part 90 radiolocation, and part 90 telemetry and remote control operations. More generally, ten-year license terms are common among the Commission's various wireless services.

Several commenters support the Commission's ten-year term proposal while others advocate for a 15-year license term. The Commission does not agree that a longer 15-year term is necessary for commercial space launch operations. Regarding space stations and earth stations, the operation of satellite communications under part 25 presents a distinct set of factors from space launch considerations, including the scope and extent of deployment. Although the Commission has also adopted 15-year license terms under certain circumstances for non-satellite wireless services, it has done so to address circumstances not present here, such as the complexities surrounding 5G deployment, relocation and repacking of incumbent operations, and support for network expansion and densification. The Commission instead agrees with SIA that a ten-year term is sufficient to provide launch operators with the certainty of a longer license term, and will encourage launch operators to make long-term investments. And while the Commission seeks to provide commercial space launch operators with as much certainty as possible, the Commission also finds it necessary to set timeframes that will enable us to adequately verify that licensees are operating within their authorized parameters. Given the congested nature of the bands at issue, the Commission conclude that such review should take place after ten years, not 15.

Given the heavy use of these bands, the Commission also finds it appropriate to require space launch operators to demonstrate that they qualify for license renewal. In 2017, the Commission harmonized the renewal processes for numerous Wireless Radio Services (WRS). The Commission determined that a site-based WRS licensee would meet the Commission's renewal standard if it could certify that it is continuing to operate consistent with its most recently filed construction notification (or most recent authorization, when no construction notification is required), and make certifications regarding permanent discontinuance and substantial compliance with Commission rules and policies. The Commission also provided that, for geographic-based licenses to qualify for renewal at the end of an initial license term, the licensee must show that it timely constructed to any

level(s) required by the service-specific rules for either provision of service to the public or for the licensee's private and internal needs, and, thereafter, consistent with the Commission's permanent discontinuance rules, continuously provided service or operated at or above the required level(s) for the remainder of the license term. The *WRS Order* (82 FR 41530, September 1, 2017) does not apply to Wireless Radio Services that are licensed by rule or on a "personal" basis or that have no construction/performance obligation.

Because launch operations are dissimilar to most other wireless services, the Commission does not find it appropriate to apply to commercial space launch licensees the same renewal standards that are applied to geographic-based or site-based WRS licensees. Instead, a commercial space launch licensee will be entitled to renewal if it remains otherwise qualified and can certify that (1) it has operated and is continuing to operate consistent with Commission rules and the terms of its existing authorization, and (2) it has complied with the required coordination throughout its license term. Given the nature of space launch operations (for example, there may be significant periods of time between launches), the Commission will not apply discontinuance of operations rules.

Most of those commenting on this issue support a presumptive renewal expectancy and oppose renewal showings. Commenters that oppose the use of a renewal showing claim that one is not necessary given the non-exclusive nature of the band, which, commenters claim, prevents spectrum warehousing by itself. While the Commission agrees that a non-exclusive band presents different considerations from an exclusive licensing regime, the Commission concludes that imposing this requirement will aid us in verifying that space launch entities are operating within licensed parameters, thereby helping to manage use and prevent interference within congested bands. As noted in the *FNPRM*, the Commission concludes that requiring a renewal showing from commercial space launch entities would facilitate efficient spectrum use by ensuring that licensees use the spectrum productively, collaboratively, and in compliance with Commission rules. For that reason, the Commission adopts the aforementioned renewal standard.

#### Application Process

The Commission concludes that it serves the public interest and the

Commission's policy objectives to promote innovation and investment in the United States commercial space launch industry by assigning non-exclusive nationwide licenses for the space launch services which will not result in mutually exclusive applications and therefore will not be subject to the competitive bidding requirements of section 309(j) of the Communications Act. Consistent with the Commission's decision to adopt a non-exclusive nationwide licensing scheme, the Commission will adopt an application process modeled after the 3650–3700 MHz licensing framework to permit space launch operators access to various spectrum bands on a non-exclusive basis, subject to measures designed to promote shared use of spectrum, that will impose a post-license grant frequency coordination and registration requirement prior to each launch.

*Application Form and Licensing Database.* Building on the Commission's decision to utilize a modified version of the 3650–3700 MHz licensing model, it will require space launch operators to apply for and obtain a nationwide, non-exclusive license in ULS. Once licensed, space launch operators, working through a third-party coordinator, must coordinate each launch with NTIA and other non-Federal users, as discussed *infra*. After that per-launch, per-site coordination process has been successfully completed, space launch operators must then register in ULS the technical and operating parameters associated with the coordinated launches. Only after the final technical parameters of a given launch are registered under their license can space launch operators commence their launch service subject to the condition that they re-coordinate a launch if operational details change and agree to maintain and update those registered sites and stations, including deleting any unused or superseded launch site or station information to facilitate coordination. The information required for the application, coordination and registration processes will be identified in a Public Notice.

A number of commenters weighed in on the use of a common database to receive applications for launch operators seeking authorization to provide commercial space launch services and to register terrestrial sites and associated stations. Several commenters advocated for the use of the Commission's existing licensing databases, Universal Licensing System (ULS) or International Communications Filing System (ICFS), and their associated forms and schedules. The

Commission agrees with Boeing that requiring applicants to file FCC Form 601 and its associated schedules through the ULS would be expedient and administratively efficient and notes that the 3650–3700 MHz band upon which it is basing the Commission's licensing approach has been successfully administered through ULS. The Commission therefore declines to use Form 312 and Schedule S and ICFS at this time. While several commenters urged the Commission to consider using FCC Form 312 and Schedule S in the ICFS system in line with part 25 authorizations, the Commission agrees with Boeing that Form 312 and Schedule S would require significant revisions to accommodate space launch licenses, changes that would be difficult to implement with the older ICFS software. The Commission also finds using the ULS database to field applications is consistent with its decision to create a new rule part 26 for the space launch service rather than shoehorning a unique and fast developing service into existing rule parts like part 87, 90, or 25.

*Filing requirements and station registration to facilitate post-licensing coordination with frequency coordinators and NTIA/DoD.* The Commission received only a few comments regarding the information that applicants should provide in an application. The Commission finds that these comments have merit, but that technical data such as frequencies would be most useful for coordinating and registering specific launches. For purposes of applying for the nationwide, non-exclusive license, the Commission finds that it is only necessary for launch providers to provide administrative information and later register data associated with a specific launch operation, such as the name of the launch sites and their latitude, longitude, address, corresponding stations, and area of operation for mobile stations. Indeed, data such as frequencies and technical parameters will vary from launch to launch and are not necessary for assessing an application for a nationwide, non-exclusive license.

The Commission will delegate to the WTB the authority to further review and refine the filing process. As stated previously, the initial filing date for these commercial space launch applications, along with directions on how to use the ULS, will be announced in a future WTB Public Notice. Correspondingly, the Commission also delegates to the WTB the authority to specify application information, to make any necessary modifications to the FCC

Form 601 and its related schedules, including any reprogramming of the ULS software, to accommodate the application and post-license site and station registration and frequency coordination process prior to each launch. The WTB will issue a Public Notice, in consultation with the Space Bureau and Office of Engineering and Technology, seeking comment on these issues, as appropriate, to further refine the Commission's online application process and accommodate frequency coordination.

As discussed *infra*, the Commission will require space launch operators to coordinate every launch with applicable Federal and non-Federal entities. While the WTB after seeking comment will issue a Public Notice identifying information that will be required with respect to the application and coordination processes as well as post-license grant registrations, licensees will likely be expected to provide, at a minimum, the same operational and technical parameters currently required of applicants seeking special temporary authority for their space launches to facilitate post-licensing coordination. The Commission anticipates that licensees will identify requisite site and station information, including the specific coordinates of fixed, base, and itinerant stations (*e.g.*, latitude and longitude), frequency channels, launch trajectories, launch window or planned launch date, and any other technical and operational information (*e.g.*, antenna characteristics, power levels, emission designators, launch vehicle trajectory) needed by a third-party frequency coordinator to submit the launch coordination request to the relevant non-Federal and Federal entities. Other information could include coordinates and operational parameters of the earth/ground stations launch operators will be using to provide service at a particular launch site, including whether the sites are Federal or FAA-licensed commercial spaceports or non-Federal launch sites (*e.g.*, Spaceport America in New Mexico and Mojave Air and Space Port in California). Operators may also be asked to provide any coordination agreements that they have already entered into with co-frequency entities or successfully completed coordination conducted by the designated frequency coordinator. As part of this post-license grant coordination process, launch providers must consistent with the Commission's service rules comply with the continuing obligation to update their licenses to ensure proper coordination. As noted, the WTB Public Notice will

seek comment on collection of this coordination data as well.

*Space Launch Vehicle Operations with Earth Stations Outside the United States.* The Commission agrees with commenters that any launch vehicle operator that requires communication with a foreign earth station must obtain the necessary approvals for operations of the earth station from the appropriate regulatory body in that country.

However, this does not mean that the launch vehicle can be correctly viewed as licensed by that same regulatory body. The Commission is unaware of any International Telecommunications Commission (ITU) Administration that views a U.S. launch vehicle upper stage as a station subject to its licensing (See Article 18.1) simply because it communicates with an earth station within its territory, and similarly this is not the approach taken for non-U.S. launch vehicles communicating with U.S. earth stations. More generally the Commission's current licensing of space stations, including under parts 5, 25, and 97, accounts for space station operations with earth stations outside the United States. The conditions that the Commission places on a satellite license continue to be in effect for the duration of satellite operations regardless of whether the satellite communicates with non-U.S. licensed earth stations, and in some circumstances the space station authorization may involve communications exclusively with earth stations outside the United States.

*Operations Inside the United States with non-United States Space Launch Vehicles.* The commission received limited comments on this issue. The Commission agrees with Boeing that there may not be a current demand for these types of communications. The Commission concludes that it can address any requests for these communications through the experimental licensing process for the time being. The Commission believes this approach addresses Astra Space's comments as well by providing an avenue for operators to seek authorization.

*ITU Process.* Commenters generally oppose requiring submissions to the ITU related to space launch operations. The Commission agrees with commenters that under current circumstances many U.S.-based space launches may not result in the realistic potential for international harmful interference, particularly with respect to the first stage of a launch vehicle or a single stage launch vehicle, for which radio operations may be limited to line-of-sight communications with ground

stations in U.S. territory and occur while the launch vehicle is over oceanic areas. As such, engaging in a filing process with the ITU might be viewed as an unnecessary administrative hurdle, and any interference concerns can be addressed bilaterally with adjacent countries. However, the Commission also recognizes its duty to carry out the United States' treaty obligations as a ratifying member of the ITU convention, and that this includes an obligation to ensure that U.S.-licensed operations do not cause harmful interference on an international scale. This concern is of greater significance for launch vehicle upper stage operations involving earth stations outside the United States, as those operations do present the potential for interference in multiple countries. These competing considerations must be taken into account in determining whether ITU filings should either be uniformly required for licensed part 26 operations, or whether operators should be exempted from such requirements.

A third option is to require applicants to submit appropriate draft documentation for submission to the ITU on a case-by-case basis, as is the current practice, if the scope and nature of the space launch operations would have the potential to cause harmful interference in another country. For example, the Commission may consider requiring a filing if the upper stages of a launch vehicle will be communicating with earth stations outside the United States. This would align the U.S. with the practice of other countries that submit materials to the ITU for upper stage orbital operations. The Commission concludes that this third option is preferable. The Commission will not adopt a blanket requirement that all space launches require an ITU filing, yet it does not preclude its ability to require such a filing in the event the Commission deems that such a filing would be necessary and prudent in order to avoid harmful interference with other countries. The Commission has taken steps to create a flexible licensing regime for space launches under the new part 26, including allowing one launch license to cover multiple launches and nationwide launch locations, and a 10-year license duration. Particularly given the longer-term aspects of the licensing approach adopted, requiring an ITU submission as part of the license application process will not create an undue burden to operators in the event a filing is deemed necessary and appropriate. The Commission also notes that it will be bound by any future ITU requirements

related to space launch filings and so its current position is subject to change upon the issuing of new ITU regulations in this area.

### Frequency Coordination

In the *FNPRM*, the Commission sought comment on the appropriate coordination process between Federal and non-Federal entities to be used prior to the grant of an application for space launch frequencies as well as a coordination process for the ongoing use of these frequencies by operators during their license terms. The Commission also sought comment on whether it should require applicants for a license in space launch frequencies to undergo a pre-application coordination requirement similar to that specified in § 87.305, or whether, in the alternative, the Commission should impose a different coordination process.

As a general matter, all of the commenters in the record support the use of frequency coordination and spectrum deconfliction to prevent harmful interference to co-frequency non-Federal/Federal operations and ensure the efficient use of spectrum in these bands. Where they differ is when the coordination process should take place. While a few commenters argue in favor of a pre-license grant coordination approach, most commenters favor a post-license grant coordination and spectrum deconfliction process. Comments submitted by Federal stakeholders emphasize the importance of coordinating on a case-by-case, launch-by-launch basis to ensure that Federal users in the bands are protected from harmful interference.

Based on the record in this proceeding, the Commission finds that post-license grant coordination will ensure cooperation with and avoid harmful interference to co-frequency entities, both Federal and non-Federal, operating in the 2025–2110 MHz and 2200–2290 MHz bands. The Commission believes that post-license grant coordination in concert with a comprehensive nationwide, non-exclusive licensing regime will provide space launch operators access to the spectrum they need and relief from the administrative burdens associated with either a site-based licensing approval process or the current launch-by-launch STA regime. Post-license grant coordination will also endow them with the operational flexibility to modify their launch parameters (*e.g.*, frequency channels, antenna height, trajectory, power level) closer in time to the launch event and the latitude to adjust their services to accommodate demand as it arises.

The Commission reaches this decision based on the length of the license term (10 years) and a record that demonstrates the complicated logistics surrounding space launch operations, including multi-factored variability of launch elements that are beyond the licensee's control, as well as changes in the operational environment on and around Federal ranges and other sites that are likely to occur over time. On balance, these factors suggest that a one-time pre-licensing coordination would be insufficient to protect co-frequency entities from harmful interference in spectrum bands that commenters suggest are already congested. Moreover, given the anticipated growth of space launch services, the Commission finds that a one-time pre-licensing coordination is unlikely to cover all the space launches that will occur over the life of an operator's license nor would it be able to anticipate the introduction of new launch sites, changes in launch vehicles, or technological innovations that are likely to occur during those ten years. For these reasons, the Commission believes that third-party coordination and spectrum deconfliction would be better executed post-license grant.

Post-licensing coordination affords space launch operators who are sharing these frequency bands (and launch facilities) the opportunity and flexibility to adjust specific areas of operation (site location, launch vehicle, or in-flight trajectories, etc.) as they come up with each individual launch event, particularly as they get closer to the scheduled launch date. For space launch operators seeking launch clearance, it is critically important that their post-grant coordination requests cover the key elements of a launch so they can adequately complete the required per-launch coordination process. Consistent with the Commission's decision to adopt allocation and service rules for space launch services for two distinct bands, 2200–2290 MHz (space-to-earth) and 2025–2110 MHz (earth-to-space), the Commission will adopt a post-license grant coordination approach that takes into account the unique characteristics of these bands. The Commission will also approach coordination in a manner that reflects its decision to apply a modified 3650–3700 MHz licensing framework to grant space launch operators a nationwide, non-exclusive blanket license on the condition that they agree to cooperate with and avoid harmful interference to co-frequency entities and cannot operate launch sites

and corresponding radio stations (earth/ground stations, stations on their launch vehicles, and any associated mobile stations on the ground) until they have first registered them under their license after completion of coordination through a third-party coordinator.

The Commission finds significant efficiencies justifying the use of a third-party frequency coordinator in the bands at issue. Given the variety of non-Federal and Federal stakeholders sharing this spectrum, all with different operational and technical needs, and the administrative burdens licensees face in having to submit to different coordination processes, the Commission finds it prudent to designate a single entity that will serve as both a clearinghouse and as an intermediary in negotiating operational parameters with SBE, NTIA, government automated frequency coordination (AFCs), and co-frequency operators. Currently, space launch operators are tasked with determining the impact of their services on non-Federal and Federal users whose operations may or may not have already been coordinated by SBE to protect BAS, CARS, and LTTS in the 2025–2110 MHz band as well as the effect on co-frequency operators and Federal incumbents that must be protected in both bands. The Commission finds that a single third-party coordinator armed with knowledge of the operational guidelines imposed by prior coordination can cross reference that data with new requests for coordination in real time and act as an intermediary with SBE and NTIA to speed up the review process and thus expedite deployment in the bands. Absent the assistance of a centralized coordinator familiar with the operational and protection needs of non-Federal operators and Federal incumbents as well as the terms of previously completed launch coordination, individual space launch operators will find it far more difficult to navigate the requisite layers of approval in a timely fashion, particularly considering the short turnaround times and multi-factored variability of space launches and the fluctuating needs of Federal users in these heavily trafficked bands. Having a third-party entity perform those duties on behalf of the operators will streamline the coordination process, offer greater flexibility to operators as they approach scheduled launch dates, and ensure protection for incumbent operations against harmful interference.

Accordingly, the Commission hereby adopts a post-license grant coordination regime that will be facilitated by a third-party space launch frequency

coordinator and require a two-part process: (1) for the 2025–2110 MHz band, a site-specific coordination of the operator's stations and launch parameters with BAS operations; and (2) for both bands, coordination on a per-launch basis with NTIA. In practice, as described in more detail below, coordination processes for the two bands will be different given the existing 2025–2110 MHz coordination process currently conducted by SBE to protect BAS, CARS, and LTTS operations and previously coordinated Federal incumbents in the band.

*2025–2110 MHz Post-license Coordination (Earth-to-Space).* Once a launch operator registers its site and corresponding station information with the Commission in ULS and it is made available to the space launch frequency coordinator, the coordinator will verify that the operator is licensed and then contact the SBE Frequency Coordination Manager and the relevant SBE local market coordinator for the 2025–2110 MHz band to initiate coordination for the local launch site to protect non-Federal incumbents.

For this process, the Commission adopts an approach that mirrors the coordination approach that Federal users in the band must follow. As noted in the *FNPRM*, Federal entities seeking to use the 2025–2110 MHz band for TT&C uplink purposes must coordinate with all BAS and other non-Federal incumbents that may be affected by the Federal operation prior to submitting an application, and must engage the local BAS frequency coordinator(s) in support of achieving such coordination. In the context of pre-license grant coordination, the Commission sought comment on whether to require commercial space launch operators seeking to use the band to follow the same coordination process to help ensure that launch operations will not cause harmful interference to applicable non-Federal and Federal incumbents in the band. In its comments, SBE described this Federal precedent and pointed out that the terms of a subsequent SBE–NAB–DoD Memorandum of Understanding (MOU) are currently being used to coordinate Federal entities seeking to use the 2025–2110 MHz band for TT&C uplink purposes. Engineers for the Integrity of Broadcast Auxiliary Services Spectrum (EIBASS), NAB, and SpaceX supported the use of the BAS coordination approach set forth in the SBE–NAB–DoD MOU.

Accordingly, the Commission adopts the same site-specific BAS coordination process (and any re-coordination of the launch site) for commercial space

launch services for the Commission's post-license grant coordination regime. The Commission finds merit in SBE's suggestion that this means that each space launch communications operator, through a third-party space launch frequency coordinator, should either complete BAS coordination for its identified sites or provide a showing to the space launch frequency coordinator (a) that it has previously coordinated its proposed operations with the SBE Frequency Coordination Manager; (b) that it has ascertained that its proposal will not constrain, preclude, nor interfere with incumbents in the band, including BAS, CARS, and LTTS licensees; and (c) that it has demonstrated in a technical showing that its proposed operation will not create more than 0.5 dB increase in the noise threshold of a receiver at a fixed or temporary fixed electronic news gathering (ENG) receive site.

The Commission does not anticipate that there is a need for a subsequent per-launch coordination with BAS as long as the site operation for the proposed launch is consistent with the technical characteristics and launch parameters that were successfully coordinated previously and complies with any conditions or agreements resulting from such prior coordination. In other words, there is no need to conduct a per-launch coordination with BAS if the operator/frequency coordinator can perform the technical calculations to show its proposed uplink operations will meet the SBE-NAB-DoD protection criteria. The Commission finds that this approach will streamline the coordination process with BAS, particularly for space launch operators who provide multiple launches over their license term with the same sites that were previously coordinated and retain the same technical and operational characteristics. The Commission notes, however, that if these conditions are not met then the site must be re-coordinated pursuant to the site-specific BAS coordination process outlined above.

With respect to protecting Federal users in the band, the Commission will require coordination with NTIA on a post-grant, per-launch basis. This process will be initiated after the operator obtains its license and provides applicable launch site and corresponding station information to the Commission in ULS, and submits this data, along with its proposed operational parameters, in a coordination request to the third-party space launch frequency coordinator. Given the variability of space launches, per-launch coordination offers an

effective means of protecting co-frequency Federal users in the 2025–2110 MHz band from any potentially harmful interference stemming from a particular launch. The Commission notes that per-launch coordination is particularly well suited for accommodating the changing nature of Federal spectrum use. As demonstrated by NTIA's Federal Government Spectrum Use Reports, Federal spectrum uses and needs continue to evolve over time. The timely nature of a per-launch coordination with NTIA, facilitated by a third-party frequency coordinator, would account for the fluctuating needs of Federal TT&C used to track mobile satellites and the shifting demands of Federal mobile users that tend to change locations over time. The Commission contemplates a process that will be functionally similar to the current per-launch STA coordination procedures. As noted in the record, frequency coordination has been an effective tool in ensuring equitable spectrum sharing by co-frequency non-Federal and Federal users without causing harmful interference. While the Commission adopts baseline power and emissions standards to facilitate spectrum sharing and interoperability among Federal and non-Federal operations, as explained in further detail below, per-launch coordination will be critical in determining additional technical and operational parameters necessary to permit space launch operators to carry out missions without causing harmful interference to other users of the spectrum. Given the intermittent nature of space launch operations as well as evolving Federal spectrum uses, this targeted per-launch approach ensures timely and accurate guidance closer to the launch date by affording parties the flexibility to make adjustments necessary to protect co-frequency Federal users.

*2200–2290 MHz Post-license Coordination (Space-to-Earth).* Similarly, for the 2200–2290 MHz band, a space launch operator must identify applicable site and corresponding station information with the Commission in ULS and make it, along with its proposed operational details, available to the third-party space launch frequency coordinator, who verifies that the operator is licensed and that the request comports with rules, to initiate the coordination process with NTIA. Coordination with NTIA will be functionally similar to the current STA coordination process (*i.e.*, site-specific and per-launch coordination with NTIA and the relevant Federal offices).

Similar to the 2025–2110 MHz band, the coordination process will enable any necessary adjustments regarding the operational and technical parameters on a per-launch basis to protect against harmful interference.

The Commission directs WTB to seek further comment on the circumstances attending the designation of a third-party space launch coordinator, including a mechanism for selecting a frequency coordinator. As noted, WTB will issue a public notice regarding the coordination process after reviewing the record, which will include information regarding the third-party frequency coordinator.

### **Technical Rules for Space Launch Operations**

As noted in the *FNPRM*, the Commission seeks to establish technical parameters for commercial space launch operations that will support the evolving interests and requirements of commercial space entities while minimizing harmful interference between Federal and non-Federal operations. The Commission proposed that the current framework applicable to Federal operators would offer a predictable and tested model that facilitates the efficient use of spectrum while minimizing interference among users in these bands, and proposed to adopt a similar set of technical rules for non-Federal space launch operations in the 2200–2290 MHz and 2025–2110 MHz bands. The Commission finds that adopting baseline emissions and power limits similar to that which currently apply to Federal operations will facilitate interoperability and greater predictability regarding operations in these bands. As discussed previously, however, the variability of space launches and the changing needs of Federal operations may require additional or alternative technical requirements for a given launch as determined pursuant to the coordination process. The Commission concludes that adopting a technical framework that relies on close coordination between Federal and non-Federal entities as well as the use of similar emissions and power limits will help users of the bands to avoid harmful interference while allowing commercial launch providers to benefit from the economies of scale inherent from using the same communications systems for both Federal agencies and commercial customers.

### **2200–2290 MHz Band**

The *FNPRM* noted that space launch operations may potentially operate under a dual regulatory approach, and

sought comment on the appropriate technical requirements under both a space operations and aeronautical mobile allocation. The Commission asked whether these technical rules align with NTIA's requirements for both Federal and non-Federal space operations and how the Commission might promote consistency between and among the various, similarly situated services authorized in the band.

**Emission masks.** In the *FNPRM*, the Commission sought comment on whether to apply NTIA rules that require that earth and space stations in the space operations service above 470 MHz comply with the emissions mask standard established in section 5.6.2 of the NTIA Manual. Section 5.6.2 provides that for frequencies offset from the assigned frequency less than the 50 percent of the necessary bandwidth, no attenuation is required. At a frequency offset equal to 50 percent of the necessary bandwidth, an attenuation of at least 8 dB is required, while frequencies offset more than 50 percent of the necessary bandwidth should be attenuated in accordance with a specified formula dependent on necessary bandwidth and frequency displaced from the center of the emission bandwidth.

Further, the Commission noted that section 5.3.9 of the NTIA Manual provides that aeronautical telemetry operations in the 2200–2290 MHz band must meet the emissions limits from Chapter 2 of the Inter-Range Instrumentation Group (IRIG) Standard 106–15, part 1. Chapter 2 of IRIG Standard 106–15, part 1 (hereinafter IRIG Standard 106–15), in turn, includes the following aeronautical telemetry spectral mask: all spectral components larger than  $-[55 + 10 \log(P)]$  dBc (*i.e.*, larger than  $-25$  dBm) at the transmitter output must be within the spectral mask calculated using the following equation:

$$M(f) = K + 90 \log(R) - 100 \log |f - f_c|; |f - f_c| \geq R/m$$

Where

$M(f)$  = power (dBc) at frequency  $f$  (MHz)

$K = -20$  for analog signals

$K = -28$  for binary signals

$K = -61$  for FQPSK-B, FQPSK-JR, SQPSK-TG

$K = -73$  for ARTM CPM

$f_c$  = transmitter center frequency (MHz)

$R$  = bit rate (Mbps) for digital signals or  $(\Delta f + f_{\max})$ (MHz) for analog FM signals

$M$  = number of states in modulating signal ( $m = 2$  for binary signals,  $m = 4$  for quaternary signals and analog signals)

$\Delta f$  = peak deviation

$f_{\max}$  = maximum modulation frequency

The Commission also requested comment on the utility of using a single mask for non-Federal operations in the

band rather than NTIA's dual emissions mask approach. The Commission asked, for example, whether to apply the section 5.6.2 space operations emissions mask to all stages of flight, or whether alternatively to apply emissions limits set forth in the Commission's rules for space stations found in part 25 or an alternative mask found in § 87.139.

There was limited comment regarding the emissions limit(s) that should be applied. Of the few commenting on this issue, SpaceX supports the use of a single mask over NTIA's dual emissions mask approach, while ULA supports following NTIA's dual mask approach.

The Commission agrees with ULA that it should adopt NTIA's dual mask approach, and the Commission's adoption of a Mobile allocation for this band facilitates this approach. As noted, NTIA regards launch vehicles as undergoing two stages: an aeronautical mobile stage and a space operation stage. The NTIA rules treat the telemetry system during the first stage of a launch vehicle as an aeronautical mobile system. The NTIA rules provide that after the first stage (which it views as the first 15 minutes of flight), the launch vehicle operates as a space operation service during the second stage or higher stages of a launch. As the Commission has noted, it seeks to align the technical parameters used by Federal and non-Federal operations to facilitate interoperability with respect to use of the 2200–2290 MHz band, and to provide predictability regarding such operations for other users of the band. While the Commission appreciates SpaceX's desire to avoid "artificial delineations," the application of the dual approach best accommodates operations in this band as it is the approach that is already being utilized and which has proven to be effective in protecting operations in the band. Accordingly, the Commission will apply the dual aeronautical mobile and space operation emissions masks similar to those found in the NTIA rules.

**Power limits.** As noted in the *FNPRM*, the IRIG Standard 106–15 that NTIA applies to aeronautical telemetry in the 2200–2290 MHz band provides that the effective isotropic radiated power of a transmitter shall not exceed 25 watts and that the output power shall not exceed 25 watts. In contrast, NTIA's requirements for space operations do not impose a power limit, and instead rely on a power flux-density limit established by the ITU. The *FNPRM* sought comment on whether, consistent with the NTIA rules, to limit first-stage operations to an effective isotropic radiated power of 25 watts and a transmitter output power of up to 25

watts, and sought comment on whether to apply a power flux-density limit on operations after the first stage. Alternatively, to the extent the Commission adopts a power flux-density limit in the band, the *FNPRM* asked whether no further limit on power is necessary, or whether the Commission should adopt an alternative to the power limit in IRIG Standard 106–15.

As in the case of emissions masks, the Commission received limited comment on this issue. ULA argues that these limits are appropriate for aeronautical applications, but not for orbital launches. SpaceX supports the adoption of a single power flux-density limit for all aspects of launch operations rather than the use of power limits.

Upon review, the Commission finds that it is in the public interest to apply the dual stage aeronautical mobile and space operations approach for power limits as specified in the NTIA rules. While the Commission recognizes that there may be individual launch operations that requires the use of technical parameters outside of the norm, there is insufficient information in the record that would support deviation from limits currently used by NTIA during the first/ascent stage—either with respect to a power increase or to the use of a power flux-density limit. Neither would serve the Commission's goal of facilitating interoperability with Federal launch operations. With respect to ULA's request to adopt much higher power limits to support orbital launches, the Commission concludes that any orbital flight phase would be better governed by established space operation requirements, *i.e.* the NTIA/ITU space operation power flux-density limit. Further, the Commission does not find the use of the space operation power flux-density limit for all phases of a launch to be appropriate given that, as ULA notes, launch vehicles remain too close to the Earth's surface during the launch phase to comply with the limit. Moreover, neither commenter discusses the impact of their proposals on other users of the 2200–2290 MHz band. Absent support that these proposals would not adversely affect other operations in the band and provide advantages to commercial space launch entities that would exceed those that result from being able to operate with both Federal and non-Federal launch systems, the Commission finds it appropriate to follow the NTIA dual stage approach.

The *FNPRM* sought comment regarding the point at which the Commission should apply the ITU

power-flux density limits in the event the Commission adopts the dual aeronautical mobile and space operation service approach. The Commission finds it appropriate to apply the NTIA aeronautical mobile power limits to first stage launch operations (first 15 minutes of flight) and ITU-derived space operation power flux-density limits to launch operations beyond the first stage. The Commission will adopt the NTIA approach which regards the first stage of a launch as an aeronautical mobile operation and treats the second stage or higher stages of a launch as space operations. While Rocket Lab and NASA note the difficulties associated with defining the dividing line between aeronautical mobile operations and space operations according to launch stages, the Commission finds that doing so provides a predictable approach and permits the similar treatment of Federal and non-Federal space launch operations. To the extent that this approach presents technical issues for a given launch (for example, the approach would require the application of the power flux-density limit too early in a launch), operators may seek a waiver of this provision.

#### 2025–2110 MHz Band

*Emissions Limits.* As discussed in the *FNPRM*, the most analogous authorized Federal operation in the 2025–2110 MHz band is earth station telecommand transmissions to spacecraft, which operate under space operations rules. As discussed above, NTIA requires that earth and space stations in the space operations service above 470 MHz comply with the emissions mask standards established in section 5.6.2 of the NTIA Manual. Section 5.6.2 provides that for frequencies offset from the assigned frequency less than the 50 percent of the necessary bandwidth, no attenuation is required. At a frequency offset equal to 50 percent of the necessary bandwidth, an attenuation of at least 8 dB is required, while frequencies offset more than 50 percent of the necessary bandwidth should be attenuated in accordance with a specified formula dependent on necessary bandwidth and frequency displaced from the center of the emission bandwidth. The *FNPRM* proposed to adopt the NTIA's emissions mask for commercial space launch transmissions in the 2025–2110 MHz band, except that the Commission proposed to apply attenuation requirements to the licensee's assigned frequencies rather than requiring a separate calculation of necessary bandwidth.

SpaceX agrees that the Commission should apply the emissions mask applicable to space operation service for operations in the 2025–2110 MHz band. Other than SpaceX, the Commission received no other comment regarding the appropriate emissions limit for this band. Accordingly, in line with the Commission's overall approach for space launch technical rules, the Commission will apply an emissions mask using the same limit as that set forth in section 5.6.2 of the NTIA Manual.

Further, the Commission will retain the provision in section 5.6.2 which specifies attenuation requirements based on a separate calculation of necessary bandwidth. Although SpaceX supports the *FNPRM's* proposal to apply attenuation requirements based on a licensee's assigned frequencies, the Commission finds that it is more appropriate to apply the same methodology that is used currently. Given that the Commission seeks to apply a technical framework that provides predictability and minimizes the risk of interference among users in the band, the Commission finds that applying the section 5.6.2 methodology will provide consistency and prevent confusion. Accordingly, the Commission will not adopt its proposal to permit space launch operators to determine applicable attenuation requirements using the licensee's assigned frequencies.

*Power limits.* Section 8.2.35 of the NTIA manual requires that the EIRP transmitted in any direction towards the horizon by a Federal earth station in bands between 1 GHz and 15 GHz that are shared with stations in the fixed or mobile service, which includes the 2025–2110 MHz band, shall not (with limited exceptions) exceed the following limits:

+40 dBW in any 4 kHz band for  $\theta \leq 0^\circ$   
 +40+3 $\theta$  dBW in any 4 kHz band for  $0^\circ < \theta \leq 5^\circ$

Where:

$\theta$  is the angle of elevation of the horizon viewed from the center of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it.

As in the case with the 2200–2290 MHz band, SpaceX supports adoption of a single power flux-density limit for all aspects of launch operations in lieu of a specific power limit on the grounds that it would obviate the need for any additional limitations on power or for adopting artificial distinctions between various launch activities.

As the Commission noted with respect to SpaceX's proposal to apply a power flux-density limit to 2200–2290 MHz band operations, SpaceX does not provide sufficient information regarding the impact to other users of the 2025–2110 MHz band and provides no support as to whether using the space operation power flux-density limit will adequately protect other operations. Instead, SpaceX mainly argues that adopting a single flux-density limit for all aspects of a launch operation will simplify compliance for launch operators. While the Commission seeks to adopt rules that will help space launch entities to simplify or streamline operations, it is necessary that any measures that the Commission takes will also ensure that other users of the band are protected. Further, although SpaceX argues that ITU and NTIA regulations permit the use of the power flux-density limit for the 2025–2110 MHz band, the power limits above are the requirements that both ITU and NTIA specify for earth stations in bands that are shared with stations in the fixed or mobile service. Accordingly, the Commission adopts the same power limits as those set forth in section 8.2.35 of the NTIA Manual.

*Compliance with technical specifications.* In its Reply Comments, Northrop Grumman notes that because launch providers operate from Federal launch sites, launch vehicles and associated ground stations meet applicable Federal technical requirements, including emission limits, power limits, and power flux-density limits. Northrop Grumman recommends that, to ensure consistency and to avoid differing standards among launch sites, the Commission permit operators to demonstrate compliance with either (1) any new FCC requirements adopted in this proceeding or (2) existing Federal requirements serving the same purpose. Northrop Grumman argues that the latter is necessary to ensure that any new rules that the Commission apply to launch vehicle operators do not require that existing launch equipment be redesigned or modified or be subject to further regulatory requirements. Alternatively, Northrop Grumman argues that if the Commission imposes new technical standards, it should grandfather existing operators and exempt their current launch vehicles from these requirements. Northrop Grumman asserts that this flexibility is necessary to ensure that the application of any new technical standards does not delay or impact upcoming launches or require that existing launch vehicles be



modified or subject to further regulatory requirements.

While the Commission seeks to adopt rules that will facilitate the continued growth of the commercial space launch sector, and avoid policies that will negatively impact launch operations, the Commission is hesitant to grandfather operations that may not meet current required technical specifications. For example, Northrop Grumman notes that transmitters on its launch vehicles are designed to meet IRIG Standard 106–07, a previous IRIG Standard 106 version. While that standard shares many of the specifications as IRIG Standard 106–15, it is not clear that the use of IRIG Standard 106–07 or other standards meet all necessary technical specifications set forth here or in current NTIA requirements, and accordingly, the Commission is not prepared at this juncture to grandfather all existing launch vehicles.

#### Equipment Authorization

In the *FNPRM*, the Commission asked whether it should require part 2 equipment authorization for the radio frequency (RF) devices that are being used to provide space launch operations and if so, which procedure. The Commission also asked if there any analogous authorization models found in other any rule parts (specifically noting parts 25, 87, and 90) that could provide additional or alternative compliance requirements that may be appropriate for space launch RF devices.

Few comments addressed the issue of equipment authorization. ULA and Boeing both oppose specific equipment authorization rules, citing, in part, the current part 25 rules that do not include such requirements. Northrop Grumman “takes no position” on such requirements, however it does ask for a 5 year grandfathered period should the Commission decide to adopt rules in this regard.

The Commission shall not require that equipment used for space launch telemetry and telecommand during space launches under the part 26 rules be authorized under 47 CFR part 2, subpart J. The Commission expects that this equipment will be deployed by a limited number of licensees who will be responsible for ensuring that their transmitters comply with Commission’s rules. Given the small number of licensees the Commission does not believe there is utility in implementing an authorization requirement. This decision is consistent with the Commission’s part 87 rules which exempt flight test transmitters used for

limited periods from needing equipment certification.

#### Expanded Federal Use of the Non-Federal Fixed Satellite Service (FSS) and Mobile Satellite Service (MSS) Bands

In the 2013 *NPRM* (78 FR 39200, July 1, 2013), the Commission specifically sought comment on two proposals for expanding Federal use of non-Federal FSS and MSS satellites. One proposal was to add co-primary Federal FSS or MSS allocations to several bands together with a footnote that limits primary Federal use of the bands to earth stations communicating with non-Federal space stations. The other proposal was to add a footnote to the Table of Allocations outlining circumstances under which Federal earth stations operating with non-Federal space stations would be entitled to interference protection. In the *FNPRM*, the Commission sought to refresh the record on its proposals for expanding Federal use of non-Federal FSS and MSS satellites, noting that in the eight years since the *NPRM* was adopted “the spectrum landscape in non-Federal FSS and MSS allocations has changed significantly.”

The Commission continues to believe that improvements to its policies and processes for communications between earth stations utilized by government agencies and commercial satellites are desirable and may ultimately serve the public interest. However, the Commission believes that this issue, while related to space launch operations generally, implicates different licensing processes and ultimately would require implementation distinct from the changes to launch frequency licensing the Commission is adopting here. Therefore, the Commission concludes that Federal access would be better addressed through a separate proceeding specifically focused on communications between commercial satellites and Federal users.

Accordingly, the Commission will continue to examine the record on expanded Federal earth station access to non-Federal FSS and MSS satellites through a separate proceeding, and the Commission welcomes continued comment and dialogue from both Federal and non-Federal stakeholders as it seeks to address this issue, incorporating by reference the record to date on this issue from this proceeding. The Commission directs the Office of Engineering and Technology (OET) to issue a public notice opening a new docket for comments on this issue and provides additional context for interested parties to provide additional

comments. After receiving additional comments on this issue, OET is directed to develop a recommendation so as to enable Commission consideration not later than one year from the release of this item.

#### Federal Space Stations in the 399.9–400.05 MHz MSS Band

As requested by NTIA the Commission will revise footnote US319 of the Allocation Table to permit Federal space stations (*i.e.*, satellites) to operate in the 399.9–400.05 MHz band. Currently, U.S. Table footnote US319 prevents Federal space stations from operating in the 399.9–400.05 MHz band even though there is a primary Federal Mobile Satellite Service allocation for this band. NTIA requests that the footnote be modified to delete the 399.9–400.05 MHz band thereby allowing Federal satellites to operate in this band. Footnote US319 currently provides that “US319: In the bands 137–138 MHz, 148–149.9 MHz, 149.9–150.05 MHz, 399.9–400.05 MHz, 400.15–401 MHz, 1610–1626.5 MHz, and 2483.5–2500 MHz, Federal stations in the mobile-satellite service shall be limited to earth stations operating with non-Federal space stations.”

NTIA made this request to allow the 399.9–400.05 MHz band to be used for a new satellite system that will assume some of the non-environmental traffic currently handled by the Argos satellite system. Argos is a satellite system that was established by the French Space Agency, NASA, and the National Oceanic and Atmospheric Administration (NOAA) is used for a large number of applications such as monitoring the oceans at thousands of fixed and drifting buoys, tracking the movements of wildlife, relaying information by humanitarian agencies from remote areas, monitoring water resources, and tracking the locations of ships. The latest version of the Argos satellite system, the Argos-4 was launched on October 7, 2022. According to NTIA, the newly established satellite system in the 399.9–400.05 MHz band would allow non-environmental applications to be removed from the Argos system which will result in lower interference, higher capacity, and improved reliability and service for both the environmental applications remaining on Argos and the non-environmental applications moved to the new system.

The Commission first made the 399.9–400.05 MHz band along with three other frequency bands available for MSS in 1993 to allow deployment of non-geosynchronous low Earth orbit (LEO) satellite systems, called “Little

LEO'' systems, to provide non-voice services such as data messaging and position determination. In 2019, the Commission's International Bureau initiated a processing round for non-voice non-geostationary systems in this band as well as the 400.15–401 MHz band. The Commission's Space Bureau has granted market access for the 399.9–400.05 MHz band to three of these applicants while other applications remain pending or have been withdrawn. In the past two years other companies have filed applications to operate in the 399.9–400.05 MHz band.

The Commission received four comments and two reply comments in response to the *FNPRM*. Myriota Pty Ltd. (Myriota) and Fleet Space Technologies Pty. Ltd. (Fleet) express concerns regarding the impact to Internet of Things (IoT) connectivity and the coordination requirements needed to ensure there will be no interference between non-Federal and Federal space stations in the 399.9–400.05 MHz band. According to Myriota, making this modification to US319 would permit an unidentified number of Federal satellites to operate in the band and leave commercial operators who have invested in the band without adequate safeguards to ensure their operations will not be constrained. Myriota suggests that if the Commission makes this modification to US319 it should adhere to the stated purpose of the modification by permitting only a single Argos satellite and that NTIA and NOAA should consider whether commercial satellite operators could meet their mission requirements rather than operating Federal satellites in the band. Fleet points out that the 399.9–400.05 MHz band is the only globally harmonized UHF band for commercial smallsat MSS and claims that permitting Federal satellites in the band would disrupt the coordination among commercial satellite operators and delay deployment of innovative MSS applications. Blacksky Global supports amending footnote US319 and believes that allowing the band to assume some of the traffic currently handled by the Argos system would alleviate the pressure from Federal systems in adjacent bands and result in relaxation of the coordination conditions on non-Federal systems in the 401–402 MHz band. NTIA and DoC both emphasize the need to implement this modification of footnote US319 to ensure that the role of the United States in the Argos-4 program can proceed without any risk to its operation.

The Commission is revising US319 as NTIA requests to enable establishment of a new satellite system to supplement

the Argos program to further the reliable provision of important services. The Commission appreciates the concerns expressed by Myriota and Fleet that the use of this band by a Federal satellite system may complicate the interference environment and create coordination burdens. However, any Federal satellites that will operate in the band and the associated earth stations will be subject to coordination between NTIA and the Commission. During this coordination process any issues regarding coexistence between the Federal and non-Federal systems can be addressed. As applicants who filed during the processing round indicated that they are capable of sharing with current and future licensees in these bands, the Commission is confident that at the conclusion of this coordination process the Federal satellites will be able to share the band with the existing systems without harmful interference occurring. As the demand for spectrum continues to increase the Commission must continue to look for opportunities to more intensively use spectrum where possible. Therefore, the Commission sees no reason to reject NTIA's request to modify US319.

#### Ordering Clauses

Accordingly, *it is ordered* that pursuant to sections 1, 2, 4(i), 5(c), 301, 303(c), 303(f), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 151, 152, 154(i), 155(c), 301, 303(c), 303(f), and 303(r), and § 1.411 of the Commission's rules, 47 CFR 1.411, the Second Report and Order *is hereby adopted*.

*It is further ordered* that the amendments of parts 2 and 26 of the Commission's rules as set forth in Appendix A of the Second Report and Order, *are adopted*, effective thirty (30) days after publication in the **Federal Register**, with the exception of §§ 26.106, 26.108, 26.202, and 26.301, which contain new or modified information collection requirements that require review by the Office of Management and Budget (OMB) under the Paperwork Reduction Act. The Commission directs the Wireless Telecommunications Bureau to announce the effective date of those information collections in a document published in the **Federal Register** after the Commission receives OMB approval, and directs the Wireless Telecommunications Bureau to cause these rule sections to be revised accordingly.

*It is further ordered* that the Office of the Secretary, Reference Information Center, *shall send* a copy of the Second Report and Order, including the Final

Regulatory Flexibility Analysis and the Initial Regulatory Flexibility Analysis, to the Chief Counsel for Advocacy of the Small Business Administration.

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

#### List of Subjects

##### 47 CFR Part 0

Authority delegations (Government agencies), Reporting and recordkeeping requirements, Telecommunications.

##### 47 CFR Part 1

Administrative practice and procedure.

##### 47 CFR Part 2

Radio, Space transportation and exploration, Telecommunications.

##### 47 CFR Part 26

Incorporation by reference, Radio, Space transportation and exploration, Telecommunications.

Federal Communications Commission.

**Marlene Dortch,**

*Secretary.*

#### Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR chapter I as follows:

#### PART 0—COMMISSION ORGANIZATION

■ 1. The authority citation for part 0 continues to read as follows:

**Authority:** 47 U.S.C. 151, 154(i), 154(j), 155, 225, 409, and 1754, unless otherwise noted.

■ 2. Amend § 0.331 by adding paragraph (h) to read as follows:

##### § 0.331 Authority delegated.

\* \* \* \* \*

(h) *Authority concerning space launch services programs and licensing.* The Chief of the Wireless Telecommunications Bureau is delegated authority to administer the Commission's space launch services programs (part 26 of this chapter) and the issuing of space launch services licenses. The Chief is delegated authority to develop specific methods that will be used to develop an application filing procedure for initial authorization and subsequent station registration; to seek comment on the circumstances attending the designation

of a third-party space launch frequency coordinator, including a mechanism for selecting a frequency coordinator; to develop procedures that the space launch frequency coordinator will use to ensure compliance with the coordination requirements for space launch operations; and to perform other functions as needed for the administration of the space launch services.

**PART 1—PRACTICE AND PROCEDURE**

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

**Authority:** 47 U.S.C. chs. 2, 5, 9, 13; 28 U.S.C. 2461 note; 47 U.S.C. 1754, unless otherwise noted.

■ 4. Revise § 1.901 to read as follows:

**§ 1.901 Basis and purpose.**

This subpart is issued pursuant to the Communications Act of 1934, as amended, 47 U.S.C. 151 *et seq.* The purpose of this subpart is to establish the requirements and conditions under which entities may be licensed in the Wireless Radio Services as described in this part and in parts 13, 20, 22, 24, 26, 27, 74, 80, 87, 90, 95, 96, 97, and 101 of this chapter.

■ 5. Revise § 1.902 to read as follows:

**§ 1.902 Scope.**

In case of any conflict between the rules set forth in this subpart and the rules set forth in parts 13, 20, 22, 24, 26, 27, 74, 80, 87, 90, 95, 96, 97, and 101 of this chapter, the rules in this subpart shall govern.

■ 6. Amend § 1.907 by revising the definitions of “Covered geographic licenses” and “Wireless Radio Services” to read as follows:

**§ 1.907 Definitions.**

\* \* \* \* \*

*Covered geographic licenses.* Covered geographic licenses consist of the following services: 1.4 GHz Service (part 27, subpart I, of this chapter); 1.6 GHz Service (part 27, subpart J); 24 GHz Service and Digital Electronic Message Services (part 101, subpart G, of this chapter); 218–219 MHz Service (part 95, subpart F, of this chapter); 220–222 MHz Service, excluding public safety licenses (part 90, subpart T, of this chapter); 600 MHz Service (part 27, subpart N); 700 MHz Commercial Services (part 27, subparts F and H); 700 MHz Guard Band Service (part 27, subpart G); 800 MHz Specialized Mobile Radio Service (part 90, subpart S); 900 MHz Specialized Mobile Radio Service (part 90, subpart S); 900 MHz Broadband Service (part 27, subpart P); 3.45 GHz Service (part 27, subpart Q); 3.7 GHz Service (part 27, subpart O); Advanced Wireless Services (part 27, subparts K and L); Air-Ground Radiotelephone Service (Commercial Aviation) (part 22, subpart G, of this chapter); Broadband Personal Communications Service (part 24, subpart E, of this chapter); Broadband Radio Service (part 27, subpart M); Cellular Radiotelephone Service (part 22, subpart H); Citizens Broadband Radio Service (part 96, subpart C, of this chapter); Dedicated Short Range Communications Service, excluding public safety licenses (part 90, subpart M); Educational Broadband Service (part 27, subpart M); H Block Service (part 27, subpart K); Local Multipoint Distribution Service (part 101, subpart L); Multichannel Video Distribution and Data Service (part 101, subpart P); Multilateration Location and Monitoring

Service (part 90, subpart M); Multiple Address Systems (EAs) (part 101, subpart O); Narrowband Personal Communications Service (part 24, subpart D); Paging and Radiotelephone Service (part 22, subpart E; part 90, subpart P); VHF Public Coast Stations, including Automated Maritime Telecommunications Systems (part 80, subpart J, of this chapter); Space Launch Services (part 26 of this chapter); Upper Microwave Flexible Use Service (part 30 of this chapter); and Wireless Communications Service (part 27, subpart D).

\* \* \* \* \*

*Wireless Radio Services.* All radio services authorized in parts 13, 20, 22, 24, 26, 27, 74, 80, 87, 90, 95, 96, 97 and 101 of this chapter, whether commercial or private in nature.

\* \* \* \* \*

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

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

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

■ 8. Amend § 2.106 by:

- a. In paragraph (a), revising pages 26, 36, and 37;
- b. Adding paragraph (c)(94); and
- c. Revising paragraphs (c)(96) and (319).

The revisions and addition read as follows:

**§ 2.106 Table of Frequency Allocations.**

(a) \* \* \*

BILLING CODE 6712-01-P

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	322-328.6 FIXED MOBILE	322-328.6	
5.149	US342 G27	US342	
328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258	328.6-335.4 AERONAUTICAL RADIONAVIGATION 5.258		Aviation (87)
5.259			
335.4-387 FIXED MOBILE	335.4-399.9 FIXED MOBILE	335.4-399.9	
5.254			
387-390 FIXED MOBILE Mobile-satellite (space-to-Earth) 5.208A 5.208B 5.254 5.255			

<p>390-399.9 FIXED MOBILE</p>			
<p>5.254 399.9-400.05 MOBILE-SATELLITE (Earth-to-space) 5.209 5.220</p>	<p>G27 G100</p>	<p>399.9-400.05 MOBILE-SATELLITE (Earth-to-space) US320 RADIONAVIGATION-SATELLITE</p>	<p>Satellite Communications (25)</p>
<p>400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261 5.262</p>	<p>400.05-400.15 STANDARD FREQUENCY AND TIME SIGNAL-SATELLITE (400.1 MHz) 5.261</p>		

1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile  5.289 5.341	1700-1710 FIXED METEOROLOGICAL-SATELLITE (space-to-Earth) MOBILE except aeronautical mobile  5.289 5.341 5.384			
1710-1930 FIXED MOBILE 5.384A 5.388A 5.388B		1710-1761  5.341 US91 US378 US385	1710-1780 FIXED MOBILE  5.341 US91 US378 US385	
		1761-1780 SPACE OPERATION (Earth-to-space) G42 US91		
		1780-1850 FIXED MOBILE SPACE OPERATION (Earth-to-space) G42	1780-1850	
5.149 5.341 5.385 5.386 5.387 5.388		1850-2025	1850-2000 FIXED MOBILE	RF Devices (15) Personal Communications (24) Wireless Communications (27) Fixed Microwave (101)
1930-1970 FIXED MOBILE 5.388A 5.388B  5.388	1930-1970 FIXED MOBILE 5.388A 5.388B Mobile-satellite (Earth-to-space) 5.388	1930-1970 FIXED MOBILE 5.388A 5.388B  5.388		
1970-1980 FIXED MOBILE 5.388A 5.388B  5.388				
1980-2010 FIXED MOBILE				

MOBILE-SATELLITE (Earth-to-space) 5.351A 5.388 5.389A 5.389B 5.389F				
2010-2025 FIXED MOBILE 5.388A 5.388B	2010-2025 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	2010-2025 FIXED MOBILE 5.388A 5.388B	2000-2020 FIXED MOBILE MOBILE-SATELLITE (Earth-to-space)	Satellite Communications (25) Wireless Communications (27)
5.388	5.388 5.389C 5.389E	5.388	2020-2025 FIXED MOBILE	
2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) FIXED MOBILE 5.391 SPACE RESEARCH (Earth-to-space) (space-to-space)		2025-2110 SPACE OPERATION (Earth-to-space) (space-to-space) EARTH EXPLORATION-SATELLITE (Earth-to-space) (space-to-space) SPACE RESEARCH (Earth-to-space) (space-to-space) FIXED MOBILE 5.391  5.392 US90 US92 US222 US346 US347	2025-2110 FIXED NG118 MOBILE 5.391 Space Operation (Earth-to-space) US94  5.392 US90 US92 US222 US346 US347	Space Launch Services (26) TV Auxiliary Broadcasting (74F) Cable TV Relay (78) Local TV Transmission (101J)
5.392				

Table of Frequency Allocations  
(UHF)

2110-2483.5 MHz

International Table			United States Table		FCC Rule Part(s)
Region 1 Table	Region 2 Table	Region 3 Table	Federal Table	Non-Federal Table	
2110-2120 FIXED MOBILE 5.388A 5.388B SPACE RESEARCH (deep space) (Earth-to-space) 5.388			2110-2120	2110-2120 FIXED MOBILE	Public Mobile (22) Wireless Communication (27)
2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2160 FIXED MOBILE 5.388A 5.388B Mobile-satellite (space-to-Earth) 5.388	2120-2170 FIXED MOBILE 5.388A 5.388B	2120-2200	2120-2180 FIXED MOBILE	Fixed Microwave (101)
5.388	2160-2170 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.388 5.389C 5.389E	5.388		NG41	
2170-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth) 5.351A 5.388 5.389A 5.389F				2180-2200 FIXED MOBILE MOBILE-SATELLITE (space-to-Earth)	Satellite Communications (25) Wireless Communications (27)



<p>2200-2290                  SPACE OPERATION (space-to-Earth) (space-to-space)                  EARTH EXPLORATION-SATELLITE (space-to-Earth) (space-to-space)                  FIXED                  MOBILE 5.391                  SPACE RESEARCH (space-to-Earth) (space-to-space)</p> <p>5.392</p>	<p>2200-2290                  SPACE OPERATION                  (space-to-Earth)                  (space-to-space) US96                  EARTH EXPLORATION-SATELLITE                  (space-to-Earth) (space-to-space)                  FIXED (line-of-sight only)                  MOBILE (line-of-sight only including                  aeronautical telemetry, but excluding                  flight testing of manned aircraft) 5.391                  SPACE RESEARCH (space-to-Earth)                  (space-to-space)                  5.392 US303</p>	<p>2200-2290</p> <p>US96 US303</p>	<p>Space Launch Services (26)</p>
<p>2290-2300                  FIXED                  MOBILE except aeronautical mobile                  SPACE RESEARCH (deep space) (space-to-Earth)</p>	<p>2290-2300                  FIXED                  MOBILE except aeronautical mobile                  SPACE RESEARCH (deep space)                  (space-to-Earth)</p>	<p>2290-2300                  SPACE RESEARCH (deep space)                  (space-to-Earth)</p>	
<p>2300-2450                  FIXED                  MOBILE 5.384A                  Amateur                  Radiolocation</p>	<p>2300-2450                  FIXED                  MOBILE 5.384A                  RADIOLOCATION                  Amateur</p>	<p>2300-2305                  Amateur</p>	<p>Amateur Radio (97)</p>
		<p>2305-2310                  FIXED                  MOBILE except aeronautical mobile                  RADIOLOCATION                  Amateur                  US97</p>	<p>Wireless                  Communications (27)                  Amateur Radio (97)</p>

\* \* \* \* \*

(c) \* \* \*

(94) US94 In the band 2025–2110 MHz, the non-Federal space operation service shall be subject to the following conditions:

(i) Transmissions are restricted to telecommand use for pre-launch testing and space launch operations.

(ii) Subject to coordination with the National Telecommunications and Information Administration (NTIA) prior to each launch.

(iii) Subject to coordination with non-Federal fixed and mobile stations.

\* \* \* \* \*

(96) US96 The band 2200–2290 MHz is allocated to the space operation service (space-to-Earth) and mobile service on a secondary basis for non-Federal use subject to the following conditions. Non-Federal stations shall be:

(i) Restricted to use for pre-launch testing and space launch operations, except as provided under US303; and

(ii) Subject to coordination with NTIA prior to each launch.

\* \* \* \* \*

(319) US319 In the bands 137–138 MHz, 148–149.9 MHz, 149.9–150.05 MHz, 400.15–401 MHz, 1610–1626.5 MHz, and 2483.5–2500 MHz, Federal stations in the mobile-satellite service shall be limited to earth stations operating with non-Federal space stations.

\* \* \* \* \*

■ 9. Add part 26 to read as follows:

## PART 26—SPACE LAUNCH SERVICES

### Subpart A—General Information

Sec.

26.1 Basis and purpose.

26.2 Frequencies.

26.3 Scope of service.

26.4 Other applicable rule parts.

26.5 Terms and definitions.

### Subpart B—Applications and Licenses

26.101 Eligibility.

26.102 License period; renewal.

26.103 Licensing.

26.104 Regulatory status.

26.105 Authorization required.

26.106 [Reserved]

26.107 Restrictions on the operation of stations.

26.108 [Reserved]

26.109 Assignment and transfer.

### Subpart C—Frequency Coordination

26.201 Policies governing the assignment of frequencies.

26.202 [Reserved]

### Subpart D—Technical Standards

26.301 [Reserved]

26.302 Emission masks.

26.303 Power limits.

26.304 Antenna structures; air navigation safety.

26.305 Incorporation by reference.

**Authority:** 47 U.S.C. 151, 152, 154, 301, 303, unless otherwise noted.

## Subpart A—General Information

### § 26.1 Basis and purpose.

This section contains the statutory basis for the rules in this part and provides the purpose for which this part is issued.

(a) *Basis.* The rules for Space Launch Services in this part are promulgated under the provisions of the Communications Act of 1934, as amended, that vest authority in the Federal Communications Commission (Commission or FCC) to regulate radio transmission and to issue licenses for radio stations. All rules in this part are in accordance with applicable treaties and agreements to which the United States is a party.

(b) *Purpose.* This part states the conditions under which spectrum is made available and licensed for the provision of Space Launch Services. This part does not govern the licensing of radio systems belonging to and operated by the United States.

### § 26.2 Frequencies.

The following frequencies are available for assignment on a nationwide, non-exclusive basis for Space Launch Services:

(a) 2025–2110 MHz; and

(b) 2200–2290 MHz.

### § 26.3 Scope of service.

(a) Space launch stations are restricted to the following uses:

(1) *2025–2110 MHz band.* The use of Space Launch Services licenses in the 2025–2110 MHz band is restricted to ground-to-launch vehicle telecommand uses necessary to support space launch operations.

(2) *2200–2290 MHz band.* The use of Space Launch Services licenses in the 2200–2290 MHz band is restricted to launch vehicle-to-ground communications associated with telemetry and tracking operations.

(b) Telemetry, tracking, and telecommand functions permissible as space launch operations include, but are not limited to:

(1) Pre-launch testing, such as pre-flight checks, ground testing, and telemetry;

(2) Vehicle tracking, including the transmission of parameter data from a launch vehicle to ground;

(3) Telecommand signals for propulsive maneuvering of a launch vehicle and separation of payload from launch vehicle; and

(4) Telecommand signals for propulsive maneuvering of a reentry vehicle for return and recovery.

(c) The use of Space Launch Services licenses for on-orbit communications after a launch vehicle separates from its payload are not permitted, provided that a space launch station may be used for telemetry, tracking, and telecommand activities for the incidental orbiting of a launch vehicle before or after it has separated from its payload. The use of Space Launch Services licenses for such incidental orbiting are permitted only to the extent necessary for space launch operations.

### § 26.4 Other applicable rule parts.

Other FCC rule parts applicable to the Space Launch Services include the following:

(a) *Part 0.* Part 0 of this chapter describes the Commission's organization and delegations of authority. Part 0 also lists available Commission publications, standards, and procedures for access to Commission records, and location of Commission Field Offices.

(b) *Part 1.* Part 1 of this chapter includes rules of practice and procedure for license applications, adjudicatory proceedings, procedures for reconsideration and review of the Commission's actions; provisions concerning violation notices and forfeiture proceedings; competitive bidding procedures; and the environmental requirements that, together with the procedures specified in § 17.4(c) of this chapter, if applicable, must be complied with prior to the initiation of construction. Subpart F of part 1 includes the rules for the Wireless Radio Services and the procedures for filing electronically via the Universal Licensing System (ULS).

(c) *Part 2.* Part 2 of this chapter contains the Table of Frequency Allocations and special requirements in international regulations, recommendations, agreements, and treaties. Part 2 also contains standards and procedures concerning the marketing and importation of radio frequency devices, and for obtaining equipment authorization.

(d) *Part 5.* Part 5 of this chapter contains rules prescribing the manner in which parts of the radio frequency spectrum may be made available for experimentation.

(e) *Part 15.* Part 15 of this chapter sets forth the requirements and conditions applicable to certain radio frequency devices.

(f) *Part 17.* Part 17 of this chapter contains requirements for the construction, marking and lighting of

antenna towers, and the environmental notification process that must be completed before filing certain antenna structure registration applications.

(g) *Part 25.* Part 25 of this chapter contains the requirements for satellite digital audio radio service (DARS).

(h) *Part 74.* Part 74 of this chapter sets forth the requirements and conditions applicable to experimental radio, auxiliary, special broadcast, and other program distributional services.

(i) *Part 87.* Part 87 of this chapter sets forth the requirements and conditions applicable to aviation services.

#### § 26.5 Terms and definitions.

*Base station.* A station at a specified site authorized to communicate with mobile stations.

*Equivalent isotropically radiated power (EIRP).* The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna (absolute or isotropic gain).

*Expendable launch vehicle.* A launch vehicle whose propulsive stages are used only once.

*First stage of a launch.* The first 15 minutes of flight.

*Fixed service.* A radio communication service between specified fixed points.

*Fixed station.* A station in the fixed service.

*Frequency coordination.* The process of obtaining the recommendation of a frequency coordinator for a frequency(ies) that will most effectively meet the applicant's needs while minimizing interference to licensees already operating within a given frequency band.

*Frequency coordinator.* An entity or organization that has been certified by the Commission to recommend frequencies for use by licensees in the Space Launch Services.

*Harmful interference.* For the purposes of resolving conflicts between stations operating under this part, any emission, radiation, or induction which specifically degrades, obstructs, or interrupts the service provided by such stations.

*Itinerant operation.* Operation of a radio station at unspecified locations for varying periods of time.

*Launch vehicle.* A vehicle built to place a payload or human beings from Earth in a suborbital trajectory, in Earth orbit, or otherwise in outer space.

*Mobile service.* A radio communication service between mobile and land stations, or between mobile stations.

*Mobile station.* A station in the mobile service intended to be used while in

motion or during halts at unspecified points.

*Reentry vehicle.* A vehicle designed to return from Earth orbit or outer space to Earth substantially intact. A reentry vehicle is regarded as a launch vehicle in the context of a space launch operation only to the extent that it is being used for launch purposes.

*Reusable launch vehicle.* A launch vehicle that is designed to return to Earth substantially intact and may be launched more than one time or that contains vehicle stages that may be recovered by a launch operator for future use.

*Space launch operations.* Any activity that places a launch vehicle, whether an expendable launch vehicle or a reusable launch vehicle or reentry vehicle used for launch, and any payload or human being from Earth in a suborbital trajectory, in Earth orbit, or otherwise in outer space, including pre-launch testing and recovery or reentry of the launch vehicle.

*Telecommand.* The transmission of non-voice signals for the purpose of remotely controlling a device.

*Telemetry.* The transmission of non-voice signals for the purpose of automatically indicating or recording measurements at a distance from the measuring instrument. In the context of space launch operations, telemetry is diagnostic information, transmitted from the launch vehicle to ground controller stations during the flight, which allows the ground controller station to track the performance of the launch vehicle.

*Universal Licensing System (ULS).* The consolidated database, application filing system, and processing system for all Wireless Telecommunications Services. The ULS offers Wireless Telecommunications Bureau (WTB) applicants and the general public electronic filing of all applications requests, and full public access to all WTB licensing data.

### Subpart B—Applications and Licenses

#### § 26.101 Eligibility.

The following entities are eligible for Space Launch Services licenses:

(a) A non-Federal entity that conducts space launch operations; or

(b) A parent of such entity or a subsidiary of such entity if either conducts space launch operations.

#### § 26.102 License period; renewal.

Licenses for stations in the Space Launch Services will be issued for a term of ten years from the date of original issuance, or renewal. Prior to expiration of the term of a license, the

space launch licensee shall submit to the Commission an application for the renewal in accordance with part 1, subpart F, of this chapter. Such renewal application shall certify that, during the preceding license term, the licensee operated and continues to operate consistent with Commission rules in this chapter and the terms of its existing authorization, including the operation of stations consistent with the terms of frequency coordination performed during its license term.

#### § 26.103 Licensing.

The 2025–2110 MHz and 2200–2290 MHz bands are authorized on a non-exclusive nationwide basis for Space Launch Services. Non-exclusive nationwide licenses will serve as a prerequisite for registering launch sites and individual fixed, base, itinerant, and mobile stations, as well as individual coordinated launches. A Space Launch Services licensee cannot operate a launch site and corresponding fixed, base, itinerant, or mobile stations before registering it under its license and may only operate a station after that station has been cleared to operate in a particular frequency band in connection with a particular launch pursuant to the post-grant frequency coordination process set forth in subpart C of this part. Space Launch Services licensees must delete registrations for unused launch sites and unused fixed, base, itinerant, and mobile stations to maintain database integrity and facilitate coordination with other users of the 2025–2110 MHz and 2200–2290 MHz bands.

#### § 26.104 Regulatory status.

Licensees are permitted to provide services on a non-common carrier basis. A licensee may render communications services consistent with the regulatory status in its license and with the Commission's rules in this chapter applicable to the Space Launch Services.

#### § 26.105 Authorization required.

(a) *General rule.* Stations in the Space Launch Services must be used and operated only in accordance with the service rules set forth in this part, including the terms of the frequency coordination performed pursuant to subpart C of this part, and with a valid authorization granted by the Commission under the provisions of this part, except as specified in paragraph (b) of this section.

(b) *Restrictions.* The holding of an authorization does not create any rights beyond the terms, conditions, and period specified in the authorization.

Authorizations may be granted upon proper application, provided that the Commission finds that the applicant is qualified in regard to citizenship, character, financial, technical, and other criteria, and that the public interest, convenience, and necessity will be served. See 47 U.S.C. 301, 308, 309, and 310.

**§ 26.106 [Reserved]**

**§ 26.107 Restrictions on the operation of stations.**

Stations in the Space Launch Services may operate in a particular frequency band only if they have been registered pursuant to this subpart and cleared to operate in that frequency band by the space launch frequency coordinator using the frequency coordination process set forth in subpart C of this part.

**§ 26.108 [Reserved]**

**§ 26.109 Assignment and transfer.**

Licensees may assign or transfer their non-exclusive nationwide licenses upon application to and prior approval from the Commission, and any stations registered under those licenses will

remain associated with those licenses unless otherwise agreed upon by the parties to the assignment or transfer and approved by the Commission.

**Subpart C—Frequency Coordination**

**§ 26.201 Policies governing the assignment of frequencies.**

(a) Frequencies assigned to Space Launch Services stations are available on a shared basis only and will not be assigned for the exclusive use of any licensee.

(b) Any base, fixed, itinerant, or mobile station operating in the band must comply with the frequency coordination requirements set forth in this subpart.

(c) All applicants and licensees shall cooperate in the selection and use of frequencies for Space Launch Services and comply with the frequency coordination requirements in this subpart in order to minimize the potential for interference and make the most effective use of the authorized facilities. Information regarding registered launch sites, stations, and launches that have completed the frequency coordination process set forth in this subpart will be available at

<https://wireless.fcc.gov/uls>. Licensees should examine this information before registering individual launch operations, and make every effort to ensure that their planned launch operations will not interfere or conflict with previously registered operations. Licensees of stations suffering or causing harmful interference are expected to cooperate and resolve this problem by mutually satisfactory arrangements.

**§ 26.202 [Reserved]**

**Subpart D—Technical Standards.**

**§ 26.301 [Reserved]**

**§ 26.302 Emission masks.**

(a) *2025–2110 MHz.* For frequencies offset from the assigned frequency less than the 50 percent of the necessary bandwidth, no attenuation is required. At a frequency offset equal to 50 percent of the necessary bandwidth, an attenuation of at least 8 dB is required. Frequencies offset more than 50 percent of the necessary bandwidth shall be attenuated by the following mask:

Equation 1 to Paragraph (a)

$$40 \times \log \left( \frac{2 \times |f_d|}{B_n} \right) + 8 \text{ dBsd}$$

Where:

$f_d$  is the frequency displaced from the center of the emission bandwidth.

$B_n$  is the necessary bandwidth, which is determined in accordance with Annex J of the NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management (NTIA Manual) (incorporated by reference, see § 26.305).

dBsd is dB attenuation in a 4 kHz bandwidth, relative to the maximum power in any 4 kHz bandwidth within the necessary bandwidth (0 dBsd), where attenuation in this sense refers to the reduction in level relative to the reference, 0 dBsd, unless otherwise specified.

The unwanted emission mask rolls off at 40 dB per decade to a maximum attenuation of 60 dBsd, at which point it continues on both sides of the carrier for all frequencies beyond this point; see Annex M of the NTIA Manual regarding measurement requirements (incorporated by reference, see § 26.305); for any narrowband or single frequency unwanted emission which is not spread by the modulation process, the required attenuation shall be at least 60 dBc, where dBc is attenuation below the mean transmit power, rather than

the dBsd value determined in equation 1 to this paragraph (a).

(b) *2200–2290 MHz.* (1) During the first stage of a launch, all spectral components larger than  $-[55 + 10 \times \log(P)]$  dBc (*i.e.*, larger than  $-25$  dBm) at the transmitter output must be within the spectral mask calculated using the following equation:

Equation 2 to Paragraph (b)(1)

$$M(f) = K + 90 \log(R) - 100 \log |f - f_c|; |f - f_c| \geq R/m$$

Where:

$M(f)$  = power (dBc) at frequency  $f$  (MHz).

$K$  =  $-20$  for analog signals.

$K$  =  $-28$  for binary signals.

$K$  =  $-61$  for FQPSK-B, FQPSK-JR, SQPSK-TG.

$K$  =  $-73$  for ARTM CPM.

$f_c$  = transmitter center frequency (MHz).

$R$  = bit rate (Mbps) for digital signals or  $(\Delta f + f_{\text{max}})$  (MHz) for analog FM signals.

$M$  = number of states in modulating signal ( $m = 2$  for binary signals,  $m = 4$  for quaternary signals and analog signals).

$f$  = peak deviation.

$f_{\text{max}}$  = maximum modulation frequency.

(2) After the first stage of a launch, the emission mask set forth in paragraph (a) of this section shall apply.

**§ 26.303 Power limits.**

(a) *2025–2110 MHz.* The equivalent isotropically radiated power (EIRP) transmitted in any direction towards the horizon by an earth station in the 2025–2110 MHz band of the Space Launch Services shall not (with limited exceptions) exceed the following limits:

(1)  $+40$  dBW in any 4 kHz band for  $\theta \leq 0^\circ$ ;

(2)  $+40+3\theta$  dBW in any 4 kHz band for  $0^\circ < \theta \leq 5^\circ$ ; and

(3) Where  $\theta$  is the angle of elevation of the horizon viewed from the center of radiation of the antenna of the earth station and measured in degrees as positive above the horizontal plane and negative below it.

(b) *2200–2290 MHz.* During the first stage of a launch, the EIRP of any station in the 2200–2290 MHz band of the Space Launch Services shall not exceed 25 Watts and the transmitter output power shall not exceed 25 Watts. In addition, the power flux-density at the Earth's surface produced by emissions from a transmitter operating after the first stage of a launch for all conditions and for all methods of modulation shall not exceed the following limits:

(1) – 154 dB(W/m<sup>2</sup>) in any 4 kHz for angles of arrival less than 5° above the horizontal plane;

(2) – 154 + 0.5 (δ – 5) dB(W/m<sup>2</sup>) in any 4 kHz for angles of arrival δ (degrees) between 5° and 25° above the horizontal plane; and

(3) – 144 dB(W/m<sup>2</sup>) in any 4 kHz for angles of arrival between 25° and 90° above the horizontal plane.

**§ 26.304 Antenna structures; air navigation safety.**

A licensee that owns its antenna structure(s) must not allow such antenna structure(s) to become a hazard to air navigation. In general, antenna structure owners are responsible for registering antenna structures with the FCC if required by part 17 of this chapter, and for installing and maintaining any required marking and lighting. However, in the event of default of this responsibility by an antenna structure owner, the FCC permittee or licensee authorized to use an affected antenna structure will be held responsible by the FCC for ensuring that the antenna structure continues to meet the requirements of part 17. See § 17.6 of this chapter.

(a) *Marking and lighting.* Antenna structures must be marked, lighted and maintained in accordance with part 17 of this chapter and all applicable rules and requirements of the Federal Aviation Administration (see §§ 77.5 through 77.11 of this chapter). For any construction or alteration that would exceed the requirements of § 17.7 of this chapter, licensees must notify the appropriate Regional Office of the Federal Aviation Administration (FAA Form 7460–1) and file a request for antenna height clearance and obstruction marking and lighting specifications (FCC Form 854) with the FCC, WTB, 1270 Fairfield Road, Gettysburg, PA 17325.

(b) *Maintenance contracts.* Antenna structure owners (or licensees and permittees, in the event of default by an antenna structure owner) may enter into contracts with other entities to monitor and carry out necessary maintenance of antenna structures. Antenna structure owners (or licensees and permittees, in the event of default by an antenna structure owner) that make such contractual arrangements continue to be responsible for the maintenance of antenna structures in regard to air navigation safety.

**§ 26.305 Incorporation by reference.**

Certain material is incorporated by reference into this subpart with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1

CFR part 51. All approved incorporation by reference (IBR) material is available for inspection at the Federal Communications Commission (FCC) and at the National Archives and Records Administration (NARA). Contact the FCC at the address indicated in § 0.401(a) of this chapter; phone: (202) 418–0270; email: [oetinfo@fcc.gov](mailto:oetinfo@fcc.gov). For information on the availability of this material at NARA, visit [www.archives.gov/federal-register/cfr/ibr-locations](http://www.archives.gov/federal-register/cfr/ibr-locations) or email [fr.inspection@nara.gov](mailto:fr.inspection@nara.gov). The material may be obtained from National Telecommunications and Information Administration (NTIA), Office of Spectrum Management, 1401 Constitution Avenue NW, Room 1087, Washington, DC 20230; phone (202) 482–1850; website: [www.ntia.gov/office/office-spectrum-management-osm](http://www.ntia.gov/office/office-spectrum-management-osm):

(a) NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management, Annex J: Guidance for Determination of Necessary Bandwidth, NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management, January 2023 Revision (of the January 2021 Edition); IBR approved for § 26.302. (Available at [www.ntia.gov/sites/default/files/2023-11/j\\_2021\\_edition\\_rev\\_2023.pdf](http://www.ntia.gov/sites/default/files/2023-11/j_2021_edition_rev_2023.pdf).)

(b) NTIA Manual of Regulations and Procedures for Federal Radio Frequency Management, Annex M: Measurement Methods, January 2023 Revision (of the January 2021 Edition); IBR approved for § 26.302. (Available at [www.ntia.gov/sites/default/files/2023-11/m\\_2021\\_edition\\_rev\\_2023.pdf](http://www.ntia.gov/sites/default/files/2023-11/m_2021_edition_rev_2023.pdf).)

■ 10. Delayed indefinitely, add § 26.106 to read as follows:

**§ 26.106 Submission and filing of applications.**

(a) Applications for authorizations in the Space Launch Services must be filed in the Universal Licensing System (ULS) in accordance with part 1, subpart F, of this chapter. All modifications or renewals of licenses, assignments or transfers of control of licenses or any rights thereunder, and waiver requests associated with any of the foregoing shall be granted only upon an application filed pursuant to part 1, subpart F, as well. Applicants should also refer to the Commission rules regarding the payment of statutory charges (subpart G of part 1) and the use of the FCC Registration Number (FRN) (see subpart W of part 1).

(b) All applications and other filings using the application and notification forms listed in part 1, subpart F, of this chapter or associated schedules must be filed electronically in accordance with the electronic filing instructions provided by ULS. The Commission will

announce by public notice the deployment date of the service in ULS and provide corresponding filing instructions.

■ 11. Delayed indefinitely, add § 26.108 to read as follows:

**§ 26.108 Content of applications; registration of stations.**

(a) *Application for authorization.* Each application for authorization required by this part shall be specific and complete with regard to the information requested by the application forms in part 1, subpart F, of this chapter and associated public notice(s). Applicants must provide any additional information requested by the National Telecommunications and Information Administration (NTIA) or the frequency coordinator to complete the frequency coordination process set forth in subpart C of this part.

(b) *Station registration.* Once authorization is granted, Space Launch Services licensees must register in ULS each launch site and each corresponding station (fixed, base, itinerant, or mobile) that will be used in their space launch operations, as well as each individual launch that has completed the frequency coordination process set forth in subpart C of this part.

(c) *Update of data.* Space Launch Services licensees have a continuing obligation to update their licenses and corresponding site and station registration data as soon as the operational or technical details of a launch changes to ensure proper coordination.

■ 12. Delayed indefinitely, add § 26.202 to read as follows:

**§ 26.202 Frequency coordinator requirements.**

Once an application for a new Space Launch Services authorization is granted, each Space Launch Services licensee must submit, for each proposed launch operation, the applicable launch site and corresponding fixed, base, itinerant, and mobile stations consistent with this subpart and submit their technical and operational parameters to the space launch frequency coordinator to initiate post-grant frequency coordination. Any changes to the technical and operational parameters for a launch event that occur after completion of post-grant frequency coordination also require coordination, and these changes shall be provided to initiate an updated post-frequency grant coordination.

(a) The space launch frequency coordinator may request, and Space Launch Services licensees are required

to provide, all appropriate technical information, system requirements, and justification for requested station parameters when such information is necessary to identify and recommend the most appropriate frequency.

(b) In the 2025–2110 MHz band:

(1) *Site-based local coordination.* (i) The space launch frequency coordinator must initiate a post-grant coordination request for site-specific coordination with the local Broadcast Auxiliary Service (BAS) frequency coordinator, including the provision of all necessary technical and operational parameters for each space launch licensee, to protect BAS, Cable Television Relay Service (CARS), and Local Television Transmission Service (LTTS) operations, as well as Federal entities that have completed coordination with the BAS frequency coordinator.

(ii) The space launch frequency coordinator is not required to initiate a post-grant coordination request for site-specific coordination with the local BAS frequency coordinator if the Space Launch Services licensee provides a showing to the space launch frequency coordinator that:

(A) It has previously coordinated its proposed launch operations with the appropriate local BAS frequency coordinator and continues to comply with any conditions or agreements resulting from such prior coordination, or that it has entered into applicable coordination agreements with co-frequency entities;

(B) It has ascertained that its proposal will not constrain, preclude, nor interfere with incumbents in the band, including BAS, CARS, and LTTS licensees and previously coordinated Federal operations; and

(C) It has demonstrated in a technical showing that its proposed operation will not create more than 0.5 dB increase in the noise threshold of a receiver at a fixed or temporary fixed electronic news gathering (ENG) receive site.

(iii) Upon request, the space launch frequency coordinator and/or the Space Launch Services licensee must provide any additional information requested by the local BAS frequency coordinator regarding a pending recommendation that it has processed but has not yet been granted.

(iv) It is the responsibility of the space launch frequency coordinator to ensure that its frequency recommendations do not conflict with the frequency recommendations of the local BAS frequency coordinator. Should a conflict arise, the affected coordinators are jointly responsible for taking action to resolve the conflict, up to and including notifying the Commission and the

National Telecommunications and Information Administration (NTIA) that a launch request must be denied.

(2) *Per-launch coordination with NTIA.* (i) To protect Federal users in the band, the space launch frequency coordinator shall conduct a post-grant, per-launch coordination with NTIA by providing the Space Launch licensee's site and station registration with their corresponding technical and operational parameters to initiate the coordination process for each proposed launch.

(ii) To assist NTIA's review, the space launch frequency coordinator may provide a showing that the operational and technical parameters of a proposed launch are consistent with a prior successful coordination and that the space launch licensee continues to comply with any conditions or agreements resulting from such prior coordination or that its proposed launch is covered by an applicable coordination agreement(s) with co-frequency entities.

(c) In the 2200–2290 MHz band:

(1) *Per-launch coordination with NTIA.* (i) To protect Federal users in the band, the space launch frequency coordinator shall conduct a post-grant, per-launch coordination with NTIA by providing the Space Launch Services licensee's site and station registration with their corresponding technical and operational parameters to initiate the coordination process for each proposed launch.

(ii) To assist NTIA's review, the space launch frequency coordinator may provide a showing that the operational and technical parameters of a proposed launch are consistent with a prior successful coordination and that the space launch licensee continues to comply with any conditions or agreements resulting from such prior coordination or that its proposed launch is covered by an applicable coordination agreement(s) with co-frequency entities.

(2) [Reserved]

■ 13. Delayed indefinitely, add § 26.301 to read as follows:

**§ 26.301 Authorized bandwidth.**

The Commission shall issue licenses in the Space Launch Services with bandwidths up to and including 5 megahertz, provided that the Commission may issue licenses with a maximum bandwidth exceeding 5 megahertz upon adequate justification from a license applicant explaining why the requested bandwidth is necessary for specific space launch operations, including an explanation of why the applicant's operations cannot be

satisfied using a bandwidth of 5 megahertz or less.

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**GENERAL SERVICES ADMINISTRATION**

**48 CFR Parts 501, 502, 538, and 552**

[GSAR Case 2020–G510; Docket No. 2023–0025; Sequence No. 1]

RIN 3090–AK20

**General Services Administration Acquisition Regulation; Federal Supply Schedule Economic Price Adjustment**

**AGENCY:** Office of Acquisition Policy, General Services Administration (GSA).

**ACTION:** Final rule.

**SUMMARY:** The General Services Administration is amending the General Services Administration Acquisition Regulations (GSAR) to standardize and simplify the Multiple Award Schedule clauses for economic price adjustments. This rule removes certain economic price adjustment requirements within these clauses to better align with commercial standards and practices.

**DATES:** This rule is effective on September 4, 2024.

**FOR FURTHER INFORMATION CONTACT:** For clarification of content, contact Mr. Thomas O'Linn, Procurement Analyst, at [garpolicy@gsa.gov](mailto:garpolicy@gsa.gov) or 202–445–0390. For information pertaining to status or publication schedules, contact the Regulatory Secretariat at [GSARegSec@gsa.gov](mailto:GSARegSec@gsa.gov) or 202–501–4755. Please cite GSAR Case 2020–G510.

**SUPPLEMENTARY INFORMATION:**

**I. Background**

This final rule amends the (GSAR) to standardize and simplify the Multiple Award Schedule (Schedule) clauses for economic price adjustments.

GSA published a proposed rule in the **Federal Register** at 88 FR 78710 on November 16, 2023. One respondent submitted comments in response to the proposed rule.

**II. Discussion and Analysis**

GSA reviewed the public comments in the development of the final rule; however, no changes were made as a result of the public comments received. A discussion of the public comments received is provided as follows:

*A. Summary of Significant Changes*

There are no significant changes from the proposed rule.