

## FEDERAL COMMUNICATIONS COMMISSION

### 47 CFR Parts 0 and 25

[IB Docket No. 12-267; FCC 14-142]

### Comprehensive Review of Licensing and Operating Rules for Satellite Services

**AGENCY:** Federal Communications Commission.

**ACTION:** Proposed rule.

**SUMMARY:** In this document, the Federal Communications Commission (Commission) proposes to amend its rules for licensing and operation of space stations and earth stations for communication by radio. The proposed changes would, among other things, facilitate international coordination of proposed satellite networks; eliminate the need to assess compliance with interim milestone requirements; revise bond requirements to more effectively deter spectrum warehousing; clarify requirements for routine earth station licensing; and expand applicability of routine licensing standards.

**DATES:** Submit comments on or before December 15, 2014 and reply comments on or before January 14, 2015.

**ADDRESSES:** You may submit comments, identified by IB Docket No. 12-267, by any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments.

- *Federal Communications Commission's Web site:* <http://www.fcc.gov/cgb/ecfs>. Follow the instructions for submitting comments.

- *Paper filing:* Paper filings can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail.

For detailed instructions for submitting comments and additional information on the rulemaking process, see the **SUPPLEMENTARY INFORMATION** section of this document.

#### FOR FURTHER INFORMATION CONTACT:

William Bell (202) 418-0741 or Cindy Spiers (202) 418-1593, Satellite Division, International Bureau. For additional information concerning the information collection(s) contained in this document, contact Cathy Williams at 202-418-2918, or via the Internet at [Cathy.Williams@fcc.gov](mailto:Cathy.Williams@fcc.gov).

**SUPPLEMENTARY INFORMATION:** This is a summary of the Commission's Further Notice of Proposed Rulemaking (FNPRM) in IB Docket No. 12-267, FCC 14-142, adopted and released on September 30, 2014. The full text of this

document is available for public inspection and copying during regular business hours at the FCC Reference Information Center, Portals II, 445 12th Street SW., Room CY-A257, Washington, DC 20554 and may be downloaded from the Commission's internet Web site at [https://apps.fcc.gov/edocs\\_public/Query.do?numberFld=14-142&numberFld2=&docket=12-267&dateFld=&docTitleDesc=](https://apps.fcc.gov/edocs_public/Query.do?numberFld=14-142&numberFld2=&docket=12-267&dateFld=&docTitleDesc=). The document may also be purchased from the Commission's duplicating contractor, Best Copy and Printing, Inc., Portals II, 445 12th Street SW., Room CY-B402, Washington, DC 20554, telephone 202-488-5300, facsimile 202-488-5563, or via Web site at [www.BCPIWEB.com](http://www.BCPIWEB.com). Alternative formats are available to person with disabilities by sending email to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or calling the Consider & Governmental Affairs Bureau at 202-418-0530 (voice), or 202-418-0432 (tty).

Pursuant to §§ 1.415 and 1.419 of the Commission's rules, 47 CFR 1.415 and 1.419, interested parties may file comments and reply comments on or before the dates indicated on the first page of this document.

- *Electronic Filers:* Comments may be filed electronically using the Internet by accessing the Commission's Electronic Comment Filing System (ECFS): <http://fjallfoss.fcc.gov/ecfs2/>. See *Electronic Filing of Documents in Rulemaking Proceedings*, 63 FR 24121 (1998).

- *Paper Filers:* Parties who choose to file by paper must file an original and one copy of each filing.

- *Paper filings* can be sent by hand or messenger delivery, by commercial overnight courier, or by first-class or overnight U.S. Postal Service mail. All filings must be addressed to the Commission's Secretary, Office of the Secretary, Federal Communications Commission.

- All hand-delivered or messenger-delivered paper filings for the Commission's Secretary must be delivered to FCC Headquarters at 445 12th St. SW., Room TW-A325, Washington, DC 20554. The filing hours are 8:00 a.m. to 7:00 p.m. All hand deliveries must be held together with rubber bands or fasteners. Any envelopes and boxes must be disposed of before entering the building.

- Commercial overnight mail (other than U.S. Postal Service Express Mail and Priority Mail) must be sent to 9300 East Hampton Drive, Capitol Heights, MD 20743.

- U.S. Postal Service first-class, Express, and Priority mail must be addressed to 445 12th Street SW., Washington, DC 20554.

**People with Disabilities:** To request materials in accessible formats for people with disabilities (braille, large print, electronic files, audio format), send an email to [fcc504@fcc.gov](mailto:fcc504@fcc.gov) or call the Consumer & Governmental Affairs Bureau at 202-418-0530 (voice), 202-418-0432 (tty).

#### Summary of Further Notice of Proposed Rulemaking

In the initial Notice of Proposed Rulemaking in IB Docket 12-267, 77 FR 67172, November 8, 2012, (2012 *NPRM*), the Commission proposed extensive changes in part 25. The Satellite Industry Association (SIA) and other parties filed comments in response to the 2012 *NPRM*. In a Report and Order released in August 2013, the Commission adopted most of the changes proposed in the 2012 *NPRM* but declined to rule on recommendations from commenters that could not properly be adopted without affording further opportunity for public comment. Some of the rule changes proposed in FCC 14-142 are based on such previous recommendations. In February 2014, an FCC staff working group issued recommendations for improving the Commission's procedures and management practices and eliminating or streamlining outdated rules in a *Process Reform Report*. Some of the recommendations concerned satellite-service regulation and licensing and are considered in FCC 14-142.

#### ITU Filings for GSO FSS Space Stations

The procedure for obtaining international recognition of satellite operation in non-planned Fixed-Satellite Service (FSS) bands under the Radio Regulations of the ITU includes several steps. First, an Advance Publication of Information (API) must be filed with the ITU. An API filing requires only a very general description of a proposed satellite network. Next, a Coordination Request must be filed. A Coordination Request is "receivable" between six months and two years after the associated API filing but may be submitted to the ITU simultaneously with an API filing. The date of receipt of the Coordination Request establishes the "protection date" of a satellite network, which is the basis of international coordination priority. A proposed satellite network must be coordinated with any co-frequency satellite network with an earlier ITU protection date that, according to certain criteria, is deemed to be "affected" by the proposed network.

The Commission's International Bureau submits an API or Coordination Request to the ITU for space station

operation in specified frequency bands at a specified orbital location only after a license application for the proposed space station operation has been filed with the Commission. The information required for a Commission space station license application is more specific than that required for an API or Coordination Request and includes technical data that would not be definitely known until significant progress has been made in the design of a proposed satellite. Consequently, an operator who decides to apply to the FCC for authority for space station operation in a new band and/or orbital location might not be prepared to submit a license application for such operation for a considerable time afterward.

In view of this, the *Process Reform Report* includes a recommendation for the Commission to consider adopting a procedure for filing satellite-network APIs and Coordination Requests prior to the filing of full license applications. Several parties address this issue in comments, and all of them support this recommendation.

We tentatively agree that it would serve the public interest for the Commission to adopt an optional procedure in which submission of APIs and Coordination Requests to the Commission for filing with the ITU for GSO space station operation in non-planned FSS bands would be a first step in an optional two-step license application process. More detailed information of the kind included currently in license applications would be due later. Given the specificity of the ITU's regulations pertaining to operation in FSS planned bands, we are not proposing to follow this procedure with respect to planned-band operation. We invite comment, however, as to whether the procedure should be available for other types of proposed space station operation. We contemplate that such requests would be electronically filed and considered in order of receipt and would be treated as confidential until the Commission submits the filings to the ITU. We invite comment as to whether the filing of such a request would be subject to the requirements in part 1, subpart G of the Commission's rules pertaining to filing fees.

We propose to adopt a two-year deadline for submitting the technical information needed to complete a satellite license application.

We invite comment on whether submission of a request for filing of an API and Coordination Request with a simplified description of the satellite network and a cost-recovery declaration should suffice to secure a position in a

first-come, first-served space station application queue. A party that secures a place at the head of an application queue for space station operation in particular FSS frequency bands at a particular location in the GSO arc should not be free to walk away at some later time without any consequence, despite having preempted co-frequency applications for the same or a nearby orbital location in the meanwhile. We therefore propose a surety bond requirement, separate from the current post-licensing bond requirement in § 25.165. Such a bond would be payable if a party who has secured a spot in the first-come, first-served queue by submitting a draft API and Coordination Request fails to complete an acceptable license application on schedule or its license application is denied. We invite comment as to whether a surety bond created in connection with a request for an ITU filing should be released when the party in interest files a post-grant surety bond pursuant to § 25.165 or whether it would better serve the public interest to require an "ITU filing bond" to be maintained pending satisfaction of all milestone requirements.

A party that prefers to avoid the ITU filing bond would have the option of following the current procedure of filing a full license application concurrently with a request for submission of an API and Coordination Request. We invite comment as to whether a party should have the option to file an API and Coordination request without securing a spot in the first-come, first-served queue and without filing a bond. We also invite comment as to whether failure to meet the proposed two-year second-step filing deadline should count as a missed milestone for purposes of the "three-strikes" rule in § 25.159(d).

#### Milestones and Bonds

In order to prevent or deter spectrum warehousing, the Commission requires space station licensees to adhere to standard milestone schedules and file surety bonds. The milestone requirements for most space station licensees are codified in § 25.164 and are incorporated as conditions in license grants. Recipients of new licenses for geostationary-orbit (GSO) space stations, other than Direct Broadcast Satellite (DBS) and Satellite Digital Audio Radio Service (SDARS) space stations, are required to meet the following schedule:

- Enter into a binding contract for construction of the authorized satellite(s) by one year after the grant of the space station license;
- Complete critical design review for the satellite(s) by two years after the license grant;

- Begin construction of the satellite(s) by three years after the license grant;
- Launch and commence operation of the satellite(s) in the assigned orbital location(s) by five years after the license grant.

Recipients of new licenses for non-geostationary-orbit (NGSO) space stations are required to meet the following schedule:

- Enter into a binding contract for construction of the authorized satellite(s) by one year after the grant of the space station license;
- Complete critical design review for the satellite(s) by two years after the license grant;
- Begin construction of one satellite by two years and six months after the license grant;
- Launch and commence operation of the first satellite in the authorized orbit by three years and six months after the license grant.
- Bring all authorized satellites into operation by six years after the license grant.

These milestone schedules also apply to construction and launch of non-U.S.-licensed space stations approved for U.S. market access.

Under § 25.165, the recipient of a new license for a GSO space station of any type other than DBS and SDARS must file a surety bond in the amount of \$3 million, payable to the U.S. Treasury in the event of a milestone default, and the recipient of a new license for an NGSO constellation must file a surety bond in the amount of \$5 million. The Commission adopted the bond requirement to establish a market-based mechanism for ensuring that licensees are willing and able to proceed with satellite construction and to discourage warehousing of scarce resources. The bond amount is successively reduced when the Commission finds that the licensee has met interim milestone requirements. In the event that a licensee fails to meet a milestone deadline and the Commission does not find good cause for granting an extension of time, the license becomes void and the remaining bond amount is paid to the U.S. Treasury. We believe it is worthwhile to consider whether alternative approaches might shorten review periods, reduce administrative burdens, and increase certainty for licensees.

One possible approach is to accept corroborative affidavits from satellite manufacturers and evidence of appropriate payment, in addition to certifications from licensees, as *prima facie* proof of compliance with the contracting and CDR milestone

requirements. This would eliminate any need for submission and assessment of confidential contract and design documents in cases where such *prima facie* evidence is presented. Deciding, on a case-by-case basis, how much payment is appropriate at contract signing and upon completion of CDR could entail some adjudicatory difficulty, however. We invite further comment on this proposal.

We also invite comment on simplifying the milestone schedules. Specifically, we request comment on eliminating the milestone deadlines for contracting for satellite construction and commencing construction and retaining the CDR milestone requirement as the only intermediate milestone deadline prior to the deadline for launch. This would reduce paperwork burdens and afford more flexibility for licensees and significantly reduce administrative burdens for the Commission's staff. In addition, we invite comment on the advisability of eliminating all interim milestone requirements, which would reduce administrative burdens still further and eliminate any need for submission of confidential construction contracts or proprietary design packages. And we seek comment on making all interim milestone requirements optional, so that a party could volunteer for Commission review of any interim milestone at any time as a means of reducing its surety bond, without requiring every applicant to do the same.

We have several proposals regarding post-grant surety bonds. First, the currently prescribed bond amounts—\$3 million for GSO space stations and \$5 million for NGSO space stations—may be inadequate. These amounts were prescribed ten years ago and have never been adjusted. We propose to require bond payment amounts due in the event of default to be calculated based on the Gross Domestic Product Chain-type Price Index (GDP-CPI), so that adjustment for both past and future inflation (or deflation) will be routine and will take into account time that elapses from license grant to default, which could be as much as six years. We invite comment as to the appropriate baseline dollar amounts to be used for such calculations.

Second, from a public-interest standpoint, it is better for a satellite licensee to surrender a license soon after receiving it than to surrender it after holding it for several years—or, worse, to hold the license for five or six years and then request an unjustified extension of the milestone deadline for launch and commencement of operation. Should we therefore revise

the bond rule to provide that the amount to be paid in the event a licensee surrenders a space station authorization without placing the authorized facility into operation or is found in default of the deadline for commencing in-orbit operation will increase progressively, *pro rata*, in proportion to the time that has elapsed since the license was granted? Rather than escalating the potential payment liability from a starting point of zero, initial liability could be set at an amount substantial enough to deter parties from filing applications for strategic motives with the intention of surrendering their licenses shortly after grant. We invite comment as to whether this approach should be combined with the current policy of reducing bond liability when it is found that a party has met an interim milestone. For example, should we make interim milestone showings optional and reduce bond payment liability for licensees that choose to submit such showings and demonstrate that they have met interim milestones within prescribed time periods?

If we were to assign queuing priority based on advanced ITU filings, as proposed above, we believe that the amount to be paid pursuant to an “ITU filing bond” in the event of default should be commensurate with post-grant bond payment liability, taking into consideration the amount of time that elapses before default occurs. We invite comment on this proposal and suggestions for other approaches that could strike a balance between achieving the desired flexibility with respect to ITU filings while preventing spectrum warehousing.

#### The Two-Degree Spacing Policy

The Commission's two-degree spacing policy, which has been in effect since 1983, applies to GSO FSS operation in the conventional C-band, the conventional and extended Ku-band, and the 20/30 GHz band. “Two-degree spacing” refers to angular separation in the GSO arc between adjacent co-frequency space stations. There are several aspects to this policy, which is embodied in part 25 rules pertaining to licensing of both earth stations and space stations.

Applicants for earth station licenses authorizing transmission to GSO FSS satellites in the conventional C-band, conventional or extended Ku-band, or 20/30 GHz band must demonstrate one of two things with respect to uplink operation. One option is to show that the proposed earth stations will meet “routine” limits on off-axis EIRP density (or equivalent limits on off-axis antenna

gain and input power density) designed to prevent harmful interference with co-frequency GSO space stations at orbital locations two or more degrees from the “target” satellites that the earth stations would communicate with.

Alternatively, for proposed operation that would exceed the relevant routine limits, an applicant must submit certification from the operator(s) of the target satellite(s) that the proposed non-conforming uplink operation has been coordinated with operators of adjacent co-frequency space stations and certify that it will operate in compliance with the coordination agreements.

License applicants for GSO FSS space stations must demonstrate the following with a technical analysis: (i) Their downlink transmissions will not harmfully interfere with reception of co-frequency downlink transmissions from any previously-licensed GSO satellite less than two degrees away or with reception of co-frequency downlinks from a current or future GSO satellite two degrees away by earth stations with gain patterns consistent with the relevant routine limits in § 25.209 and (ii) uplink transmissions to their space stations will not harmfully interfere with uplink reception of any previously licensed GSO space station less than two degrees away or with uplink reception of a current or future satellite two degrees away. Space station applicants have routinely requested permission to deviate from parameters assumed for purposes of such interference analysis when permitted under the terms of subsequent coordination agreements, however, and the Commission has routinely granted such requests.

Thus, under current rules and practice, operating authority may be obtained based on coordination agreements for a GSO FSS system that does not conform to technical limits for two-degree compatibility. In the event that a two-degree-compliant U.S.-licensed space station subsequently commences co-frequency operation at an adjacent orbital location, however, the operator(s) of the non-conforming space station and/or associated earth stations will have to curtail non-conforming transmit operation adversely affecting the newcomer's system unless the newcomer consents to it, and will have to accept any downlink interference from the newcomer resulting from the use of earth station antennas with non-conforming gain patterns.

Intelsat contends that the two-degree spacing rules hinder U.S.-licensed satellite operators from providing innovative “broadband mobility”

services and services involving use of high power output to earth stations with small antennas and may place U.S.-licensed satellite operators at a competitive disadvantage compared with foreign-licensed operators that are granted access to the U.S. market. Intelsat proposes that instead of adhering to the two-degree spacing rules, the Commission should allow coordination between operators to control operational requirements and should resolve disputes based on ITU coordination priority.

We invite comment as to whether the Commission should require a new entrant to coordinate co-frequency, co-coverage operation with a U.S.-licensed operator that has been providing non-two-degree-compliant GSO FSS services without causing unacceptable interference. If we were to adopt such a policy, should coordination priority and protection rights between U.S. licensees, or operators with U.S. market access, be based on ITU filing priority, as Intelsat recommends, or should it be based on FCC application filing dates?

Section 25.140(a) requires license applicants for GSO FSS space stations to provide an interference analysis demonstrating that the proposed system will be compatible with previously authorized GSO space stations within two angular degrees of the proposed space station. Intelsat maintains that there is no need for such a showing because protection of adjacent satellites is ensured by rules requiring adherence to technical limits or coordination of non-conforming operation. Furthermore, Intelsat maintains that interference showings submitted pursuant to § 25.140(a) are often based on assumptions that may not accurately reflect the actual operational environment. We propose to amend § 25.140(a) in several respects. To begin with, for reasons stated below, we propose to remove the routine limits on the power spectral density or power flux-density of downlink transmission in the conventional Ku-band and 20/30 GHz bands from §§ 25.134, 25.138, and 25.212 and insert them in § 25.140(a) as coordination triggers for space station applicants and licensees. The rules do not currently specify routine limits for downlink transmission in the conventional or extended C-band, but taking into account the capabilities of current C-band satellites and typical operational conditions, we propose to amend § 25.140(a) to specify a 1 dBW/4 kHz coordination threshold for digital downlink transmission in the conventional or extended C-band and an 8 dBW/4 kHz coordination threshold for

analog downlink transmission in those bands.

Further, we propose to amend § 25.140(a) to allow applicants to provide certifications in lieu of an interference analysis. Under the amended rule that we propose, an applicant for a GSO FSS space station at an orbital location less than two degrees from the assigned location of a co-frequency space station could either certify that the proposed operation has been coordinated with the operator of the co-frequency satellite or submit an interference analysis demonstrating the compatibility of the proposed system with the co-frequency satellite. An applicant for space station operation (other than analog video operation) at a location two degrees or more from the nearest co-frequency satellite would not have to provide an interference analysis if it certifies that it will coordinate any uplink or downlink operation exceeding relevant routine limits with operators of co-frequency satellites within six degrees.

Because there is no EIRP density limit in the Commission's rules for analog video downlinks and the number of satellites transmitting analog video signals is gradually diminishing, we do not propose technical criteria for routine licensing of analog video space station operation. Rather, we propose to require such operation to be coordinated with operators of co-frequency satellites within six degrees of the proposed space station that are U.S.-licensed or approved for U.S. market access.

#### **The First-Come, First-Served Procedure for GSO-Like Satellite Systems**

The Commission adopted the first-come, first-served licensing procedure for "GSO-like" space stations—that is, GSO space stations designed for communication with earth stations with directional antennas—in 2003. We have requested comment on a proposal to eliminate the two-degree spacing policy and instead rely on ITU filing priority, which is also based on the first-come, first-served principle. More generally, we invite comment as to whether modification of the first-come-first-served procedure might be appropriate and how the statutory prohibition against assigning "orbital locations or spectrum used for the provision of international or global satellite communications services" by competitive bidding should affect consideration of this issue.

#### **Other Proposed Changes in Part 25**

The Commission is proposing other changes in part 25 as indicated in the following topic list. For details on these

proposals, see FCC 14–142, available for download at [https://apps.fcc.gov/edocs\\_public/Query.do?numberFld=14-142&numberFld2=&docket=12-267&dateFld=&docTitleDesc=](https://apps.fcc.gov/edocs_public/Query.do?numberFld=14-142&numberFld2=&docket=12-267&dateFld=&docTitleDesc=).

- A. Codification of Replacement Satellite Policies (Sections 25.157 and 25.158)
- B. Licensing Rules for Earth Stations that Transmit to GSO Space Stations in FSS Frequency Bands
  - 1. Overview of Current Routine Licensing Rules (Sections 25.132, 25.134, 25.138, 25.209, 25.211, 25.212, 25.218, 25.220, 25.221, 25.222, 25.223, 25.226, and 25.227)
  - 2. Definition of "theta"
  - 3. "Plane Tangent to the GSO Arc"
  - 4. Emissions Outside the Plane Tangent to the GSO Arc
  - 5. Sidelobe and Backlobe Allowances
  - 6. EIRP Density Specifications for Cross-Polarized Signals
  - 7. Limits on Aggregate EIRP Density
  - 8. Operation With Contention Protocols
  - 9. Routine Licensing Criteria for Stations Transmitting Full-Transponder Analog Video Signals
  - 10. Analog Signal Bandwidth
  - 11. Criteria for Downlink Transmission
  - 12. Alternative Routine Licensing Criteria for 20/30 GHz Earth Stations
  - 13. Routine Gain Envelopes for 17/24 GHz BSS Feeder-Link Stations
  - 14. Other Proposed Changes in §§ 25.134 and 25.212
  - 15. Clarification of the Applicability of § 25.218
  - 16. Reference Bandwidth in EIRP Density Specifications in § 25.138
  - 17. Routine Licensing Criteria for Extended C-Band Stations
  - 18. Off-Axis Gain Standards for FSS Earth Stations
  - 19. Demonstrating Conformance With Limits on Off-Axis Gain and EIRP Density
  - 20. Coordination Requirements for Non-Conforming Earth Station Operation
  - 21. Other Proposed Changes in Licensing Rules for Earth Stations on Vessels, Vehicle Mounted Earth Stations, and Earth Stations Aboard Aircraft
- C. Section 25.103 "Definitions" (Section 25.103)
  - 1. "20/30 GHz Bands"
  - 2. "Conventional C-Band" "Extended C-Band" "Conventional Ku-Band"
  - 3. "NGSO FSS Gateway Earth Station"
  - 4. "Permitted Space Station List"
  - 5. "Plane Perpendicular/Tangent to the GSO Arc"
  - 6. "Protection Areas"
  - 7. "Skew Angle"
  - 8. "Two-Degree-Compliant Space Station"
  - 9. "VSAT Network"
- D. Rules Pertaining to Dismissal of Applications (Sections 25.112 and 25.152)
- E. Section 25.113 "Station construction, launch authority, and operation of spare satellites"
- F. Section 25.114 "Applications for space station authorizations"
- G. Further Proposed Changes in § 25.115 "Applications for earth station authorizations"

- H. Section 25.117 “Modification of station license”
- I. Section 25.118 “Modifications not requiring prior authorization”
  - 1. Earth station modifications
  - 2. Fleet management rule
- J. Section 25.119 “Assignment or transfer of control of station authorization”
- K. Section 25.129 “Equipment authorization for portable earth-station transceivers”
- L. Section 25.130 “Filing requirements for transmitting earth stations”
- M. Section 25.131 “Filing requirements and registration for receive-only earth stations”
- N. Section 25.133 “Period of construction; certification of commencement of operation”
- O. Other Proposed Changes in § 25.138
- P. Service-Specific Space Station Licensing Rules
  - 1. Section 25.143 “Licensing provisions for the 1.6/2.4 GHz Mobile-Satellite Service and 2 GHz Mobile-Satellite Service”
  - 2. Section 25.145 “Licensing provisions for the Fixed-Satellite Service in the 20/30 GHz bands”
  - 3. Section 25.146 “Licensing and operating rules for the non-geostationary orbit Fixed-Satellite Service in the 10.7 GHz-14.5 GHz bands”
  - 4. Section 25.147 “Licensing provision for NGSO MSS feeder downlinks in the band 6700–6875 MHz”
  - 5. Section 25.264 “Requirements to facilitate reverse-band operation in the 17.3–17.8 GHz band of 17/24 GHz Broadcasting-Satellite Service and Direct Broadcast Satellite Service space stations”
  - 6. Polarization Requirements for FSS Space Stations (Sections 25.210)
- Q. Section 25.156 “Consideration of applications”
- R. Section 25.159 “Limits on pending applications and unbuilt satellite systems”
- S. Section 25.163 “Reinstatement”
- T. Section 25.165 “Posting of bonds”
- U. Section 25.202 “Frequencies, frequency tolerance, and emission limits”
- V. Section 25.203 “Choice of sites and frequencies”
- W. Operating Rules for Earth Stations
  - 1. Section 25.204 “Power limits for earth stations”
  - 2. Section 25.205 “Minimum angle of antenna elevation”
  - 3. Section 25.211 “Analog video transmissions in the Fixed-Satellite Service”
  - 4. Section 25.258 “Sharing between NGSO MSS Feeder links Stations and GSO FSS services in the 29.25–29.5 GHz bands”
- X. Section 25.283 “End-of-life disposal”

#### Regulatory Impact Conclusion

The amendments we propose would update the Commission’s rules for satellite services to reflect evolving technology, eliminate unnecessary technical and information-filing requirements, and reorganize, clarify,

and simplify existing requirements. We believe that these changes would serve the public interest by promoting compliance with the Commission’s operating rules, improving the ability of the public and Commission to assess the interference potential of proposed operations, affording more flexibility for incorporating state-of-the-art design, easing administrative burdens, and facilitating rapid deployment of new and improved satellite services. We believe that these benefits would outweigh any resultant costs and that the rule changes would reduce net costs, on average, for applicants and licensees. We invite comment on these conclusions.

#### Ex Parte Presentations

We will continue to treat this proceeding as a “permit-but-disclose” proceeding in accordance with the Commission’s *ex parte* rules. Persons making *ex parte* presentations must file a copy of any written presentation or a memorandum summarizing any oral presentation within two business days after the presentation (unless a different deadline applicable to the Sunshine period applies). Persons making oral *ex parte* presentations are reminded that memoranda summarizing the presentation must (1) list all persons attending or otherwise participating in the meeting at which the *ex parte* presentation was made, and (2) summarize all data presented and arguments made during the presentation. If the presentation consisted in whole or in part of the presentation of data or arguments already reflected in the presenter’s written comments, memoranda or other filings in the proceeding, the presenter may provide citations to such data or arguments in his or her prior comments, memoranda, or other filings (specifying the relevant page and/or paragraph numbers where such data or arguments can be found) in lieu of summarizing them in the memorandum. Documents shown or given to Commission staff during *ex parte* meetings are deemed to be written *ex parte* presentations and must be filed consistent with 47 CFR 1.1206(b). In proceedings governed by 47 CFR 1.49(f) or for which the Commission has made available a method of electronic filing, written *ex parte* presentations and memoranda summarizing oral *ex parte* presentations, and all attachments thereto, must be filed through the electronic comment filing system available for that proceeding, and must be filed in their native format (e.g., .doc, .xml, .ppt, searchable .pdf). Participants in this proceeding should familiarize

themselves with the Commission’s *ex parte* rules.

#### Initial Regulatory Flexibility Analysis

As required by the Regulatory Flexibility Act of 1980, as amended,<sup>1</sup> the Commission has prepared an Initial Regulatory Flexibility Analysis (IRFA) of the possible economic impact on small entities of the rule changes proposed in the *FNPRM*. The IRFA is set forth in FCC 14–142 as Appendix D and is summarized here. Written public comments are requested on the IRFA. Comments must be identified as responses to the IRFA and must be filed by the comment deadlines specified above.

The Regulatory Flexibility Act requires that a regulatory flexibility analysis be prepared for rulemaking proceedings unless the agency certifies that the rule will not have a significant economic impact on a substantial number of “small entities.” The RFA generally defines the term “small entity” as referring to any “small business,” “small organization,” or “small governmental jurisdiction.” A small business concern is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).<sup>2</sup> The SBA considers a satellite telecommunications firm to be small if it has \$32.5 million or less in annual receipts. Some earth station applicants and licensees that qualify as small firms by this criterion might be affected rule changes proposed in the *FNPRM*.

The *FNPRM* seeks comment on a variety of proposals for revision of rules governing licensing and operation of space stations and earth stations for provision of satellite communication services. Specifically, it proposes to:

- Allow space station applicants to file through the Commission a satellite network with the International Telecommunication Union up to two years before filing a complete space station application with the Commission.
- Eliminate some or all interim space station construction milestone requirements and simplify the showing needed to demonstrate compliance with the CDR milestone, if it is retained.
- Modify the space station bond requirements to provide better incentives against spectrum warehousing.

<sup>1</sup> 5 U.S.C. 601 *et seq.*, as amended by the Contract With America Advancement Act of 1996, Public Law 104–121, 110 Stat. 847 (1996).

<sup>2</sup> Small Business Act, 15 U.S.C. 632 (1996).

- Modify the two-degree spacing policy to permit continued operation of a non-two-degree compliant satellite network to the extent that such operation can be coordinated with other operators prior to the introduction of a nearby two-degree-compliant satellite.

- Eliminate the requirement for a space station applicant that starts constructing its satellite prior to filing an application with the Commission to notify the Commission in writing that it is doing so at its own risk.

- Clarify the requirements to limit aggregate uplink power density from multiple earth stations transmitting to the same satellite.

- Provide for the automatic grant of applications for repositioning of space stations with a small offset from the originally authorized orbital location, and for minor repointing of space station antennas.

- Allow earth station operators to communicate with a replacement satellite deployed with a small offset from the originally authorized satellite without prior Commission authorization.

- Extend the frequency bands in which routine earth station licensing is permitted.

- Expand routine earth station license qualification options for 20/30 GHz earth station applicants.

- Clarify earth station off-axis antenna radiation pattern requirements, and the ranges over which the off-axis radiated power can exceed the specified limits.

- Permit earth station applicants to file off-axis antenna radiation charts instead of tables except in off-axis angular regions where the off-axis radiation exceeds specified limits.

- Eliminate the requirement for portable earth station manufacturers to demonstrate compliance with the radiated power limits in § 25.204 of the Commission's rules.

- Lower the minimum permissible elevation angle for earth stations operating in bands not shared with terrestrial services from five degrees to three degrees above the horizontal plane.

- Eliminate the restrictions on the center frequencies on which analog video transmissions in the 3700–4200 MHz band can be conducted.

- Eliminate antenna polarization requirements for space stations operating in the 4/6 GHz bands.

- Eliminate the cross-polarization requirement for FSS space stations.

- Eliminate a requirement for earth station applicants to measure and specify mid-band antenna gain.

- Eliminate a requirement to license receive-only earth stations communicating with non-U.S. licensed space stations approved for U.S. market access.

- Update and improve definitions.

Many of these proposed changes would reduce regulatory burdens for earth station applicants and licenses. The *FNPRM* invites comment from all interested parties. Small entities are encouraged to bring to the Commission's attention any specific concerns they may have with the proposals outlined in the *FNPRM*, which the Commission will consider in reaching its final conclusions and taking action in this proceeding.

#### Paperwork Reduction Act

The *FNPRM* proposes new and modified information collection requirements and also proposes to eliminate a number of existing information collection requirements. The Commission, as part of its continuing effort to reduce paperwork burdens, invites the general public and OMB to comment on the proposed information collection requirements. In addition, pursuant to the Small Business Paperwork Relief Act of 2002,<sup>3</sup> we seek specific comment on how we might further reduce the information collection burden for small business concerns with fewer than 25 employees.<sup>4</sup>

#### Ordering Clauses

*It is ordered*, pursuant to sections 4(i), 7(a), 11, 303(c), 303(f), 303(g), and 303(r) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 157(a), 161, 303(c), 303(f), 303(g), and 303(r), that the Further Notice of Proposed Rulemaking in IB Docket No. 12-267 is adopted.

*It is further ordered* that the Commission's Consumer and Governmental Affairs Bureau, Reference Information Center, will send a copy of this Further Notice of Proposed Rulemaking, including the initial regulatory flexibility act analysis, to the Chief Counsel for Advocacy of the Small Business Administration, in accordance with section 603(a) of the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.* (1981).

#### List of Subjects in 47 CFR Part 25

Definitions, Earth stations, Space stations.

<sup>3</sup> Public Law 107-198.

<sup>4</sup> 44 U.S.C. 3506(c)(4).

Federal Communications Commission.

**Sheryl D. Todd,**

*Deputy Secretary, Office of the Secretary, Office of Managing Director.*

For the reasons discussed in the preamble, the Federal Communications Commission proposes to amend 47 CFR parts 0 and 25 as follows:

#### PART 0—COMMISSION ORGANIZATION

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

**Authority:** Sec. 5, 48 Stat. 1068, as amended, 47 U.S.C. 155, 255, unless otherwise noted.

■ 2. Amend § 0.457 by adding paragraph (d)(1)(vii)(C) to read as follows:

#### § 0.457 Records not routinely available for public inspection.

\* \* \* \* \*

(d) \* \* \*

(1) \* \* \*

(vii) \* \* \*

(C) Draft APIs and Coordination

Requests filed pursuant to § 25.110(b)(3) are not routinely available for public inspection before the Commission submits them to the ITU. Such ITU submissions will be announced by public notice pursuant to § 25.151(a).

#### PART 25—SATELLITE COMMUNICATIONS

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

**Authority:** Interprets or applies sections 4, 301, 302, 303, 307, 309, 319, 332, 705, and 721 of the Communications Act, as amended, 47 U.S.C. 154, 301, 302, 303, 307, 309, 319, 332, 605, and 721, unless otherwise noted.

#### § 25.103 [Amended].

■ 4. Amend § 25.103 as follows:

- a. Remove the definitions of “12/14 GHz band” and “C-band”;
- b. Revise the definition of “20/30 GHz bands”;
- c. Add definitions of “Conventional C-band,” “Conventional Ku-band,” and “Extended C-band”;
- d. Revise the definition of “NGSO FSS gateway earth station”;
- e. Add definitions of “Plane perpendicular to the GSO arc” and “Plane tangent to the GSO arc”;
- f. Revise the definition of “Protection areas”;
- g. Add definitions of “Skew angle,” “Two-degree-compliant space station,” and “VSAT network.”

\* \* \* \* \*

*20/30 GHz bands.* The 18.3–18.8 GHz (space-to-Earth), 19.7–20.2 GHz (space-to-Earth), 28.35–28.6 GHz (Earth-to-space), and 29.25–30.0 GHz (Earth-to-

space) frequency bands, which the Commission has designated as primary for GSO FSS operation.

\* \* \* \* \*

*Conventional C-band.* The 3700–4200 MHz (space-to-Earth) and 5925–6425 MHz (Earth-to-space) FSS frequency bands.

*Conventional Ku-band.* The 11.7–12.2 GHz (space-to-Earth) and 14.0–14.5 GHz (earth-to-space) FSS frequency bands.

\* \* \* \* \*

*Extended C-band.* As used in this part, this term refers to the 3600–3700 MHz (space-to-Earth), 5850–5925 MHz (Earth-to-space), 6425–6700 (Earth-to-space), and 6700–7025 MHz (bi-directional) FSS frequency bands.

\* \* \* \* \*

*NGSO FSS gateway earth station.* An earth station or complex of multiple earth station antennas supporting the routing and switching functions of an NGSO FSS system. An NGSO FSS gateway earth station does not originate or terminate communication traffic, but interconnects multiple user-operated earth stations operating in other frequency bands with primary terrestrial networks, such as the public switched telephone network and Internet networks, communicating with the user-operated earth stations via links with NGSO satellites. An NGSO FSS gateway earth station may also be used for telemetry, tracking, and command transmissions and is not for the exclusive use of any customer.

\* \* \* \* \*

*Plane perpendicular to the GSO arc.* The plane that is perpendicular to the “plane tangent to the GSO arc,” as defined below, and includes a line between the earth station in question and the GSO space station that it is communicating with.

*Plane tangent to the GSO arc.* The plane defined by the location of an earth station’s transmitting antenna and a line in the equatorial plane that is tangent to the GSO arc at the location of the GSO space station that the earth station is communicating with.

\* \* \* \* \*

*Protection areas.* The geographic regions where U.S. Department of Defense meteorological satellite systems or National Oceanic and Atmospheric Administration meteorological satellite systems, or both such systems, receive signals from low earth orbiting satellites. Also, areas around NGSO MSS feeder-link earth stations in the 1.6/2.4 GHz Mobile-Satellite Service determined in the manner specified in § 25.203(j).

\* \* \* \* \*

*Skew angle.* The angle between the minor axis of an axially asymmetric antenna beam and the plane tangent to the GSO arc.

\* \* \* \* \*

*Two-degree-compliant space station.* A GSO FSS space station operating in the conventional or extended C-band, the conventional or extended Ku-band, or the 20/30 GHz bands within the routine limits on downlink PSD or PFD specified in § 25.140(a)(3) and communicating only with earth stations operating in conformance with routine uplink parameters specified in §§ 25.134, 25.138(a), 25.211(d), 25.212(c), (d), or (f), 25.218, 25.221(a)(1) or (a)(3), 25.222(a)(1) or (a)(3), 25.223(b), 25.226(a)(1) or (a)(3), or § 25.227(a)(1) or (a)(3).

\* \* \* \* \*

*VSAT network.* A network consisting of “remote” earth stations with small antennas that communicate via one or more FSS space stations, which usually include one or more “hub” or “gateway” earth stations that route messages and may perform other network control functions.

■ 5. Amend § 25.110 by revising paragraphs (b) and (d) to read as follows:

#### § 25.110 Filing of applications, fees, and number of copies.

\* \* \* \* \*

(b) Submitting your application.

(1) All earth station license applications must be filed electronically on Form 312 in accordance with the applicable provisions of part 1, subpart Y of this chapter.

(2) Except as provided in paragraph (b)(3) of this section, applications for space station licenses must be filed electronically on Form 312 in accordance with the applicable provisions of part 1, subpart Y of this chapter and include all information required by § 25.114.

(3) A license application for a GSO FSS space station not subject to the provisions in Appendix 30A or 30B of the ITU’s Radio Regulations may be submitted in two steps, as follows:

(i) Such an application may be initiated by filing, in accordance with the applicable provisions of part 1, subpart Y of this chapter, a draft API and Coordination Request for proposed space station operation in specified frequency bands at a specified orbital location with a letter signed by the party in interest or a designated representative requesting that the draft API and Coordination Request be submitted to the ITU and a declaration of acceptance of ITU cost-recovery responsibility in accordance with § 25.111(d). Such a

filing need not include a completed Form 312.

(ii) An application initiated pursuant to paragraph (b)(3)(i) of this section may be completed by filing a complete Form 312 for the proposed space station and any other information required by § 25.114 within two years of the date of the public notice announcing the filing of the API and Coordination Request.

\* \* \* \* \*

(d) An applicant must pay the appropriate filing fee in accordance with part 1, subpart G of this chapter, at the time when it files Form 312.

■ 6. Amend § 25.112 by revising the section heading, the first sentence in paragraph (b), and paragraph (c), and adding paragraph (d) to read as follows:

#### § 25.112 Dismissal and return of applications.

\* \* \* \* \*

(b) Applications for space station authority found defective under paragraph (a)(3) or (a)(4) of this section will not be considered. \* \* \*

(c) The Commission will dismiss an application for failure to respond substantially within a specified time period to official correspondence or requests for additional information. Dismissal will be without prejudice unless the application is mutually exclusive pursuant to § 25.155, in which case it will be dismissed with prejudice.

(d) An application will be dismissed without prejudice as a matter of right if the applicant requests its dismissal prior to final Commission action.

■ 7. Amend § 25.113 by revising paragraphs (f) through (h) and adding paragraph (i) to read as follows:

#### § 25.113 Station construction, deployment approval, and operation of spare satellites.

\* \* \* \* \*

(f) Construction permits are not required for U.S.-licensed space stations, except for stations that the applicant proposes to operate to disseminate program content to be received by the public at large, rather than only by subscribers. Construction of a station for which a construction permit is not required may commence, at the applicant’s own risk, prior to grant of a license.

(g) Except as set forth in paragraphs (h) and (i) of this section, approval for orbital deployment and a station license (*i.e.*, operating authority) must be applied for and granted before a space station may be deployed and operated in orbit. Approval for orbital deployment may be requested in an application for a space station license. However, an application for authority to deploy and operate an on-ground spare

satellite will be considered pursuant to the following procedures:

(1) Applications for deployment and operation of an on-ground spare NGSO-like satellite will be considered pursuant to the procedures set forth in § 25.157, except as set forth in paragraph (g)(3) of this section.

(2) Applications for deployment and operation of an on-ground spare GSO-like satellite will be considered pursuant to the procedures set forth in § 25.158, except as set forth in paragraph (g)(3) of this section.

(3) Neither paragraph (g)(1) nor (g)(2) of this section will apply in cases where the space station to be deployed is determined to be an emergency replacement for a previously authorized space station that has been lost as a result of a launch failure or a catastrophic in-orbit failure.

(h) Operators of NGSO satellite systems licensed by the Commission need not file separate applications to operate technically identical in-orbit spares deployed pursuant to a blanket license granted under § 25.114(a). However, the licensee must notify the Commission within 30 days of bringing an in-orbit spare into operation and certify that its activation has not increased the number of operating space stations above the number previously authorized and that the licensee has determined by measurement that the activated spare is operating within the terms of the license.

(i) *Replacement of Space Stations within the System License Term.* An operator of NGSO space stations under a blanket license granted by the Commission need not apply for license modification to deploy and operate technically identical replacement satellites in a previously-authorized orbit within the term of the system authorization. However, the licensee must notify the Commission of the intended launch at least thirty days in advance and certify that its operation of the additional space station(s) will not increase the number of operating space stations above the maximum number specified in the license.

■ 8. Amend § 25.114 by removing paragraph (c)(13) and revising paragraphs (a), (b), (c)(4)(vi)(D), (d)(10), (d)(15)(i), and (d)(15)(iii) and (iv) to read as follows:

#### § 25.114 Applications for space station authorizations.

(a)(1) A license application filed pursuant to § 25.110(b)(2) for a GSO space station or NGSO space station or space station constellation must comprise a comprehensive proposal and must be submitted on FCC Form 312,

Main Form and Schedule S, with attached exhibits required by paragraph (d) of this section.

(2) An application for blanket authority for an NGSO constellation of space stations that are not all technically identical must provide the information required by paragraphs (c) and (d) of this section for each type of station in the constellation.

(3) For an application filed pursuant to the two-step procedure in § 25.110(b)(3), the filing pursuant to § 25.110(b)(3)(ii) must be submitted on FCC Form 312, Main Form and Schedule S, with attached exhibits as required by paragraph (d) of this section, and must constitute a comprehensive proposal.

(b) Each application for a new or modified space station authorization must contain the formal waiver required by section 304 of the Communications Act, 47 U.S.C. 304.

(c) \* \* \*

(4) \* \* \*

(vi) \* \* \*

(D) For a space station with steerable beams that are not shapeable, specify the applicable contours, as defined in paragraph(c)(4)(vi)(A) or (B) of this section, with a description of a proposed coverage area for each steerable beam or provide the contour information described in paragraph (c)(4)(vi)(C) of this section for each steerable beam.

(d) \* \* \*

(10) Applications for space station authorizations in the 1.6/2.4 GHz or 2 GHz Mobile-Satellite Service must include information required by § 25.143(b);

\* \* \* \* \*

(15) \* \* \*

(i) Except as set forth in paragraph (d)(15)(ii) of this section, an applicant proposing to operate in the 17.3–17.7 GHz frequency band must demonstrate that the proposed space station will comply with the power flux density limits in § 25.208(w).

\* \* \* \* \*

(iii) An applicant proposing to provide international service in the 17.7–17.8 GHz band must certify that it will meet the power flux density limits in § 25.208(c).

(iv) Any information required by §§ 25.264(a)(6), 25.264(b)(4), or 25.264(d).

\* \* \* \* \*

■ 9. Amend § 25.115 as follows:

- a. Revise paragraphs (a)(2)(iii) through (vii);
- b. Remove paragraphs (a)(2)(viii) and (ix);
- c. Revise paragraph (c)(1);

■ d. Remove from paragraph (c) the terms “CSAT” and “CSATs” wherever they appear;

■ e. Revise paragraph (e), paragraph (g) introductory text, and paragraphs (g)(1) and (2); and

■ f. Remove and reserve paragraph (h).

#### § 25.115 Application for earth station authorizations.

(a) \* \* \*

(2) \* \* \*

(iii) The application meets all relevant routine licensing criteria in §§ 25.134, 25.211, or 25.212 or includes information filed pursuant to paragraph (g)(1) of this section indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in §§ 25.138(a) or 25.218; and

(iv) Operation of the proposed station has been successfully coordinated with terrestrial systems, if the station would transmit in the 5925–6425 MHz band; and

(v) The application includes an environmental impact statement pursuant to § 1.1311 of this chapter, if required; and

(vi) The applicant does not propose to communicate via non-U.S.-licensed satellites not on the Permitted Space Station List; and

(vii) If the proposed station(s) will transmit in the 28.35–28.6 GHz and/or 29.5–30 GHz bands, the applicant proposes to communicate only via satellites for which coordination has been completed pursuant to Footnote US334 of the U.S. Table of Frequency Allocations with respect to Federal Government systems authorized on a primary basis, under an agreement previously approved by the Commission and the National Telecommunications and Information Administration, and the applicant certifies that it will operate consistently with the agreement.

\* \* \* \* \*

(c)(1) *Large Networks of Small Antennas operating in the 11.7–12.2 GHz and 14.0–14.5 GHz frequency bands with U.S.-licensed or non-U.S.-licensed satellites for domestic or international services.* Applications to license small antenna network systems operating in the 11.7–12.2 GHz and 14.0–14.5 GHz frequency band under blanket operating authority may be filed on FCC Form 312 or Form 312EZ, with a Schedule B for each large (5 meters or larger) hub station and each

representative type of small antenna (less than 5 meters) operating within the network.

\* \* \* \* \*

(e) License applications for earth stations operating in any portion of the

18.3–20.2 GHz and 28.35–30.0 GHz bands must be filed on FCC Form 312, Main Form and Schedule B, and must include any information required by paragraph (g) or (j) of this section or by § 25.130. An applicant may request authority for operation of GSO FSS earth stations in the 20/30 GHz bands without specifying the location of user terminals but must specify the number of terminals to be covered by the license, the geographic area(s) in which they will operate, and the location of hub and/or gateway stations.

\* \* \* \* \*

(g) Applications for earth stations that will transmit to geostationary satellites in any portion of the 5850–7025 MHz, 12.75–13.25 GHz, 13.75–14.5 GHz, 24.75–25.25 GHz, 28.35–28.6 GHz, or 29.25–30.0 GHz band must include, in addition to the particulars of operation identified on Form 312 and associated Schedule B, the information specified in either paragraph (g)(1) or (2) below for each earth station antenna type.

(1) Specification of off-axis EIRP density calculated from measurements made consistent with the requirements in § 25.132(b)(1), in accordance with the following requirements. For purposes of this rule, the “off-axis angle” is the angle in degrees from a line between an earth station antenna and the target satellite.

(i) A plot of maximum co-polarized EIRP density in the plane tangent to the GSO arc, for off-axis angles from minus 180° to plus 180°;

(ii) A plot of maximum cross-polarized EIRP spectral density in the plane tangent to the GSO arc at off-axis angles from minus 10° to plus 10°;

(iii) A plot of maximum co-polarized EIRP density in the plane perpendicular to the GSO arc at off-axis angles from 0° to plus 30°;

(iv) A plot of maximum cross-polarized EIRP density in the plane tangent to the GSO arc at off-axis angles from minus 10° to plus 10°;

(v) A plot of maximum cross-polarized EIRP density in the plane perpendicular to the GSO arc at off-axis angles from minus 10° to plus 10°;

(vi) The relevant off-axis EIRP density envelopes in §§ 25.138, 25.218, 25.221, 25.222, 25.223, 25.226, or 25.227 must be superimposed on plots submitted pursuant to paragraphs (i) through (v) above.

(vii) The showing must include a supplemental table for each off-axis angular range in which the relevant routine EIRP density envelope will be exceeded, specifying angular coordinates in degrees off-axis and corresponding calculated off-axis EIRP

density at 0.2 degree increments over the angular range in which the routine envelope will be exceeded and one degree on each side of that range.

(2) An applicant that certifies pursuant to § 25.132(a)(1) that a proposed antenna's measured gain pattern conforms to relevant standards in § 25.209(a) and (b) and that input power density to the antenna will not exceed a relevant limit in §§ 25.134, 25.211, or 25.212 need not provide a showing pursuant to paragraph (g)(1) of this section for operation with that antenna.

\* \* \* \* \*

■ 10. Amend § 25.117 by adding paragraph (h) to read as follows:

**§ 25.117 Modification of station license.**

\* \* \* \* \*

(h) Unless otherwise ordered by the Commission, an application for any of the following kinds of modification of the operation of a GSO space station will be deemed granted 35 days after the date of the public notice that the application has been accepted for filing, provided no objection is filed during the 30-day notice period and the application does not propose a change that would be inconsistent with a Commission rule or require modification of the BSS plan in Appendix 30 or the associated feeder link plan in Appendix 30A of the ITU Radio Regulations.

(1) Relocation of a DBS or GSO FSS space station by no more than 0.15 degrees from the initially authorized orbital location; or

(2) Repositioning one or more antenna beams by no more than 0.3 angular degrees from a line between the space station and the initially authorized boresight location(s).

■ 11. Amend § 25.118 by revising paragraphs (a), (b), and (e) to read as follows:

**§ 25.118 Modifications not requiring prior authorization.**

(a) *Earth station modifications, notification required.* Earth station licensees may make the following modifications without prior Commission authorization, provided they notify the Commission, using FCC Form 312 and Schedule B, within 30 days of the modification. The notification must be filed electronically through the International Bureau Filing System (IBFS) in accordance with the applicable provisions of part 1, subpart Y of this chapter.

(1) Authorized VSAT earth station operators may add VSAT remote terminals without prior authorization, provided that they have complied with

all applicable frequency coordination procedures in accordance with § 25.251.

(2) A licensee providing service on a private carrier basis may change its operations to common carrier status without obtaining prior Commission authorization. The licensee must notify the Commission using Form 312 within 30 days after the completed change to common carrier status.

(3) An earth station operator may change a point of communication without prior authorization, provided that the operator does not repoint the earth station's antenna and that (i) the change results from a space station relocation described in paragraph (e) of this section, or (ii) the new point of communication is a replacement GSO space station operated by the operator of the original point of communication within 0.15 degrees of orbital longitude of the same location, with authority to serve the U.S., and the change does not entail any increase in the earth station's EIRP or EIRP density.

(4) Licensees may make other changes to their authorized earth stations without prior authority from the Commission, provided the modification does not involve:

- (i) An increase in EIRP or EIRP density (either main lobe or off-axis);
- (ii) A change in operating frequencies;
- (iii) A change from the originally authorized coordinates of more than 1 second in latitude or longitude for stations operating in frequency bands shared with terrestrial systems or more than 10 seconds of latitude or longitude for stations operating in frequency bands not shared with terrestrial systems;
- (iv) A change in polarization;
- (v) An increase in antenna height;
- (vi) Antenna repointing; or
- (iv) A change in the location of a remote control point.

(b) *Earth station license modifications, notification not required.* Notwithstanding paragraph (a) of this section, equipment in an authorized earth station may be replaced without prior authorization and without notifying the Commission if the new equipment is electrically identical to the existing equipment.

\* \* \* \* \*

(e) *Relocation of GSO space stations.* A space station licensee may relocate a GSO space station without prior authorization, but upon 30 days prior notice to the Commission and any potentially affected licensed spectrum user, provided that the operator meets the following requirements. The notification must be filed electronically on Form 312 through the International

Bureau Filing System (IBFS) in accordance with the applicable provisions of part 1, subpart Y of this chapter:

(1) The space station will be relocated to a position within  $\pm 0.15$  degrees of another orbit location assigned to the same licensee.

(2) The licensee certifies that the space station will operate after the relocation within the technical parameters authorized and coordinated for the space station previously assigned to that location.

(3) The licensee certifies that it will comply with all the conditions of its license for operation at the changed location.

(4) The licensee certifies that it will limit operations of the space station to Tracking, Telemetry, and Command (TT&C) functions during the relocation and satellite drift transition period.

(5) The licensee certifies that it has coordinated the station-keeping volume of the relocated satellite with operators of adjacent space stations.

(6) The licensee certifies that the relocation will not result in a lapse of service for any current customer.

(7) If the space station to be relocated is a DBS space station, the licensee certifies that there will be no increase in interference due to the operations of the relocated space station that would require the Commission to submit a proposed modification to the ITU Appendix 30 Broadcasting-Satellite Service ("BSS") Plan and/or the Appendix 30A feeder link Plan to the ITU Radiocommunication Bureau. A DBS licensee that meets this certification requirement is not subject to the requirements in paragraph (e)(2) of this section.

(8) A DBS licensee must also certify that it will meet the geographic service requirements in § 25.148(c) after the relocation.

■ 12. Amend § 25.129 by revising paragraph (c) to read as follows:

#### **§ 25.129 Equipment authorization for portable earth-station transceivers.**

(c) In addition to the information required by §§ 1.1307(b) and 2.1033(c) of this chapter, applicants for certification required by this section must submit any additional equipment test data necessary to demonstrate compliance with pertinent standards for transmitter performance prescribed in §§ 25.138, 25.202(d) and (f), and 25.216, must submit the statements required by § 2.1093(c) of this chapter, and must demonstrate compliance with the labeling requirement in § 25.285(b).

■ 13. Amend § 25.130 by revising paragraph (b), paragraph (g) introductory text, and the note to paragraph (g) to read as follows:

#### **§ 25.130 Filing requirements for transmitting earth stations.**

(b) A frequency coordination analysis in accordance with § 25.203(b) must be provided for earth stations transmitting in the frequency bands shared with equal rights between terrestrial and space services, except applications for user transceiver units associated with the NVNG mobile-satellite service, which must instead provide the information required by § 25.135, and applications for 1.6/2.4 GHz MSS user transceivers, which must demonstrate that the transceivers will operate in compliance with relevant requirements in § 25.213. Also, applications for transmitting earth stations must include any notification or demonstration required by any other relevant provision in § 25.203.

(g) Parties may apply, either in an initial application or an application for modification of license, for operating authority for multiple transmitting FSS earth stations that are not eligible for blanket or network licensing under another section of this part in the following circumstances:

**Note to Paragraph (g):** This paragraph does not apply to VSAT network applications filed pursuant to §§ 25.115(c) or 25.218; applications for 20/30 GHz hub stations filed pursuant to § 25.115(e); applications for NGSO FSS gateway earth stations filed pursuant to § 25.115(f); applications filed pursuant to §§ 25.221, 25.222, 25.226, or 25.227; or applications for 29 GHz NGSO MSS feeder link stations in a complex as defined in § 25.257.

■ 14. Amend § 25.131 by revising paragraphs (b) and (j)(2) to read as follows:

#### **§ 25.131 Filing requirements and registration for receive-only earth stations.**

(b) Receive-only earth stations in the Fixed-Satellite Service that operate with U.S.-licensed space stations, or with non-U.S.-licensed space stations that have been duly approved for U.S. market access, may be registered with the Commission in order to protect them from interference from terrestrial microwave stations in bands shared co-equally with the Fixed Service in accordance with the procedures of §§ 25.203 and 25.251, subject to the stricture in § 25.209(e).

(j) \* \* \*

(2) Operators of receive-only earth stations need not apply for license authority to receive transmissions from non-U.S.-licensed space stations that have been duly approved for U.S. market access, provided the space station operator and earth station operator comply with all applicable rules in this chapter and with applicable conditions in the Permitted Space Station List or market-access authorization.

■ 15. Amend § 25.132 by revising the section heading and paragraphs (a) and (b) to read as follows:

#### **§ 25.132 Verification of earth station antenna performance.**

(a)(1) Except as provided in paragraph (a)(2) of this section, applications for transmitting earth stations in the Fixed-Satellite Service, including feeder-link stations, must include certification that the applicant has reviewed the results of a series of radiation pattern tests performed by the antenna manufacturer on representative equipment in representative configurations, and the test results demonstrate that the equipment meets relevant off-axis gain standards in § 25.209, measured in accordance with paragraph (b)(1) of this section. Applicants and licensees must be prepared to submit the radiation pattern measurements to the Commission on request.

(2) Applicants that specify off-axis EIRP density pursuant to § 25.115(g)(1) are exempt from the certification requirement in paragraph (a)(1) of this section.

(b)(1) For purposes of paragraph (a)(1) of this section and § 25.115(g)(1), the following measurements on a production antenna performed on calibrated antenna range must be made at the top and bottom of each frequency band assigned for uplink transmission:

(i)(A) Co-polarized gain in the azimuth plane must be measured across a range extending to 180 degrees on each side of the main-lobe axis, and the measurements must be represented in two plots: One across the entire angular range of  $\pm 180$  degrees from the main-lobe axis and the other across  $\pm 10$  degrees from the main-lobe axis.

(B) Co-polarized gain must be measured from 0 to 30 degrees from beam peak in the elevation plane.

(ii) Cross-polarization gain must be measured across a range of plus and minus 10 degrees from beam peak in the azimuth and elevation planes.

(iii) Main beam gain.

(iv) For antennas with asymmetric apertures or beams, where the minor axis of the antenna beam (major axis of

the antenna aperture) will not always be aligned parallel to the plane tangent to the GSO arc, measurements must be made at the worst-case skew angle at which the antenna will operate.

(2) The relevant envelope specified in § 25.209 must be superimposed on each measured pattern.

\* \* \* \* \*

■ 16. Amend § 25.133 by removing and reserving paragraph (c), and revising paragraphs (a)(2), (b)(1)(v) and (vi), and (b)(2) to read as follows:

**§ 25.133 Period of construction; certification of commencement of operation.**

(a) \* \* \*

(2) Operation of a network of earth stations at unspecified locations under an initial blanket license must commence within 12 months from the date of the license grant unless the Commission orders otherwise.

(b)(1) \* \* \*

(v) A certification that the facility as authorized has been completed and that each antenna has been tested and found to perform within authorized gain patterns or off-axis EIRP density levels; and

(vi) The date when the earth station became operational.

(2) For FSS earth stations authorized under a blanket license, the licensee must notify the Commission when the earth station network commences operation. The notification should include the information described in paragraphs (b)(1)(i) through (iv) of this section and a certification that each hub antenna, and each type of antenna used in remote stations in the network, has been tested and found to perform within authorized gain patterns or off-axis EIRP density levels.

\* \* \* \* \*

■ 17. Amend § 25.134 by removing paragraph (g), redesignating paragraph (h) as paragraph (g), revising the section heading and paragraphs (a) and (b), and adding paragraph (c) to read as follows:

**§ 25.134 Licensing provisions for 4/6 GHz, 12/14 GHz, and 20/30 GHz VSAT networks.**

(a) A license application for operation of a VSAT network in the 4/6 GHz bands may be routinely processed if frequency coordination has been satisfactorily completed pursuant to § 25.203 and the criteria in paragraph (a)(1) or (2) of this section are met:

(1)(i) Equivalent antenna diameter is 4.5 meters or more, and the applicant certifies pursuant to § 25.132(a)(1) that the off-axis gain of transmitting antennas in the network will not exceed

the relevant levels specified in § 25.209(a) and (b);

(ii) The input power of any full-transponder analog video transmission will not exceed the relevant limit in Section 25.211(d), and the bandwidth and input power density of any other type of analog transmission will not exceed the relevant limits in § 25.212(d);

(iii) The power density of any digitally modulated carrier will not exceed  $-2.7 - 10\log(N)$  dBW/4 kHz at the input of any network antenna. "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation.

(2) The application is not subject to an exclusion in § 25.218(a)(1) or (2) and includes tables filed pursuant to § 25.115(g)(1) indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in § 25.218.

(b) Applications for VSAT operation in the 12/14 GHz bands may be routinely processed if the criteria in the following paragraph (1) or (2) are met.

(1) (i) Equivalent antenna diameter is 1.2 meters or more, and the applicant certifies pursuant to § 25.132(a)(1) that the off-axis gain of transmitting antennas in the network will not exceed the relevant levels specified in § 25.209(a) and (b);

(ii) The input power of any full-transponder analog video transmission will not exceed the relevant limit in § 25.211(d), and the bandwidth and input power density of any other type of analog transmission will not exceed the relevant limits in § 25.212(c);

(iii) The power spectral density of any digitally modulated carrier into any transmitting earth station antenna in the proposed network will not exceed  $-14.0 - 10\log(N)$  dBW/4 kHz. N is the number of network earth stations that transmitting simultaneously in the same frequencies to the same target satellite, not counting packet burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation.

(2) The application is not subject to an exclusion in § 25.218(a)(1) or (2) and includes tables filed pursuant to § 25.115(g)(1) indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in § 25.218.

(c) Applications for VSAT stations that will transmit digitally modulated signals to GSO space stations in the 28.35–28.6 GHz and/or 29.25–30.0 GHz band may be routinely processed if the criteria in the following paragraph (1) or (2) are met:

(1) (i) Equivalent antenna diameter is at least 0.66 meters and the applicant certifies pursuant to § 25.132(a)(1) that the off-axis gain of transmitting antennas in the network will not exceed the relevant levels specified in § 25.209(a) and (b);

(ii) The power spectral density of any digitally modulated carrier into any transmitting earth station antenna in the proposed network will not exceed  $3.5 - 10\log(N)$  dBW/MHz. "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation.

(2) The application includes tables filed pursuant to § 25.115(g)(1) indicating that off-axis EIRP density from the proposed earth stations will not exceed relevant routine levels specified in § 25.138.

\* \* \* \* \*

■ 18. Amend § 25.138 by removing and reserving paragraphs (c) through (e); removing paragraph (g); and revising the section heading, paragraph (a) introductory text, paragraphs (a)(1) through (5), and paragraph (b) to read as follows:

**§ 25.138 Licensing requirements for GSO FSS Earth Stations in the 20/30 GHz bands.**

(a) Applications for earth station licenses in the GSO FSS in the 20/30 GHz bands that indicate that the following requirements will be met and include the information required by relevant provisions in §§ 25.115 and 25.130 may be routinely processed:

(1) The EIRP spectral density of co-polarized signals in the plane tangent to the GSO arc, as defined in § 25.103, will not exceed the following values under clear sky conditions:

32.5-25log( $\theta$ )-10log(N) .....	dBW/MHz	for $2.0^\circ \leq \theta \leq 7^\circ$ .
11.35-10log(N) .....	dBW/MHz	for $7^\circ \leq \theta \leq 9.23^\circ$ .
35.5-25log( $\theta$ )-10log(N) .....	dBW/MHz	for $9.23^\circ \leq \theta \leq 48^\circ$ .
3.5-10log(N) .....	dBW/MHz	for $48^\circ < \theta \leq 180^\circ$ .

Where  $\theta$  is the angle in degrees from a line from the earth station antenna to the assigned location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the maximum number of network earth

stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in

networks that permit such simultaneous co-frequency transmission only in contention protocol operation.

(2) In the plane perpendicular to the GSO arc, as defined in § 25.103, the EIRP density of co-polarized signals will not exceed the following values under clear sky conditions:

35.5-25log( $\theta$ )-10log(N) .....	dBW/MHz	for $3.5^\circ \leq \theta \leq 7^\circ$ .
14.35-10log(N) .....	dBW/MHz	for $7^\circ < \theta \leq 9.23^\circ$ .
38.5-25log( $\theta$ )-10log(N) .....	dBW/MHz	for $9.23^\circ < \theta \leq 48^\circ$ .
6.5-10log(N) .....	dBW/MHz	for $48^\circ < \theta \leq 180^\circ$ .

Where:  $\theta$  and N are as defined in paragraph (a)(1) of this section.

(3) The EIRP density levels specified in paragraphs (a)(1) and (2) of this section may be exceeded by up to 3 dB, for values of  $\theta > 10^\circ$ , over 10% of the

range of theta ( $\theta$ ) angles from 10–180° on each side of the line from the earth station to the target satellite.

(4) The EIRP density of cross-polarized signals will not exceed the following values in the plane tangent to

the GSO arc or in the plane perpendicular to the GSO arc under clear sky conditions:

22.5-25log( $\theta$ )-10log(N) .....	dBW/MHz	for $2.0^\circ < \theta \leq 7.0^\circ$ .
1.35-10log(N) .....	dBW/MHz	for $7.0^\circ < \theta \leq 9.23^\circ$ .

Where  $\theta$  and N are as defined in paragraph (a)(1) of this section.

(5) A license application for a network using variable power-density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:

(i) EIRP density from each station in the network will not exceed a level 1 dB below the levels specified in paragraphs (a)(1), (a)(2), and (a)(4) of this section, with the value of N=1.

(ii) Aggregate EIRP density toward any co-frequency space station other than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will not exceed the limit specified in paragraph (a)(5)(i) of this section.

\* \* \* \* \*

(b) Operation with off-axis EIRP density exceeding a relevant envelope specified in paragraph (a) of this section and applications proposing such operation are subject to coordination requirements in § 25.220.

\* \* \* \* \*

■ 19. Amend § 25.140 by revising paragraphs (a) and (b)(3) to read as follows:

#### § 25.140 Further requirements for license applications for geostationary space stations in the Fixed-Satellite Service and the 17/24 GHz Broadcasting-Satellite Service.

(a)(1) In addition to the information required by § 25.114, an applicant for GSO FSS space station operation involving transmission of analog video signals must certify that the proposed analog video operation has been coordinated with operators of authorized co-frequency space stations within 6 degrees of the requested orbit location.

(2) In addition to the information required by § 25.114, an applicant for a GSO FSS space station at an orbital location less than 2 degrees from the assigned location of an authorized co-frequency GSO space station must either certify that the proposed operation has been coordinated with the operator of the co-frequency space station or submit an interference analysis demonstrating the compatibility of the proposed system with the co-frequency space station. Such analysis must include, for each type of radio frequency carrier, the link noise budget, modulation parameters, and overall link performance analysis. (See Appendices B and C to Licensing of Space Stations in the Domestic Fixed-Satellite Service, FCC 83-184, and the following public notices, copies of which are available in

the Commission's EDOCS database: DA 03-3863 and DA 04-1708.) The provisions in this paragraph do not apply to proposed analog video operation, which is subject to the requirement in paragraph (a)(1).

(3) In addition to the information required by § 25.114, applicants for GSO FSS space stations must provide the following for operation other than analog video operation:

(i) With respect to proposed operation in the conventional or extended C-band, certification that downlink EIRP density will not exceed 1 dBW/4kHz for digital transmissions or 8 dBW/4kHz for analog transmissions and that EIRP density from associated uplink operation will not exceed applicable envelopes in §§ 25.218 or 25.221(a) unless the non-conforming uplink and/or downlink operation is coordinated with operators of authorized co-frequency space stations at assigned locations within 6 degrees of the orbital location of the proposed space station.

(ii) With respect to proposed operation in the conventional or extended Ku-band, certification that downlink EIRP density will not exceed 10 dBW/4kHz for digital transmission or 17 dBW/4kHz for analog transmission and that associated uplink operation will not exceed applicable EIRP density envelopes in §§ 25.218, 25.222, 25.226, or 25.227 unless the non-conforming

uplink and/or downlink operation is coordinated with operators of authorized co-frequency space stations at assigned locations within 6 degrees of the orbital location of the proposed space station.

(iii) With respect to proposed operation in the 20/30 GHz band, certification that the proposed space stations will not generate power flux-density at the Earth's surface in excess of  $-118$  dBW/m<sup>2</sup>/MHz and that associated uplink operation will not exceed applicable EIRP density envelopes in § 25.138(a) unless the non-conforming uplink and/or downlink operation is coordinated with operators of authorized co-frequency space stations at assigned locations within 6 degrees of the orbital location of the proposed space station.

(iv) With respect to proposed operation in other FSS bands, an interference analysis demonstrating compatibility with any previously authorized co-frequency space station at a location two degrees away or certification that the proposed operation has been coordinated with the operator(s) of the previously authorized space station(s). If there is no previously authorized space station at a location two degrees away, the applicant must submit an interference analysis demonstrating compatibility with a hypothetical co-frequency space station two degrees away with the same receiving and transmitting characteristics as the proposed space station.

(b) \* \* \*

(3) Except as described in paragraph (b)(5) of this section, an applicant for a license to operate a 17/24 GHz BSS space station that will be located precisely at one of the 17/24 GHz BSS orbital locations specified in Appendix F of the Report and Order adopted May 2, 2007, IB Docket No. 06-123, FCC 07-76, must provide an interference analysis demonstrating the compatibility of its proposed network with any current or future authorized space station in the 17/24 GHz BSS that complies with the technical rules in this part and will be located at least 4 degrees from the proposed space station.

#### § 25.142 [Amended].

- 20. Amend § 25.142 by removing paragraph (a)(5).
- 21. Amend § 25.143 by removing paragraph (c), redesignating paragraph (f) as paragraph (c), redesignating paragraph (h) as paragraph (d), and revising paragraph (a) to read as follows:

#### § 25.143 Licensing provisions for the 1.6/2.4 GHz Mobile-Satellite Service and 2 GHz Mobile-Satellite Service.

(a) Authority to launch and operate a constellation of NGSO satellites will be awarded in a single blanket license for operation of a specified number of space stations in specified orbital planes. An individual license will be issued for each GSO satellite, whether it is to be operated in a GSO-only system or in a GSO/NGSO hybrid system.

\* \* \* \* \*

- 22. Amend § 25.145 by removing and reserving paragraph (f), removing paragraph (h), and revising the section heading and paragraph (e) to read as follows:

#### § 25.145 Licensing provisions for the Fixed-Satellite Service in the 18.3–20.2 GHz and 28.35–30.0 GHz bands.

\* \* \* \* \*

(e) *Prohibition of certain agreements.* No license shall be granted to any applicant for a space station in the Fixed-Satellite Service operating in portions of the 18.3–20.2 GHz and 28.35–30.0 GHz bands if that applicant, or any persons or companies controlling or controlled by the applicant, shall acquire or enjoy any right, for the purpose of handling traffic to or from the United States, its territories or possessions, to construct or operate space segment or earth stations, or to interchange traffic, which is denied to any other United States company by reason of any concession, contract, understanding, or working arrangement to which the Licensee or any persons or companies controlling or controlled by the Licensee are parties.

- 23. Amend § 25.146 by removing paragraph (m) and revising the second sentence in paragraph (a)(1) to read as follows:

#### § 25.146 Licensing and operating rules for the non-geostationary orbit Fixed-Satellite Service in the 10.7 GHz-14.5 GHz bands.

(a) \* \* \*

(1) \* \* \* The PFD masks shall be generated in accordance with the specification stipulated in the most recent version of ITU-R Recommendation S.1503, "Functional description to be used in developing software tools for determining conformity of non-geostationary satellite orbit fixed-satellite system networks with limits contained in Article 22 of the Radio Regulations." \* \* \*

\* \* \* \* \*

#### § 25.147 [Removed and Reserved].

- 24. Remove and reserve § 25.147.
- 25. Amend § 25.151 by revising the section heading and paragraphs (a)(1),

(a)(7) and (a)(8) and adding paragraphs (a)(9) and (10) to read as follows:

#### § 25.151 Public notice.

(a) \* \* \*

(1) The receipt of applications for new station authorizations, except applications for space station authorizations filed pursuant to § 25.110(b)(3)(i);

\* \* \* \* \*

(7) Information which the Commission in its discretion believes to be of public significance;

(8) Special environmental considerations as required by part 1 of this chapter; and

(9) Submission of APIs and Coordination Requests to the ITU in response to requests filed pursuant to § 25.110(b)(3)(i).

(10) Receipt of information filed pursuant to § 25.110(b)(3)(ii).

\* \* \* \* \*

#### § 25.152 [Removed and Reserved].

- 26. Remove and reserve § 25.152.

- 27. Amend § 25.155 by removing from paragraph (a) the word "electrical" and revising paragraphs (b) and (c) to read as follows:

#### § 25.155 Mutually exclusive applications.

\* \* \* \* \*

(b) A license application for NGSO-like satellite operation, as defined in § 25.157, will be entitled to comparative consideration with one or more mutually exclusive applications only if the application is received by the Commission in a condition acceptable for filing by the "cut-off" date specified in a public notice.

(c) A license application for GSO-like satellite operation, as defined in § 25.158, will be entitled to comparative consideration with another application only if:

(1) The application is mutually exclusive with another GSO-like space station application; and

(2) The application is received by the Commission in a condition acceptable for filing at the same millisecond as the other application.

- 28. Amend § 25.156 by removing and reserving paragraph (b) and revising paragraphs (d)(1) through (5) to read as follows:

#### § 25.156 Consideration of applications.

\* \* \* \* \*

(d)(1) Applications for NGSO-like satellite operation will be considered pursuant to the procedures set forth in § 25.157, except as provided in § 25.157(b).

(2) Applications for GSO-like satellite operation will be considered pursuant

to the procedures set forth in § 25.158, except as provided in § 25.158(a)(2).

(3) Applications for both NGSO-like satellite operation and GSO-like satellite operation in two or more service bands will be treated as separate applications for each service band, and each service band request will be considered pursuant to §§ 25.157 or 25.158, as appropriate.

(4) Applications for feeder link authority or intersatellite link authority will be treated like an application separate from its associated service band. Each feeder link request or intersatellite link request will be considered pursuant to the procedure for applications for GSO-like operation or NGSO-like operation, as applicable.

(5) In cases where the Commission has not adopted frequency-band specific service rules, the Commission will not consider applications for NGSO-like satellite operation after it has granted an application for GSO-like operation in the same frequency band, and it will not consider applications for GSO-like operation after it has granted an application for NGSO-like operation in the same band, unless and until the Commission establishes NGSO/GSO sharing criteria for that frequency band. In the event that the Commission receives applications for NGSO-like operation and applications for GSO-like operation at the same time, and the Commission has not adopted sharing criteria in that band, the Commission will divide the spectrum between GSO-like and NGSO-like licensees based on the proportion of qualified GSO-like and NGSO-like applicants.

\* \* \* \* \*

■ 29. Amend § 25.157 by revising the section heading, paragraphs (a) and (b), paragraph (c) introductory text, paragraph (g)(1), and the last sentence in paragraph (g)(2) to read as follows:

**§ 25.157 Consideration of applications for NGSO-like satellite operation.**

(a) This section specifies the procedures for considering license applications for “NGSO-like” satellite operation, except as provided in paragraph (b) of this section. For purposes of this section, the term “NGSO-like satellite operation” is defined as:

(1) Operation of any NGSO satellite system, and

(2) Operation of a GSO MSS satellite to communicate with earth stations with non-directional antennas.

(b) The procedures prescribed in this section do not apply to an application by the licensed operator of an NGSO constellation or GSO MSS space station for authority to launch and operate a

replacement satellite, or satellites, with the same operating frequencies as the satellite(s) to be replaced and (if the replacement satellite is GSO) at an orbital location within  $\pm 0.15$  degrees of the assigned location of the satellite to be replaced and which will be launched before the satellite(s) to be replaced are, or is, retired from service or within a reasonable time after loss of a satellite during launch or due to premature failure in orbit.

(c) Each application for NGSO-like satellite operation that is acceptable for filing under § 25.112, except replacement applications described in paragraph (b) of this section, will be reviewed to determine whether it is a “competing application,” *i.e.*, filed in response to a public notice initiating a processing round, or a “lead application,” *i.e.*, all other applications for NGSO-like satellite operation.

\* \* \* \* \*

(g)(1) In the event that a license granted in a processing round pursuant to this section is cancelled for any reason, the Commission will redistribute the bandwidth allocated to that applicant equally among the remaining applicants whose licenses were granted concurrently with the cancelled license, unless the Commission determines that such a redistribution would not result in a sufficient number of licensees remaining to make reasonably efficient use of the frequency band.

(2) \* \* \* Parties already holding licenses for NGSO-like satellite operation in that frequency band will not be permitted to participate in that processing round.

\* \* \* \* \*

■ 30. Amend § 25.158 by revising the section heading, paragraph (a), paragraph (b) introductory text, paragraphs (b)(2) and (c), and paragraph (d) introductory text to read as follows:

**§ 25.158 Consideration of applications for GSO-like satellite systems.**

(a)(1) Except as provided in paragraph (a)(2) of this section, this section specifies the Commission’s procedures for considering license applications for “GSO-like” satellite operation. For purposes of this section, the term “GSO-like satellite system” means a GSO satellite designed to communicate with earth stations with directional antennas, including operation of GSO satellites to provide MSS feeder links.

(2) The procedures prescribed in this section do not apply to an application for authority to launch and operate a replacement satellite with the same operating frequencies and at the same orbital location as a space station

currently licensed to the applicant, to be launched before the satellite to be replaced is retired from service or within a reasonable time after loss of the satellite to be replaced due to launch failure or premature failure in orbit.

(b) Except as provided in paragraph (a)(2) of this section, license applications for GSO-like satellite systems, including first-step filings pursuant to § 25.110(b)(3)(i), will be placed in a queue and considered in the order that they are filed, pursuant to the following procedure:

\* \* \* \* \*

(2) If the application is acceptable for filing, the application will be placed on public notice pursuant to § 25.151.

(i) For applications filed pursuant to § 25.110(b)(3)(i), the public notice will announce that the API and Coordination Request has been submitted to the ITU. When further information is filed pursuant to § 25.110(b)(3)(ii), it will be reviewed to determine whether it is substantially complete within the meaning of § 25.112. If so, a second public notice will be issued pursuant to § 25.151 to give interested parties an opportunity to file pleadings pursuant to § 25.154.

(ii) For any other license application for a GSO-like satellite system, the public notice will announce that the application has been found acceptable for filing and will give interested parties an opportunity to file pleadings pursuant to § 25.154.

(c) An applicant for a license for a GSO-like satellite system is not allowed to transfer, assign, or otherwise permit any other entity to assume its place in any queue.

(d) In the event that two or more applications for GSO-like satellite systems are mutually exclusive within the meaning of § 25.155(c), the Commission will consider those applications pursuant to the following procedure:

\* \* \* \* \*

■ 31. Amend § 25.163 by revising paragraph (a)(3) to read as follows:

**§ 25.163 Reinstatement.**

(a) \* \* \*

(3) The petition sets forth with specificity the procedures that have been established to ensure timely filings in the future.

\* \* \* \* \*

■ 32. Amend § 25.165 by revising the section heading, paragraphs (a)(1) through (4), and paragraphs (c) and (e), and adding paragraphs (f) and (g) to read as follows:

**§ 25.165 Surety bonds.**

(a) \* \* \*

(1) An NGSO licensee must file a surety bond requiring payment, in the event of a default as defined paragraph (c) of this section, in an amount to be determined by adjusting a baseline amount of \$[x] million for inflation in accordance with paragraph (a)(4) of this section, with the resulting dollar amount rounded to the nearest \$10,000.

(2) A GSO licensee must file a surety bond requiring payment, in the event of a default as defined paragraph (c) of this section, in an amount to be determined by adjusting a baseline amount of \$[y] million for inflation in accordance with paragraph (a)(4) of this section, with the resulting dollar amount rounded to the nearest \$10,000.

(3) Licensees of satellite systems including both NGSO satellites and GSO satellites that will operate in the same frequency bands must file a bond requiring payment, in the event of a default as defined paragraph (c) of this section, in an amount to be determined by adjusting a baseline amount of \$[x] million for inflation in accordance with paragraph (a)(4) of this section, with the resulting dollar amount rounded to the nearest \$10,000.

(4) Inflation adjustment for purposes of paragraphs (a)(1) through (3) and paragraph (f) of this section shall be computed by multiplying the baseline dollar amount by the Bureau of Economic Analysis “GDPChain-type Price Index” (GDP-CPI) for the most recent quarter and dividing the product by the GDP-CDI for [year and quarter when inflation-adjustment rule is adopted].

\* \* \* \* \*

(c) A licensee will be considered to be in default if it surrenders the license before meeting all milestone requirements or if it fails to meet any milestone deadline set forth in § 25.164, and, at the time of milestone deadline, the licensee has not provided a sufficient basis for extending the milestone.

\* \* \* \* \*

(e) A replacement satellite is one that: (1) Is authorized to be operated at an orbital location within 0.15 degrees of the assigned location of a GSO satellite licensed to the same party or is authorized for NGSO operation and will replace an existing NGSO satellite licensed to the same party;

(2) Is authorized to operate in the same frequency bands, and with the same coverage area as the satellite to be replaced; and

(3) Is scheduled to be launched so that it will be brought into use at approximately the same time as, but no later than, the existing satellite is retired.

(f) An applicant that has filed an API and Coordination Request pursuant to § 25.110(b)(3)(i) must obtain a surety bond in accordance with the requirements in paragraph (b) of this section. The bond must require payment, in the event of a default as defined in paragraph (g) of this section, of an amount to be determined by adjusting a baseline amount of \$[y]<sup>5</sup> million in accordance with paragraph (a)(4) of this section, with the resulting dollar amount rounded to the nearest \$10,000. The application will be returned as defective pursuant to § 25.112 if a copy of the required bond is not filed with the Commission within 30 days after release of a public notice announcing that the Commission has filed the API and Coordination Request with the ITU.

(g) An applicant or licensee will be deemed to be in default with respect to a bond filed pursuant to paragraph (f) of this section under any of the following circumstances:

(1) If the applicant fails to file complete Form 312 and Schedule S information pursuant to § 25.110(b)(3)(ii) within two years after the issuance of the public notice announcing the submission of the API and Coordination Request to the ITU.

(2) If the license application filed pursuant to § 25.110(b)(3) is dismissed and is not refiled prior to the two-year deadline in § 25.110(b)(3)(ii) or the application is denied and the ruling is administratively final.

(3) If a license granted for a space station proposed in the application filed pursuant to § 25.110(b)(3) is surrendered before the authorized space station is launched.

(4) If a license granted for the space station proposed in the application filed pursuant to § 25.110(b)(3) is declared null and void for failure to meet a milestone requirement in § 25.164 and the milestone ruling is administratively final.

■ 33. Amend § 25.202 by revising the table in paragraph (a)(1) and paragraph (g) to read as follows:

#### § 25.202 Frequencies, frequency tolerance, and emission limits.

(a)(1) \* \* \*

Space-to-earth (GHz)	Earth-to-space (GHz)
3.6–3.65 .....	<sup>8</sup> 5.091–5.25
3.65–3.7 .....	5.85–5.925
3.7–4.2 .....	5.925–6.425
4.5–4.8 .....	6.425–6.525

<sup>5</sup> The value of y<sub>1</sub> would be two fifths of the baseline amount specified in paragraph (a)(2) for a post-grant bond for a GSO licensee.

Space-to-earth (GHz)	Earth-to-space (GHz)
6.7–7.025 <sup>8</sup> .....	6.525–6.7
7.025–7.075 .....	6.7–7.025
10.7–11.7 <sup>8</sup> .....	7.025–7.075
11.7–12.2 .....	12.7–12.75
12.2–12.7 .....	12.75–13.25
18.3–18.58 <sup>1,2</sup> .....	13.75–14
18.58–18.8 .....	14–14.2
18.8–19.3 .....	14.2–14.5
19.3–19.7 .....	<sup>8</sup> 15.43–15.63
19.7–20.2 .....	17.3–17.8
37.5–40 <sup>3</sup> .....	24.75–25.05
40–42 .....	25.05–25.25
	<sup>2</sup> 27.5–28.35
	<sup>4</sup> 28.35–28.6
	<sup>5</sup> 28.6–29.1
	<sup>6</sup> 29.1–29.25
	<sup>7</sup> 29.25–29.5
	<sup>4</sup> 29.5–30.0
	47.2–50.2

<sup>1</sup> The 18.3–18.58 GHz band is shared equally with existing terrestrial radiocommunication systems until November 19, 2012.

<sup>2</sup> FSS is secondary to LMDS in this band.

<sup>3</sup> Use of this band by the Fixed-Satellite Service is limited to gateway earth station operations, provided the licensee under this Part obtains a license under part 101 of this chapter or an agreement from a part 101 licensee for the area in which an earth station is to be located. Satellite earth station facilities in this band may not be ubiquitously deployed and may not be used to serve individual consumers.

<sup>4</sup> This band is primary for GSO FSS and secondary for NGSO FSS.

<sup>5</sup> This band is primary for NGSO FSS and secondary for GSO FSS.

<sup>6</sup> This band is primary for MSS feeder links and LMDS hub-to-subscriber transmission.

<sup>7</sup> This band is primary for MSS feeder links and GSO FSS.

<sup>8</sup> Use of this band by NGSO FSS systems is limited to transmissions to or from gateway earth stations.

\* \* \* \* \*

(g)(1) Except as provided in paragraph (g)(2) below, telemetry, tracking, and command signals must be transmitted at either or both edges of the allocated band(s).

(2) Additional, non-emergency telemetry, tracking, and command signals may be transmitted in frequencies within the assigned bands that are not at a band edge if such transmissions cause no more interference and require no greater protection from harmful interference than the communications traffic on the satellite network.

(3) Frequencies, polarization, and coding of telemetry, tracking, and command transmissions must be selected to minimize interference into other satellite networks.

■ 34. Amend § 25.203 by adding paragraph (c)(6), revising the first sentence in paragraph (f), and revising paragraphs (g)(1) and (j) to read as follows:

**§ 25.203 Choice of sites and frequencies.**

\* \* \* \*

(c) \*

(6) Multiple antennas in an NGSO FSS gateway earth station complex located within an area bounded by one second of latitude and one second of longitude may be regarded as a single earth station for purposes of coordination with terrestrial services.

\* \* \* \*

(f) *Notification to the National Radio Astronomy Observatory:* In order to minimize possible harmful interference at the National Radio Astronomy Observatory site at Green Bank, Pocahontas County, W. Va., and at the Naval Radio Research Observatory site at Sugar Grove, Pendleton County, W. Va., any applicant for operating authority under this part for a new transmit or transmit-receive earth station, other than a mobile or temporary fixed station, within the area bounded by 39°15' N. on the north, 78°30' W. on the east, 37°30' N. on the south and 80°30' W. on the west or for modification of an existing license for such station to change the station's frequency, power, antenna height or directivity, or location must, when filing the application with the Commission, simultaneously notify the Director, National Radio Astronomy Observatory, P.O. Box No. 2, Green Bank, W. Va. 24944, in writing, of the technical particulars of the proposed station. \*

(g) \*

(1) Applicants for authority to operate a new transmitting earth station in the vicinity of an FCC monitoring station or to modify the operation of a transmitting

earth station in a way that would increase the field strength produced at such a monitoring station above that previously authorized should consider the possible need to protect the FCC stations from harmful interference. Geographic coordinates of the facilities that require protection are listed in § 0.121(c) of the Commission's Rules. Applications for fixed stations that will produce field strength greater than 10 mV/m or power flux density greater than  $-65.8 \text{ dBW/m}^2$  in the authorized emission bandwidth at any of the referenced coordinates may be examined to determine the extent of possible interference. Depending on the theoretical field strength value and existing root-sum-square or other ambient radio field signal levels at the referenced coordinates, a condition to protect the monitoring station may be included in the station authorization.

\* \* \* \*

(j) Applicants for non-geostationary 1.6/2.4 GHz Mobile-Satellite Service/Radiodetermination-Satellite Service feeder links in the 17.7–20.2 GHz and 27.5–30.0 GHz bands must coordinate with licensees of Fixed-Satellite Service and terrestrial-service systems sharing the band to determine geographic protection areas around each non-geostationary Mobile-Satellite Service/Radiodetermination-Satellite Service feeder-link earth station.

\* \* \* \*

**§ 25.204 [Amended].**

- 35. Amend § 25.204 by removing the last sentence from paragraph (e)(1).
- 36. Revise § 25.205 to read as follows:

29-25 $\log_{10}\theta$ .....	dBi	for $1.5^\circ \leq \theta \leq 7^\circ$ .
8 .....	dBi	for $7^\circ < \theta \leq 9.2^\circ$ .
32-25 $\log_{10}\theta$ .....	dBi	for $9.2^\circ < \theta \leq 48^\circ$ .
-10 .....	dBi	for $48^\circ < \theta \leq 180^\circ$ .

Where  $\theta$  is the angle in degrees from a line from the focal point of the antenna to the target satellite, and dB<sub>i</sub> refers to dB relative to an isotropic radiator. This

envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ – $180^\circ$ .

29-25 $\log_{10}\theta$ .....	dBi	for $1.5^\circ \leq \theta \leq 7^\circ$ .
8 .....	dBi	for $7^\circ < \theta \leq 9.2^\circ$ .
32-25 $\log_{10}\theta$ .....	dBi	for $9.2^\circ < \theta \leq 48^\circ$ .
-10 .....	dBi	for $48^\circ < \theta \leq 85^\circ$ .
0 .....	dBi	for $85^\circ < \theta \leq 180^\circ$ .

Where  $\theta$  and dB<sub>i</sub> are as defined in paragraph (a)(1) above. This envelope

may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ – $180^\circ$ .

29-25 $\log_{10}\theta$ .....	dBi	for $2^\circ \leq \theta \leq 7^\circ$ .
8 .....	dBi	for $7^\circ < \theta \leq 9.2^\circ$ .

**§ 25.205 Minimum antenna elevation angle.**

(a) Earth station antennas may not transmit at elevation angles less than 5 degrees, measured from the horizontal plane to the direction of maximum radiation, in a frequency band shared with terrestrial radio services or at elevation angles less than 3 degrees in other frequency bands. In some instances, it may be necessary to specify greater minimum elevation angles because of interference considerations.

(b) ESAs in aircraft on the ground may not transmit at elevation angles less than 3 degrees. There is no minimum angle of antenna elevation for ESAs while airborne.

- 37. Amend § 25.209 by revising paragraphs (a) through (c), removing and reserving paragraph (e), removing from paragraph (f) the word "procedures" wherever it appears and adding in its place the word "requirements," and revising paragraph (h) to read as follows:

**§ 25.209 Earth station antenna performance standards.**

(a) Except as provided in paragraph (f) of this section, the gain of any earth station antenna operating in the Fixed-Satellite Service, including earth stations providing feeder links for satellite services other than FSS, may not exceed the following limits:

- (1) In the plane tangent to the GSO arc, as defined in § 25.103, for earth stations not operating in the conventional Ku-band, the 28.35–30 GHz band, or the 24.75–25.25 GHz band:

29-25 $\log_{10}\theta$ .....	dBi	for $1.5^\circ \leq \theta \leq 7^\circ$ .
8 .....	dBi	for $7^\circ < \theta \leq 9.2^\circ$ .
32-25 $\log_{10}\theta$ .....	dBi	for $9.2^\circ < \theta \leq 48^\circ$ .
-10 .....	dBi	for $48^\circ < \theta \leq 85^\circ$ .
0 .....	dBi	for $85^\circ < \theta \leq 180^\circ$ .

(2) In the plane tangent to the GSO arc, for earth stations operating in the conventional Ku-band:

29-25 $\log_{10}\theta$ .....	dBi	for $1.5^\circ \leq \theta \leq 7^\circ$ .
8 .....	dBi	for $7^\circ < \theta \leq 9.2^\circ$ .
32-25 $\log_{10}\theta$ .....	dBi	for $9.2^\circ < \theta \leq 48^\circ$ .
-10 .....	dBi	for $48^\circ < \theta \leq 85^\circ$ .
0 .....	dBi	for $85^\circ < \theta \leq 180^\circ$ .

(3) In the plane tangent to the GSO arc, for earth stations operating in the 28.35–30 GHz or 24.75–25.25 GHz band:

29-25 $\log_{10}\theta$ .....	dBi	for $2^\circ \leq \theta \leq 7^\circ$ .
8 .....	dBi	for $7^\circ < \theta \leq 9.2^\circ$ .

32-25log <sub>10</sub> θ .....	dBi	for 9.2°<θ≤48°.
0 .....	dBi	for 48°<θ≤180°.

Where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of θ angles from ±7–180°.

(4) In the plane perpendicular to the GSO arc, as defined in § 25.103, for earth stations not operating in the conventional Ku-band, 28.35–30 GHz band, or 24.75–25.25 GHz band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

32-25log <sub>10</sub> θ .....	dBi	for 3°<θ≤48°.
-10 .....	dBi	for 48°<θ≤180°.
0 .....		

Where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of θ angles from ±3–180°.

(5) In the plane perpendicular to the GSO arc, for earth stations operating in the conventional Ku-band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

32-25log <sub>10</sub> θ .....	dBi	for 3°<θ≤48°.
-10 .....	dBi	for 48°<θ≤85°.
0 .....	dBi	for 85°<θ≤180°.

Where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of θ angles from ±3–180°.

(6) In the plane perpendicular to the GSO arc, for earth stations operating in the 28.35–30 GHz band or 24.75–25.25 GHz band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

32-25log <sub>10</sub> θ .....	dBi	for 3.5°<θ≤7°.
10.9 .....	dBi	for 7°<θ≤9.2°.
35-25log <sub>10</sub> θ .....	dBi	for 9.2°<θ≤48°.
3 .....	dBi	for 48°<θ≤180°.

Where θ and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of θ angles from ±3–180°.

(b) Except as provided in paragraph (f) of this section, the off-axis cross-

polarization gain of any antenna used for transmission from an FSS earth station, including earth stations providing feeder links for satellite services other than FSS, may not exceed the following limits:

(1) In the plane tangent to the GSO arc, for earth stations not operating in the 28.35–30 GHz band or the 24.75–25.25 GHz band:

19-25log <sub>10</sub> θ .....	dBi	for 1.8°<θ≤7°.
-2 .....	dBi	for 7°<θ≤9.2°.

Where θ and dBi are as defined in paragraph (a)(1) above.

(2) In the plane perpendicular to the GSO arc, for earth stations not operating

in the 28.35–30 GHz band or the 24.75–25.25 GHz band:

19-25log <sub>10</sub> θ .....	dBi	for 3°<θ≤7°.
-2 .....	dBi	for 7°<θ≤9.2°.

Where θ and dBi are as defined in paragraph (a)(1) above.

(3) In the plane perpendicular to the GSO arc, for earth stations operating in

the 28.35–30 GHz band or 24.75–25.25 GHz band:

19-25log <sub>10</sub> θ .....	dBi	for 2°<θ≤7°.
-2 .....	dBi	for 7°<θ≤9.2°.

Where θ and dBi are as defined in paragraph (a)(1) above.

(c)(1) An earth station licensed for operation with an FSS space station or registered for reception of transmissions from such a space station pursuant to § 25.131(b) and (d) is not entitled to

protection from interference from authorized operation of other stations that would not cause harmful interference to that earth station if it were using an antenna with receive-band gain patterns conforming to the levels specified in § 25.209(a) and (b).

(2) A 17/24 GHz BSS telemetry earth station is not entitled to protection from harmful interference from authorized space station operation that would not cause harmful interference to that earth station if it were using an antenna with receive-band gain patterns conforming

to the levels specified in paragraphs (a) and (b) of this section. Receive-only earth stations in the 17/24 GHz BSS are entitled to protection from harmful interference caused by other space

stations to the extent indicated in § 25.224.

\* \* \* \* \*

(h) The gain of any transmitting antenna in a gateway earth station

communicating with NGSO FSS satellites in the 10.7–11.7 GHz, 12.75–13.15 GHz, 13.2125–13.25 GHz, 13.8–14.0 GHz, and/or 14.4–14.5 GHz bands must lie below the envelope defined as follows:

29-25log <sub>10</sub> (θ) .....	dBi	for 1°≤θ≤36°.
-10 .....	dBi	for 36°≤θ≤180°.

Where θ and dB<sub>i</sub> are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of θ angles from ±7–180°.

■ 38. Amend § 25.210 by removing and reserving paragraph (a) and revising paragraph (i) to read as follows:

**§ 25.210 Technical requirements for space stations.**

\* \* \* \* \*

(i) Space station antennas in the 17/24 GHz Broadcasting Satellite Service must be designed to provide a cross-polarization isolation such that the ratio of the on axis co-polar gain to the cross-polar gain of the antenna in the assigned frequency band shall be at least 25 dB within its primary coverage area.

\* \* \* \* \*

■ 39. Amend § 25.211 by removing and reserving paragraph (a) and revising paragraphs (b) and (e) to read as follows:

**§ 25.211 Analog video transmissions in the Fixed-Satellite Service.**

\* \* \* \* \*

(b) All 4/6 GHz analog video transmissions shall contain an energy dispersal signal at all times with a minimum peak-to-peak bandwidth set at whatever value is necessary to meet the power flux density limits specified in § 25.208(a) and successfully coordinated internationally and accepted by adjacent U.S. satellite operators based on the use of state of the art space and earth station facilities. All transmissions in frequency bands described in § 25.208(b) and (c) shall also contain an energy dispersal signal at all times with a minimum peak-to-peak bandwidth set at whatever value is necessary to meet the power flux density limits specified in § 25.208(b) and (c) and successfully coordinated internationally and accepted by adjacent U.S. satellite operators based on the use of state of the art space and earth station facilities.

\* \* \* \* \*

(e) Applications for authority for analog video uplink transmission in the 5925–6425 MHz or 14.0–14.5 GHz band that are not eligible for routine

processing under paragraph (d) of this section are subject to the requirements of § 25.220.

■ 40. Amend § 25.212 by revising paragraph (c)(1) and paragraphs (d) and (e), and adding paragraph (g) to read as follows:

**§ 25.212 Narrowband analog transmissions and digital transmissions in the GSO Fixed Satellite Service.**

\* \* \* \* \*

(c)(1) An earth station that is not subject to licensing under §§ 25.134, 25.222, 25.226, or § 25.227 may be routinely licensed for analog transmissions in the 14.0–14.5 GHz band with bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if the equivalent diameter of the transmitting antenna is 1.2 meters or greater, input power spectral density into the antenna will not exceed  $-8 - 10\log_{10}(N)$  dBW/4 kHz, and the applicant certifies conformance with relevant antenna performance standards in § 25.209(a) and (b). “N” is the number of earth stations transmitting simultaneously in the same frequencies to the same target satellite. For stations not transmitting simultaneously on common frequencies to the same target satellite, N=1.

\* \* \* \* \*

(d) An individual earth station that is not subject to licensing under § 25.221 may be routinely licensed for digital transmission in the 5925–6425 MHz band or analog transmission in that band with carrier bandwidths up to 200 kHz (or up to 1 MHz for command carriers at the band edge) if the equivalent diameter of the transmit antenna is 4.5 meters or greater, the applicant certifies conformance with relevant antenna performance standards in § 25.209(a) and (b), and power density into the antenna will not exceed  $+0.5 - 10\log_{10}(N)$  dBW/4 kHz for analog carriers or  $-2.7 - 10\log_{10}(N)$  dBW/4 kHz for digital carriers, where “N” is as defined in paragraph (c)(1) of this section.

(e) Applications for authority for fixed earth station operation in the 5925–6425 GHz or 14.0–14.5 GHz band that do not qualify for routine processing under relevant criteria in this section, §§ 25.211, or 25.218 are subject to the requirements in § 25.220.

\* \* \* \* \*

(g) An earth station not subject to network licensing under § 25.134 may be routinely licensed for digital transmission in the 28.35–28.6 GHz and/or 29.25–30.0 GHz bands if the equivalent diameter of the transmitting antenna is 66 centimeters or greater, input power spectral density into the antenna will not exceed 3.5 dBW/MHz, and the application includes certification pursuant to § 25.132(a)(1) of conformance with the antenna gain performance requirements in § 25.209(a) and (b).

■ 41. Revise § 25.218 to read as follows:

**§ 25.218 Off-axis EIRP density envelopes for FSS earth stations transmitting in certain frequency bands.**

(a) This section applies to applications for Fixed-Satellite Service earth stations transmitting to geostationary-orbit space stations in the conventional C-band, extended C-band, conventional Ku-band, or extended Ku band, including VSAT applications not meeting routine licensing criteria in § 25.134, with the following exceptions:

(1) ESV, VMES, and ESAA applications and

(2) Applications proposing transmission of analog command signals at a band edge with bandwidths greater than 1 MHz or transmission of any other type of analog signal with bandwidths greater than 200 kHz.

(b) Earth station applications subject to this section may be routinely processed if they meet the applicable off-axis EIRP density envelopes set forth in this section below and include the table required by § 25.115(h).

(c) *Analog earth station operation in the conventional or extended C-band.*

(1) In the plane tangent to the GSO arc, as defined in § 25.103:

29.5-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 1.5°≤θ≤7°
8.5-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°

32.5-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 9.2°<θ≤48°
-9.5-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°

Where  $\theta$  is the angle in degrees from a line from the earth station antenna to the assigned location of the target satellite and "N" is the number of network earth stations transmitting

simultaneously in the same frequencies to the same target satellite. The EIRP density levels specified for  $\theta>7^\circ$  may be exceeded by up to 3 dB in up to 10%

of the range of theta ( $\theta$ ) angles from  $\pm 7-180^\circ$ .

(2) In the plane perpendicular to the GSO arc, as defined in § 25.103:

32.5-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 3°≤θ≤48°
-9.5-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°

Where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover

energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(d) *Digital earth station operation in the conventional or extended C-band.*

(1) In the plane tangent to the GSO arc:

26.3-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 1.5°≤θ≤7°
5.3-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°
29.3-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 9.2°<θ≤48°
-12.7-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°

Where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is defined below. The EIRP density levels specified for  $\theta>7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7-180^\circ$ . For stations in networks that allow multiple terminals to transmit simultaneously in shared

frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with

others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation.

(2) In the plane perpendicular to the GSO arc:

29.3-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 3°≤θ≤48°
-12.7-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°

Where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) A license application for a network using variable power-density control of

earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:

(i) Off-axis EIRP density from each station in the network will be kept at least 1 dB below the levels specified in paragraphs (d)(1) and (2) of this section, with the value of N=1.

(ii) Aggregate EIRP density toward any co-frequency space station other

than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will not exceed the limit specified in paragraph (d)(3)(i) above.

(e) *Analog earth station operation in the conventional Ku-band.* (1) In the plane tangent to the GSO arc:

21-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 1.5°≤θ≤7°
0-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°
24-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 9.2°<θ≤48°
-18-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤85°
-8-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 85°<θ≤180°

Where  $\theta$  is as defined in paragraph (c)(1) of this section. The EIRP density levels specified for  $\theta>7^\circ$  may be exceeded by

up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7-180^\circ$ .

(2) In the plane perpendicular to the GSO arc:

24-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 3°≤θ≤48°
-18-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤85°
-8-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 85°<θ≤180°

Where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover

energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(f) *Digital earth station operation in the conventional Ku-band.* (1) In the plane tangent to the GSO arc:

15-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 1.5°≤θ≤7°.
-6-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°.
18-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 9.2°<θ≤48°.
-24-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤85°.
-14-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 85°<θ≤180°.

Where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. The EIRP density levels specified for  $\theta>7^\circ$

may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ –180°.

(2) In the plane perpendicular to the GSO arc:

18-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 3°≤θ≤48°.
-24-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤85°.
-14-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 85°<θ≤180°.

Where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) A license application for a network using variable power-density control of

earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:

(i) Off-axis EIRP density from each station in the network will be kept at least 1 dB below the levels specified in paragraphs (f)(1) and f)(2) of this section, with the value of N=1.

(ii) Aggregate EIRP density toward any co-frequency space station other

than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will not exceed the limit specified in paragraph (f)(3)(i) of this section.

(g) *Analog earth station operation in the extended Ku-band.* (1) In the plane tangent to the GSO arc:

21-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 1.5°≤θ≤7°.
0-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°.
24-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 9.2°<θ≤48°.
-18-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°.

Where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$

may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ –180°.

(2) In the plane perpendicular to the GSO arc:

24-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 3°≤θ≤48°.
-18-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°.

Where  $\theta$  is as defined in paragraph (c)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover

energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(h) *Digital earth station operation in the extended Ku-band.* (1) In the plane tangent to the GSO arc:

15-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 1.5°≤θ≤7°.
-6-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°.
18-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 9.2°<θ≤48°.
-24-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤180°.

Where  $\theta$  is as defined in paragraph (c)(1) of this section, and N is as defined in paragraph (d)(1) of this section. The EIRP density levels specified for  $\theta > 7^\circ$

may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ –180°.

(2) In the plane perpendicular to the GSO arc:

18-10log <sub>10</sub> (N)-25log <sub>10</sub> $\theta$ .....	dBW/4 kHz	for 3°≤θ≤48°.
-24-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤85°.

Where  $\theta$  is as defined in paragraph (c)(1) of this section and  $N$  is as defined in paragraph (d)(1) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(3) A license application for a network using variable power-density control of earth stations transmitting simultaneously in shared frequencies to the same target satellite may be routinely processed if the applicant demonstrates the following:

(i) Off-axis EIRP density from each station in the network will be kept at least 1 dB below the levels specified in paragraphs (h)(1) and (2) of this section, with the value of  $N=1$ .

(ii) Aggregate EIRP density toward any co-frequency space station other than the target satellite not resulting from colliding data bursts transmitted pursuant to a contention protocol will be kept at least 1 dB below the levels specified in paragraphs (h)(1) and (2) of this section, with the value of  $N=1$ .

■ 42. Amend § 25.220 by revising paragraphs (a) and (b), removing and reserving paragraph (d)(1)(i), and

26.3-10log(N)-25log $\theta$ .....	
5.3-10log(N) .....	
29.3-10log(N)-25log $\theta$ .....	
-12.7-10log(N) .....	

Where theta ( $\theta$ ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in

revising paragraph (d)(2) to read as follows:

**§ 25.220 Non-conforming transmit/receive earth station operations.**

(a) The requirements in this section apply to applications for, and operation of, earth stations transmitting in the conventional or extended C-band, the conventional or extended Ku-band, or the 20/30 GHz bands that do not qualify for routine licensing under relevant criteria in §§ 25.134, 25.138, 25.211, 25.212, 25.218, 25.221(a)(1) or (3), 25.222(a)(1) or (3), 25.226(a)(1) or (3), or § 25.227(a)(1) or (3).

(b) Applications filed pursuant to this section must include the information required by § 25.115(g)(1).

\* \* \* \* \*

(d) \* \* \*

(2) The operator of an earth station licensed pursuant to this section must reduce EIRP density toward a subsequently launched two-degree-compliant space station receiving in the same uplink band at a position within 6 degrees of the earth station's target satellite if the non-conforming earth station operation has not been coordinated with the operator of the new satellite. The earth station operator must reduce EIRP density to levels at or within relevant routine limits toward a

two-degree-compliant space station receiving in the same uplink band at a position more than 6 degrees away from the target satellite if operation of the co-frequency space station is adversely affected by the non-conforming earth station operation, unless the non-conforming operation is permitted under a coordination agreement with the operator of the co-frequency satellite.

\* \* \* \* \*

■ 43. Amend § 25.221 by revising paragraphs (a)(1)(i)(A) through (D), paragraphs (a)(2) and (3), the introductory text of paragraphs (b) and (b)(1), removing and reserving paragraphs (b)(1)(i) and (ii), and revising paragraphs (b)(2) and (3) to read as follows:

**§ 25.221 Blanket Licensing provisions for Earth Stations on Vessels (ESVs) receiving in the 3700–4200 MHz (space-to-Earth) band and transmitting in the 5925–6425 MHz (Earth-to-space) band, operating with GSO Satellites in the Fixed-Satellite Service.**

(a) * * *
(1) * * *
(i) * * *

(A) Off-axis EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in § 25.103, shall not exceed the following values:

dBW/4 kHz .....	for $1.5^\circ \leq \theta \leq 7^\circ$ .
dBW/4 kHz .....	for $7^\circ < \theta \leq 9.2^\circ$ .
dBW/4 kHz .....	for $9.2^\circ < \theta \leq 48^\circ$ .
dBW/4 kHz .....	for $48^\circ < \theta \leq 180^\circ$ .

29.3-10log(N)-25log $\theta$ .....	
-12.7-10log(N) .....	

the same frequencies to the same target satellite, not counting burst collisions resulting from operation with a contention protocol.  $N=1$  for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in

contention protocol operation. The EIRP density levels specified for  $\theta > 7^\circ$  may be exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7^\circ$  to  $180^\circ$ .

(B) In the plane perpendicular to the GSO arc, as defined in § 25.103, EIRP spectral density of co-polarized signals shall not exceed the following values:

dBW/4 kHz .....	for $3.0^\circ \leq \theta \leq 48^\circ$ .
dBW/4 kHz .....	for $48^\circ < \theta \leq 180^\circ$ .

29.3-10log(N)-25log $\theta$ .....	
-12.7-10log(N) .....	

Where  $\theta$  and  $N$  are as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in

up to 10% of the range of  $\theta$  angles not included in that region, on each side of the line from the earth station to the target satellite.

(C) The off-axis EIRP spectral-density of cross-polarized signals shall not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

dBW/4 kHz .....	for $1.8^\circ \leq \theta \leq 7.0^\circ$ .
dBW/4 kHz .....	for $7.0^\circ < \theta \leq 9.2^\circ$ .

16.3-10log(N)-25log $\theta$ .....	
-4.7-10log(N) .....	

Where  $\theta$  and  $N$  are as defined in paragraph (a)(1)(i)(A) of this section.

(D) For non-circular ESV antennas, the major axis of the antenna must be aligned with the plane tangent to the

GSO arc to the extent required to meet

the specified off-axis EIRP spectral-density criteria.

\* \* \* \* \*

(2) The following requirements apply to ESV systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) An ESV or ESV system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any ESV transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual ESV transmitters must monitor the aggregate off-axis EIRP density from simultaneously-transmitting ESV transmitters at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP-density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to an ESV system that uses variable power control of individual earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the ESV system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from terminals in the network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits defined in paragraph (a)(1)(i) of this section, with the value of N=1.

(ii) Each ESV transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) Aggregate power density from simultaneously-transmitting ESV transmitters must be monitored at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for ESV operation in the 5925–6425 MHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, applicable technical demonstrations or certifications pursuant to paragraph (b)(1), (b)(2), or (b)(3) of this section and the documentation identified in paragraphs (b)(4) through (b)(6) of this section.

(1) An ESV applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by § 25.115(g)(1). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An applicant proposing to operate with off-axis EIRP density in excess of the levels specified in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) Off-axis EIRP density data pursuant to § 25.115(g)(1);

(ii) The certifications required by § 25.220(d);

(iii) A detailed showing that each ESV transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator;

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting ESV transmitters will be monitored at the system's network control and

monitoring center; that if simultaneous operation of two or more ESV transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command; and

(v) A certification that the ESV system will operate in compliance with the power limits in § 25.204(h).

(3) An applicant proposing to implement an ESV system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

(i) Off-axis EIRP density data pursuant to § 25.115(g)(1);

(ii) A detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;

(iii) A detailed showing that each ESV terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section;

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command; and

(v) Certification that the ESV system will operate in compliance with the power limits in § 25.204(h).

\* \* \* \* \*

■ 44. Amend § 25.222 by revising paragraphs (a)(1)(i)(A) through (D), paragraphs (a)(2) and (3), the introductory text of paragraphs (b) and (b)(1), removing and reserving paragraphs (b)(1)(i) and (ii), and revising paragraphs (b)(2) and (3) to read as follows:

**§ 25.222 Blanket Licensing provisions for Earth Stations on Vessels (ESVs) receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), 11.7–12.2 GHz (space-to-Earth) bands and transmitting in the 14.0–14.5 GHz (Earth-to-space) band, operating with GSO Satellites in the Fixed-Satellite Service.**

(a) \* \* \*

15-10log(N)-25logθ .....	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$ .
-6-10log(N) .....	dBW/4 kHz	for $7^\circ < \theta \leq 9.2^\circ$ .
18-10log(N)-25logθ .....	dBW/4 kHz	for $9.2^\circ < \theta \leq 48^\circ$ .
-24-10log(N) .....	dBW/4 kHz	for $48^\circ < \theta \leq 85^\circ$ .
-14-10log(N) .....	dBW/4 kHz	for $85^\circ < \theta \leq 180^\circ$ .

Where theta (θ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target

(1) \* \* \*

(i) \* \* \*

(A) Off-axis EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in § 25.103, shall not exceed the following values:

15-10log(N)-25logθ .....	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$ .
-6-10log(N) .....	dBW/4 kHz	for $7^\circ < \theta \leq 9.2^\circ$ .
18-10log(N)-25logθ .....	dBW/4 kHz	for $9.2^\circ < \theta \leq 48^\circ$ .
-24-10log(N) .....	dBW/4 kHz	for $48^\circ < \theta \leq 85^\circ$ .
-14-10log(N) .....	dBW/4 kHz	for $85^\circ < \theta \leq 180^\circ$ .

satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for  $\theta > 7^\circ$  may

be exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from  $\pm 7^\circ$ – $180^\circ$ .

(B) The off-axis EIRP density of co-polarized signals shall not exceed the following values in the plane perpendicular to the GSO arc, as defined in § 25.103:

Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in

up to 10% of the range of θ angles not included in that region, on each side of the line from the earth station to the target satellite.

(C) The off-axis EIRP density of cross-polarized signals shall not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

5-10log(N)-25logθ .....	dBW/4 kHz	for $3.0^\circ \leq \theta \leq 48^\circ$ .
-16-10log(N) .....	dBW/4 kHz	for $48^\circ < \theta \leq 85^\circ$ .
.....	dBW/4 kHz	for $85^\circ < \theta \leq 180^\circ$ .

Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section.

(D) For non-circular ESV antennas, the major axis of the antenna must be aligned with the plane tangent to the GSO arc to the extent required to meet the specified off-axis EIRP density criteria.

\* \* \* \* \*

(2) The following requirements apply to ESV systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) An ESV or ESV system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any ESV transmitter operating under a license granted based on

certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual ESV transmitters must monitor the aggregate off-axis EIRP density from simultaneously-transmitting ESV transmitters at the system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP-density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must

comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to an ESV system that uses variable power control of individual earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the ESV system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from terminals in the network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits defined in paragraph (a)(1)(i) of this section, with the value of N = 1.

(ii) Each ESV transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) Aggregate power density from simultaneously-transmitting ESV transmitters must be monitored at the

system's network control and monitoring center. If simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for ESV operation in the 14.0–14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, applicable technical demonstrations or certifications pursuant to paragraph (b)(1), (b)(2), or (b)(3) of this section and the documentation identified in paragraphs (b)(4) through (6) of this section.

(1) An ESV applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by § 25.115(g)(1). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An ESV applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

32.5-25log(θ) .....	dBW/MHz	for $2^\circ \leq \theta \leq 7^\circ$ .
11.4 .....	dBW/MHz	for $7^\circ \leq \theta \leq 9.2^\circ$ .
35.5-25log(θ) .....	dBW/MHz	for $9.2^\circ \leq \theta \leq 48^\circ$ .
3.5 .....	dBW/MHz	for $48^\circ \leq \theta \leq 180^\circ$ .

Where  $\theta$  is the angle in degrees from a line from the earth station antenna to

(2) An applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

- (i) Off-axis EIRP density data pursuant to § 25.115(g)(1);
- (ii) The certifications required by § 25.220(d);
- (iii) A detailed showing that each ESV transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and
- (iv) A detailed showing that the aggregate power density from simultaneously transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command.

(3) An applicant proposing to implement an ESV system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

- (i) Off-axis EIRP density data pursuant to § 25.115(g)(1);
- (ii) A detailed showing of the measures that will be employed to maintain aggregate EIRP density at or

below the limit in paragraph (a)(3)(i) of this section;

(iii) A detailed showing that each ESV terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting ESV transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESV transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

■ 45. Amend § 25.223 by revising paragraphs (b), (c), and (d) to read as follows:

**§ 25.223 Alternative licensing rules for feeder-link earth stations in the 17/24 GHz BSS.**

\* \* \* \* \*

(b) Applications for earth station licenses in the 24.75–25.25 GHz portion of 17/24 GHz BSS may be routinely processed if they meet the following requirements:

(1) The EIRP density of co-polarized signals shall not exceed the following values in the plane tangent to the GSO arc, as defined in § 25.103, under clear sky conditions:

35.5-25log(θ) .....	dBW/MHz	for $2^\circ \leq \theta \leq 7^\circ$ .
14.4 .....	dBW/MHz	for $7^\circ \leq \theta \leq 9.2^\circ$ .
38.5-25log(θ) .....	dBW/MHz	for $9.2^\circ \leq \theta \leq 48^\circ$ .
6.5 .....	dBW/MHz	for $48^\circ \leq \theta \leq 180^\circ$ .

the assigned orbital location of the target satellite.

(2) The EIRP density of co-polarized signals shall not exceed the following

values under clear sky conditions in the plane perpendicular to the GSO arc, as defined in § 25.103:

35.5-25log(θ) .....	dBW/MHz	for $2^\circ \leq \theta \leq 7^\circ$ .
14.4 .....	dBW/MHz	for $7^\circ \leq \theta \leq 9.2^\circ$ .
38.5-25log(θ) .....	dBW/MHz	for $9.2^\circ \leq \theta \leq 48^\circ$ .
6.5 .....	dBW/MHz	for $48^\circ \leq \theta \leq 180^\circ$ .

Where  $\theta$  is as defined in paragraph (b)(1) of this section.

(3) The EIRP density levels specified in paragraphs (a)(1) and (2) of this section may be exceeded by up to 3 dB

for values of  $\theta > 10^\circ$ , in 10% of the range of theta ( $\theta$ ) angles from  $10^\circ$ – $180^\circ$  on each side of the line from the earth station to the target satellite.

(4) The EIRP density of cross-polarized signals shall not exceed the following values in the plane tangent to the GSO arc or in the plane

perpendicular to the GSO arc, under clear sky conditions:

22.5-25log( $\theta$ ) .....	dBW/MHz	for $2^\circ \leq \theta \leq 7^\circ$ .
1.4 .....	dBW/MHz	for $7^\circ \leq \theta \leq 9.2^\circ$ .

Where  $\theta$  is as defined in paragraph (b)(1) of this section.

(c) An applicant proposing levels in excess of those specified in paragraph (b) of this section must certify that potentially affected parties acknowledge and do not object to the use of the applicant's higher EIRP densities.

(1) For proposed non-conforming EIRP density levels up to 3 dB in excess of the limits defined in paragraph (b) of this section, potentially affected parties are operators of co-frequency U.S.-authorized 17/24 GHz BSS space stations at angular separations of up to  $\pm 6^\circ$  from the proposed satellite points of communication. For proposed EIRP density levels more than 3 dB but not more than 6 dB in excess of the limits defined in paragraph (b) of this section, potentially affected parties are operators of co-frequency U.S.-authorized space stations up to  $\pm 10^\circ$  from the proposed satellite points of communication.

(2) Notwithstanding paragraph (c)(1) of this section, an applicant need not certify that the operator of a co-frequency space station consents to proposed non-conforming operation if EIRP density from the proposed earth station will not exceed the levels specified in paragraph (b) toward any position in the geostationary arc within

1 degree of the assigned orbital location of the co-frequency space station.

(3) Power density levels more than 6 dB in excess of the limits defined in paragraph (b) of this section will not be permitted.

(d)(1) The operator of an earth station licensed pursuant to paragraph (c) of this section shall bear the burden of coordinating with the operator of a co-frequency space station subsequently licensed by the Commission for operation at an orbital location 10 degrees or less from the earth station's target satellite if the co-frequency space station's reception of conforming uplink transmissions is, or would be, adversely affected by the earth station's non-conforming operation. If no agreement is reached, the earth station operator must reduce EIRP density toward that co-frequency space station to a level in conformance with the envelopes specified in paragraph (b) of this section.

(2) The operator of an earth station licensed pursuant to paragraph (c)(1) or (c)(2) of this section must reduce EIRP density to levels at or within those specified in paragraph (b) toward a U.S.-licensed space station receiving in the same uplink band at a position more than 6 or 10 degrees away from the earth

station's target satellite if the co-frequency space station's reception of conforming uplink transmissions is adversely affected by the non-conforming earth station operation, unless the non-conforming operation is permitted under a coordination agreement with the operator of the co-frequency space station.

\* \* \* \*

■ 46. Amend § 25.226 by revising paragraphs (a)(1)(i)(A) through (D), paragraphs (a)(2) and (3), paragraphs (b) and (b)(1) introductory text, removing and reserving paragraphs (b)(1)(i) and (ii), and revising paragraphs (b)(2) and (b)(3) to read as follows:

**§ 25.226 Blanket Licensing provisions for domestic, U.S. Vehicle-Mounted Earth Stations (VMESs) receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), and 11.7–12.2 GHz (space-to-Earth) bands and transmitting in the 14.0–14.5 GHz (Earth-to-space) band, operating with Geostationary Satellites in the Fixed-Satellite Service.**

(a) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) Off-axis EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in § 25.103, shall not exceed the following values:

15-10log( $N$ )-25log $\theta$ .....	dBW/4 kHz	for $1.5^\circ \leq \theta \leq 7^\circ$ .
-6-10log( $N$ ) .....	dBW/4 kHz	for $7^\circ < \theta \leq 9.2^\circ$ .
18-10log( $N$ )-25log $\theta$ .....	dBW/4 kHz	for $9.2^\circ < \theta \leq 48^\circ$ .
-24-10log( $N$ ) .....	dBW/4 kHz	for $48^\circ < \theta \leq 85^\circ$ .
-14-10log( $N$ ) .....	dBW/4 kHz	for $85^\circ < \theta \leq 180^\circ$ .

Where theta ( $\theta$ ) is the angle in degrees from a line from the earth station antenna to the assigned orbital location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target

satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for  $\theta > 7^\circ$  may be

exceeded by up to 3 dB in up to 10% of the range of theta ( $\theta$ ) angles from  $\pm 7$ – $180^\circ$ .

(B) The off-axis EIRP spectral density of co-polarized signals shall not exceed the following values in the plane perpendicular to the GSO arc, as defined in § 25.103:

18-10log( $N$ )-25log $\theta$ .....	dBW/4 kHz	for $3.0^\circ \leq \theta \leq 48^\circ$ .
-24-10log( $N$ ) .....	dBW/4 kHz	for $48^\circ < \theta \leq 85^\circ$ .
-14-10log( $N$ ) .....	dBW/4 kHz	for $85^\circ < \theta \leq 180^\circ$ .

Where  $\theta$  and N are as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be

exceeded by up to 6 dB in the region of main reflector spillover energy and in up to 10% of the range of  $\theta$  angles not

included in that region, on each side of the line from the earth station to the target satellite.

(C) The EIRP density of cross-polarized signals shall not exceed the following values in the plane tangent to

the GSO arc or in the plane perpendicular to the GSO arc:

5-10log(N)-25logθ .....	dBW/4 kHz	for $1.8^\circ \leq \theta \leq 7.0^\circ$ .
-16-10log(N) .....	dBW/4 kHz	for $7.0^\circ < \theta \leq 9.2^\circ$ .

Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section.

(D) For non-circular VMES antennas, the major axis of the antenna must be aligned with the plane tangent to the GSO arc to the extent required to meet the specified off-axis EIRP spectral density criteria.

\* \* \* \* \*

(2) The following requirements apply to VMES systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) A VMES or VMES system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

(ii) Any VMES transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.

(iii) A system with variable power control of individual VMES transmitters must monitor the aggregate off-axis EIRP density from simultaneously-transmitting VMES transmitters at the system's network control and monitoring center. If simultaneous operation of two or more VMES transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to a VMES system that uses variable power control of individual VMES earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the system operates

pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from terminals in the network toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits defined in paragraph (a)(1)(i) of this section, with the value of N=1.

(ii) Each VMES transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) Aggregate power density from simultaneously-transmitting VMES transmitters must be monitored at the system's network control and monitoring center. If simultaneous operation of two or more transmitters in a VMES network causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for VMES operation in the 14.0–14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service must include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, applicable technical demonstrations pursuant to paragraph (b)(1), (b)(2), or (b)(3) of this section and the documentation identified in paragraphs (b)(4) through (b)(8) of this section.

(1) A VMES applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by § 25.115(g)(1). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the

demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) Off-axis EIRP density data pursuant to § 25.115(g)(1);

(ii) The certifications required by § 25.220(d);

(iii) A detailed showing that each VMES transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting VMES transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more VMES transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command.

(3) An applicant proposing to implement a VMES system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

(i) Off-axis EIRP density data pursuant to § 25.115(g)(1);

(ii) A detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;

(iii) A detailed showing that each VMES terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting ESV transmitters will be monitored at the

system's network control and monitoring center; that if simultaneous operation of two or more transmitters in the VMES network causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

15-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 1.5°≤θ≤7°.
-6-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°.
18-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 9.2°<θ≤48°.
-24-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 48°<θ≤85°.
-14-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 85°<θ≤180°.

Where theta (θ) is the angle in degrees from a line from the earth station's antenna to the assigned orbital location of the target satellite. For stations in networks that allow multiple terminals to transmit simultaneously in shared frequencies with equal on-axis EIRP, "N" is the number of network earth stations transmitting simultaneously in the same frequencies to the same target

■ 47. Amend § 25.227 by revising paragraphs (a)(1)(i)(A) through (C), paragraphs (a)(2) and (3), paragraphs (b) and (b)(1) introductory text, removing and reserving paragraphs (b)(1)(i) and (ii), and revising paragraphs (b)(2) and (3) to read as follows:

\* \* \* \* \*

**§ 25.227 Blanket licensing provisions for Earth Stations Aboard Aircraft (ESAA) receiving in the 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), and 11.7–12.2 GHz (space-to-Earth) frequency bands and transmitting in the 14.0–14.5 GHz (Earth-to-space) frequency band, operating with Geostationary Satellites in the Fixed-Satellite Service.**

(a) \* \* \*

(1) \* \* \*

(i) \* \* \*

(A) EIRP spectral density emitted in the plane tangent to the GSO arc, as defined in § 25.103, must not exceed the following values:

18-10log(N)-25logθ .....	dBW/4 kHz	for 3.0°≤θ≤48°.
-24-10log(N) .....	dBW/4 kHz	for 48°<θ≤85°.
-14-10log(N) .....	dBW/4 kHz	for 85°<θ≤180°.

Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section. These EIRP density levels may be exceeded by up to 6 dB in the region of main reflector spillover energy and in

satellite, not counting burst collisions resulting from operation with a contention protocol. N=1 for any station not transmitting simultaneously with others on common frequencies to the same target satellite and stations in networks that permit such simultaneous co-frequency transmission only in contention protocol operation. The EIRP density levels specified for θ>7° may be

exceeded by up to 3 dB in up to 10% of the range of theta (θ) angles from ±7–180°.

(B) The EIRP spectral density of co-polarized signals must not exceed the following values in the plane perpendicular to the GSO arc, as defined in § 25.103:

5-10log <sub>10</sub> (N)-25log <sub>10</sub> θ .....	dBW/4 kHz	for 1.8°<θ≤7°.
-16-10log <sub>10</sub> (N) .....	dBW/4 kHz	for 7°<θ≤9.2°.

Where θ and N are as defined in paragraph (a)(1)(i)(A) of this section.

\* \* \* \* \*

(2) The following requirements apply to ESAA systems that operate with off-axis EIRP spectral-densities in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section under licenses granted based on certifications filed pursuant to paragraph (b)(2) of this section.

(i) An ESAA or ESAA system licensed based on certifications filed pursuant to paragraph (b)(2) of this section must operate in accordance with the off-axis EIRP density specifications provided to the target satellite operator in order to obtain the certifications.

up to 10% of the range of θ angles not included in that region, on each side of the line from the earth station to the target satellite.

(C) The off-axis EIRP spectral-density of cross-polarized signals must not exceed the following values in the plane tangent to the GSO arc or in the plane perpendicular to the GSO arc:

(ii) Any ESAA transmitter operating under a license granted based on certifications filed pursuant to paragraph (b)(2) of this section must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP-density in excess of the specifications supplied to the target satellite operator.	dBW/4 kHz	for 1.8°<θ≤7°.
(iii) A system with variable power control of individual ESAA transmitters must monitor the aggregate off-axis EIRP density from simultaneously-transmitting ESAA transmitters at the system's network control and monitoring center. If simultaneous operation of two or more ESAA transmitters causes aggregate off-axis	dBW/4 kHz	for 7°<θ≤9.2°.

EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications, and the transmitters must comply within 100 milliseconds of receiving the command.

(3) The following requirements apply to an ESAA system that uses variable power-density control of individual ESAA earth stations transmitting simultaneously in the same frequencies to the same target satellite, unless the system operates pursuant to paragraph (a)(2) of this section.

(i) Aggregate EIRP density from ESAA terminals toward any co-frequency satellite other than the target satellite(s) must be at least 1 dB below the limits specified in paragraph (a)(1)(i) of this section, with the value of N=1.

(ii) Each ESAA transmitter must be self-monitoring and capable of shutting itself off and must cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density in excess of the limit in paragraph (a)(3)(i) of this section.

(iii) A system with variable power control of individual ESAA transmitters must monitor aggregate power density from simultaneously-transmitting ESAA transmitters at the network control and monitoring center. If simultaneous operation of two or more transmitters causes aggregate off-axis EIRP density to exceed the off-axis EIRP density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center must command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit, and those transmitters must comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

(b) Applications for ESAA operation in the 14.0–14.5 GHz (Earth-to-space) band to GSO satellites in the Fixed-Satellite Service shall include, in addition to the particulars of operation identified on Form 312, and associated Schedule B, the applicable technical demonstrations in paragraphs (b)(1), (b)(2), or (b)(3), and the documentation identified in paragraphs (b)(4) through (b)(8) of this section.

(1) An ESAA applicant proposing to implement a transmitter under paragraph (a)(1) of this section must provide the information required by § 25.115(g)(1). The applicant must also specify the value N defined in paragraph (a)(1)(i)(A) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(A) of this section must also provide the certifications identified in paragraph (b)(1)(iii) of this section. An applicant proposing to implement a transmitter under paragraph (a)(1)(ii)(B) of this section must also provide the demonstrations identified in paragraph (b)(1)(iv) of this section.

\* \* \* \* \*

(2) An ESAA applicant proposing to operate with off-axis EIRP density in excess of the levels in paragraph (a)(1)(i) or (a)(3)(i) of this section must provide the following in exhibits to its earth station application:

(i) Off-axis EIRP density data pursuant to § 25.115(g)(1);

(ii) The certifications required by § 25.220(d); and

(iii) A detailed showing that each ESAA transmitter in the system will automatically cease or reduce emissions within 100 milliseconds after generating EIRP density exceeding specifications provided to the target satellite operator; and

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting ESAA transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more ESAA transmitters causes the aggregate off-axis EIRP density to exceed the off-axis EIRP density specifications supplied to the target satellite operator, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below those specifications; and that those transmitters will comply within 100 milliseconds of receiving the command.

(3) An applicant proposing to implement an ESAA system subject to paragraph (a)(3) of this section must provide the following information in exhibits to its earth station application:

(i) Off-axis EIRP density data pursuant to § 25.115(g)(1);

(ii) A detailed showing of the measures that will be employed to maintain aggregate EIRP density at or below the limit in paragraph (a)(3)(i) of this section;

(iii) A detailed showing that each ESAA terminal will automatically cease or reduce emissions within 100 milliseconds after generating off-axis EIRP density exceeding the limit in paragraph (a)(3)(i) of this section; and

(iv) A detailed showing that the aggregate power density from simultaneously-transmitting ESAA transmitters will be monitored at the system's network control and monitoring center; that if simultaneous operation of two or more transmitters in the ESAA network causes aggregate off-axis EIRP density to exceed the off-axis density limit in paragraph (a)(3)(i) of this section, the network control and monitoring center will command those transmitters to cease emissions or reduce the aggregate EIRP density to a level at or below that limit; and that those transmitters will comply within 100 milliseconds of receiving the command.

\* \* \* \* \*

■ 48. Amend § 25.258 by revising the section heading and the first sentence in paragraph (b) to read as follows:

**§ 25.258 Sharing between NGSO MSS feeder link stations and GSO FSS services in the 29.25–29.5 GHz Band.**

\* \* \* \* \*

(b) Licensed GSO FSS earth stations in the vicinity of operational or planned NGSO MSS feeder link earth station complexes shall, to the maximum extent possible, operate with frequency/polarization selections that will minimize unacceptable interference with reception of GSO FSS and NGSO MSS uplink transmissions in the 29.25–29.5 GHz band. \* \* \*

■ 49. Amend § 25.264 by revising paragraph (a) introductory text and paragraph (a)(5), adding paragraph (a)(6), and revising paragraph (b) introductory text, the second sentence in paragraph (b)(1), paragraph (b)(2)(ii), the first sentence in paragraph (b)(3), the first sentence in paragraph (c), the first sentence in paragraph (d) introductory text, and the first two sentences in paragraph (d)(1)(ii) to read as follows:

**§ 25.264 Requirements to facilitate reverse-band operation in the 17.3–17.8 GHz band of 17/24 GHz Broadcasting-Satellite Service and Direct Broadcast Satellite Service space stations.**

(a) Each 17/24 GHz BSS space station applicant or licensee must submit a series of tables or graphs containing predicted off-axis gain data for each antenna that will transmit in the 17.3–17.8 GHz frequency band, in accordance with the following specifications. Using a Cartesian coordinate system wherein the X axis is tangent to the geostationary orbital arc with the positive direction pointing east, *i.e.*, in the direction of travel of the satellite; the Y axis is parallel to a line passing through the geographic north and south poles of the Earth, with the positive direction pointing south; and the Z axis passes through the satellite and the center of the Earth, with the positive direction pointing toward the Earth, the applicant or licensee must provide the predicted transmitting antenna off-axis antenna gain information: \* \* \*

\* \* \* \* \*

(5) Over a greater angular measurement range, if necessary, to account for any planned spacecraft orientation bias or change in operating orientation relative to the reference coordinate system. The applicant or licensee must state the reasons for including such additional information.

(6) The predictive gain information must be submitted to the Commission when a license application is filed for a 17/24 GHz BSS space station or within 60 days after completion of critical design review for the space station, whichever occurs later.

(b) A 17/24 GHz BSS space station applicant or licensee must submit power flux density (pfд) calculations based on the predicted gain data submitted in accordance with paragraph (a) of this section, as follows:

(1) \* \* \* In this section, the term prior-filed U.S. DBS space station refers to any co-frequency Direct Broadcast Satellite service space station for which an application was filed with the Commission, or an authorization was granted by the Commission, prior to the filing of the information and certifications required by paragraphs (a) and (b) of this section. \* \* \*

(2) \* \* \*

(ii) Indicate the extent to which the calculated pfд of the 17/24 GHz space station's transmissions in the 17.3–17.8 GHz band exceed the threshold pfд level of  $-117 \text{ dBW/m}^2/100 \text{ kHz}$  at those prior-filed U.S. DBS space station locations.

(3) If the calculated pfд exceeds the threshold level of  $-117 \text{ dBW/m}^2/100 \text{ kHz}$  at the location of any prior-filed U.S. DBS space station, the applicant or licensee must also provide with the pfд calculations a certification that all affected DBS operators acknowledge and do not object to such higher off-axis pfд levels. \* \* \*

(4) The information and any certification required by paragraph (b) of this section must be submitted to the Commission when a license application is filed for a 17/24 GHz BSS space station or within 60 days after completion of critical design review for the space station, whichever occurs later. Otherwise, such information and certifications must be submitted to the Commission within 24 months after the grant of an operating license for a 17/24 GHz BSS space station or when the applicant or licensee certifies completion of critical design review, whichever occurs first.

(c) No later than 2 months prior to launch, each 17/24 GHz BSS space station licensee must update the predicted transmitting antenna off-axis gain information provided in accordance with paragraph (a) of this section by submitting measured transmitting antenna off-axis gain information over the angular ranges, measurement frequencies and polarizations specified in paragraphs (a)(1) through (5) of this section. \* \* \*

(d) No later than 2 months prior to launch, or when applying for authority to change the location of a 17/24 GHz BSS space station that is already in orbit, each 17/24 GHz BSS space station licensee must provide pfд calculations based on the measured off-axis gain data

submitted in accordance with paragraph (c) of this section, as follows:

(1) \* \* \*

(ii) At the location of any subsequently-filed U.S. DBS space station where the pfд level in the 17.3–17.8 GHz band calculated on the basis of measured gain data exceeds  $-117 \text{ dBW/m}^2/100 \text{ kHz}$ . In this rule, the term subsequently-filed U.S. DBS space station refers to any co-frequency Direct Broadcast Satellite service space station proposed in a license application filed with the Commission after the 17/24 GHz BSS operator submitted the predicted data required by paragraphs (a) through (b) of this section but before submission of the measured data required by this paragraph. \* \* \*

■ 50. Amend § 25.275 by adding paragraph (e) to read as follows:

**§ 25.275 Particulars of operation.**

\* \* \* \* \*

(e) Transmission from an earth station of an unmodulated carrier at a power level sufficient to saturate a satellite transponder is prohibited, except by the space station licensee to determine transponder performance characteristics.

■ 51. Add § 25.288 to read as follows:

**§ 25.288 Obligation to remedy interference caused by NGSO MSS feeder downlinks in the 6700–6875 MHz band.**

If an NGSO MSS satellite transmitting in the band 6700–6875 MHz causes harmful interference to previously licensed co-frequency Public Safety facilities, the satellite licensee has an obligation to remedy the interference.

**Alternative Proposed Revision of Milestone and Bond Rules**

*Alternative 1*

■ 1. Amend § 25.164 by revising paragraphs (a) and (b), removing and reserving paragraph (c), and revising paragraph (d) to read as follows:

**§ 25.164 Milestones.**

(a) Licensees of geostationary orbit satellite systems, other than DBS and DARS satellite systems, licensed on or after August 27, 2003 will be required to comply with the schedule set forth in paragraphs (a)(1) and (2) of this section in implementing their satellite systems, unless a different schedule is established by Title 47, Chapter I, or by Commission Order, or by Order adopted pursuant to delegated authority. These dates are to be measured from the date the license is issued.

(1) *Two years:* Complete the critical design review of the licensed satellite system.

(2) *Five years:* Launch the space station, position it in its assigned orbital location, and operate it in accordance with the station authorization.

(b) Licensees of non-geostationary orbit satellite systems other than DBS and DARS satellite systems licensed on or after September 11, 2003, will be required to comply with the schedule set forth in paragraphs (b)(1) through (b)(5) of this section in implementing their satellite systems, unless a different schedule is established by Title 47, Chapter I, or by Commission Order, or by Order adopted pursuant to delegated authority. These dates are to be measured from the date the license is issued.

(1) *Two years:* Complete the critical design review of the licensed satellite system.

(2) *Three years, six months:* Launch the first space station, place it in the authorized orbit, and operate it in accordance with the station authorization.

(3) *Six years:* Bring all the satellites in the licensed satellite system into operation.

\* \* \* \* \*

(d) No later than 15 days after the milestone deadline for CDR, the recipient of an initial license for operation of a space station, or space stations, other than DBS or SDARS space stations, must either certify that CDR has been completed for the authorized satellite(s) or notify the Commission in writing that CDR has not been completed. A licensee that certifies completion of CDR must also file a corroborating affidavit from the satellite manufacturer and evidence of appropriate payment to date.

\* \* \* \* \*

*Alternative 2*

■ 2. Amend § 25.164 by revising paragraphs (a) and (b), removing and reserving paragraphs (c) through (e), and revising paragraphs (f) and (g) to read as follows:

**§ 25.164 Milestones.**

(a) The recipient of an initial license for a GSO space station, other than DBS or SDARS space stations, granted on or after August 27, 2003 must launch the space station, position it in its assigned orbital location, and operate it in accordance with the station authorization no later than five years after the grant of the license, unless a different schedule is established by Title 47, Chapter I, or by order of the Commission or order adopted pursuant to delegated authority.

(b) The recipient of an initial license for an NGSO satellite system, other than

DBS or SDARS satellite systems, granted on or after September 11, 2003 must launch the authorized space stations, place them in the assigned orbits, and operate them in accordance with the station authorization no later than six years after the grant of the license, unless a different schedule is established by Title 47, Chapter I, or by order of the Commission or order adopted pursuant to delegated authority.

\* \* \* \* \*

(f) A licensee subject to the requirements in paragraph (a) or (b) of this section must either demonstrate compliance with the requirement specified therein or notify the Commission in writing that the requirement was not met, within 15 days after the specified deadline. Compliance with a milestone

requirement in paragraph (a) or (b) of this section may be demonstrated by certifying pursuant to § 25.121(d) that the space station(s) in question, has, or have, been launched and placed in the authorized orbital location or non-geostationary orbit(s) and that in-orbit operation of the space station or stations has been tested and found to be consistent with the terms of the authorization.

(g) Licensees of satellite systems that include both NGSO satellites and GSO satellites, other than DBS and DARS satellite systems, must meet the requirement in paragraph (a) of this section with respect to the GSO satellite(s) and the requirement in paragraph (b) of this section with respect to the NGSO satellites.

\* \* \* \* \*

■ 3. Amend § 25.165 by revising the section heading and paragraph (d) to read as follows:

#### **§ 25.165 Surety bonds.**

\* \* \* \* \*

(d)(1) In the event of a default as defined in paragraph (c) of this section, the amount determined pursuant to paragraph (a) of this section must be paid to the U.S. Treasury, with any additional amount determined pursuant to paragraph (f) of this section.

(2) If a licensee surrenders a license for cancellation prior to an applicable deadline in § 25.164(a) or (b), the surety shall pay the U.S. Treasury \$400,000 plus a pro rata amount to be determined according to this formula:  $A = B * D/T$ , where A is the pro rata amount to be paid; B is either zero or the amount determined pursuant to paragraph (a) of this section minus \$400,000, whichever is greater; D is the number of days that elapsed from the date of license grant

until the date when the license was surrendered, and T is the total number of days from the date of grant until the relevant deadline in § 25.164(a) or (b). If the license was for a hybrid system subject to paragraph (a)(3) of this section, T is the number of days between grant and the deadline determined in accordance with § 25.164(b).

(3) If paragraph (f) of this section is applicable and the license is surrendered for cancellation prior to an applicable deadline in § 25.164(a) or (b), the amount to be paid will be the sum of the amounts determined in accordance with paragraphs (d)(2) and (f) of this section.

\* \* \* \* \*

#### **Alternative Proposed Revision of Two Degree Spacing Rules**

■ 1. Amend § 25.140 by revising paragraphs (a) and (b)(3) to read as follows:

#### **§ 25.140 Further requirements for license applications for geostationary space stations in the Fixed-Satellite Service and the 17/24 GHz Broadcasting-Satellite Service.**

(a)(1) In addition to the information required by § 25.114, an applicant for GSO FSS space station operation involving transmission of analog video signals must certify that the proposed analog video operation has been coordinated with operators of authorized co-frequency space stations within 6 degrees of the requested orbit location.

(2) In addition to the information required by § 25.114, an applicant for a GSO FSS space station at an orbital location less than 2 degrees from the assigned location of an authorized co-frequency GSO space station must either certify that the proposed operation has been coordinated with the operator of the co-frequency space station or submit an interference analysis demonstrating the compatibility of the proposed system with the co-frequency space station. Such analysis must include, for each type of radio frequency carrier, the link noise budget, modulation parameters, and overall link performance analysis. (See Appendices B and C to Licensing of Space Stations in the Domestic Fixed-Satellite Service, FCC 83-184, and the following public notices, copies of which are available in the Commission's EDOCS database: DA 03-3863 and DA 04-1708.) The provisions in this paragraph do not apply to proposed analog video operation, which is subject to the requirement in paragraph (a)(1).

(3) In addition to the information required by § 25.114, applicants for GSO FSS space stations must provide the following for operation other than analog video operation:

(i) With respect to proposed operation in the conventional or extended C-band, certification that downlink EIRP density will not exceed 1 dBW/4kHz for digital transmissions or 8 dBW/4kHz for analog transmissions and that EIRP density from associated uplink operation will not exceed applicable envelopes in § 25.218 or § 25.221(a) unless the non-conforming uplink and/or downlink operation is coordinated with operators of previously authorized co-frequency space stations at assigned locations within 6 degrees of the orbital location of the proposed space station.

(ii) With respect to proposed operation in the conventional or extended Ku-band, certification that downlink EIRP density will not exceed 10 dBW/4kHz for digital transmission or 17 dBW/4kHz for analog transmission and that associated uplink operation will not exceed applicable EIRP density envelopes in §§ 25.218, 25.222, 25.226, or § 25.227 unless the non-conforming uplink and/or downlink operation is coordinated with operators of previously authorized co-frequency space stations at assigned locations within 6 degrees of the orbital location of the proposed space station.

(iii) With respect to proposed operation in the 20/30 GHz band, certification that the proposed space stations will not generate power flux-density at the Earth's surface in excess of  $-118$  dBW/m<sup>2</sup>/MHz and that associated uplink operation will not exceed applicable EIRP density envelopes in § 25.138(a) unless the non-conforming uplink and/or downlink operation is coordinated with operators of previously authorized co-frequency space stations at assigned locations within 6 degrees of the orbital location of the proposed space station.

(b) \* \* \*

(3) Except as described in paragraph (b)(5) of this section, an applicant for a license to operate a 17/24 GHz BSS space station that will be located precisely at one of the 17/24 GHz BSS orbital locations specified in Appendix F of the Report and Order adopted May 2, 2007, IB Docket No. 06-123, FCC 07-76, must provide an interference analysis demonstrating the compatibility of its proposed network with any current or future authorized space station in the 17/24 GHz BSS that complies with the technical rules in this part and will be located at least 4 degrees from the proposed space station.

\* \* \* \* \*

■ 2. Amend § 25.209 by revising paragraphs (a) through (c), removing and reserving paragraph (e), removing from paragraph (f) the word “procedures” wherever it appears and adding in its place the word “requirements,” and revising paragraph (h) to read as follows:

29-25log <sub>10</sub> θ .....	dBi	for 1.5°≤θ≤7°.
8 .....	dBi	for 7°<θ≤9.2°.
32-25log <sub>10</sub> θ .....	dBi	for 9.2°<θ≤48°.
-10 .....	dBi	for 48°<θ≤180°.

Where  $\theta$  is the angle in degrees from a line from the focal point of the antenna to the target satellite, and dB<sub>i</sub> refers to dB relative to an isotropic radiator. This

**§ 25.209 Earth station antenna performance standards.**

(a) Except as provided in paragraph (f) of this section, the gain of any earth station antenna operating in the Fixed-Satellite Service, including earth stations providing feeder links for

satellite services other than FSS, may not exceed the following limits:

(1) In the plane tangent to the GSO arc, as defined in § 25.103, for earth stations not operating in the conventional Ku-band, the 28.35–30 GHz band, or the 24.75–25.25 GHz band:

29-25log <sub>10</sub> θ .....	dBi	for 1.5°≤θ≤7°.
8 .....	dBi	for 7°<θ≤9.2°.
32-25log <sub>10</sub> θ .....	dBi	for 9.2°<θ≤48°.
-10 .....	dBi	for 48°<θ≤85°.
0 .....	dBi	for 85°<θ≤180°.

Where  $\theta$  and dB<sub>i</sub> are as defined in paragraph (a)(1) above. This envelope

envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from ±7–180°.

(2) In the plane tangent to the GSO arc, for earth stations operating in the conventional Ku-band:

29-25log <sub>10</sub> θ .....	dBi	for 2°≤θ≤7°.
8 .....	dBi	for 7°<θ≤9.2°.
32-25log <sub>10</sub> θ .....	dBi	for 9.2°<θ≤48°.
0 .....	dBi	for 48°<θ≤180°.

Where  $\theta$  and dB<sub>i</sub> are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from ±7–180°.

(4) In the plane perpendicular to the GSO arc, as defined in § 25.103, for earth stations not operating in the conventional Ku-band, 28.35–30 GHz band, or 24.75–25.25 GHz band:

(3) In the plane tangent to the GSO arc, for earth stations operating in the 28.35–30 GHz band:

32-25log <sub>10</sub> θ .....	dBi	for 3°<θ≤48°.
-10 .....	dBi	for 48°<θ≤180°.

Where  $\theta$  and dB<sub>i</sub> are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of  $\theta$  angles from ±3–180°.

(5) In the plane perpendicular to the GSO arc, for earth stations operating in the conventional Ku-band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

32-25log <sub>10</sub> θ .....	dBi	for 3°<θ≤48°.
-10 .....	dBi	for 48°<θ≤85°.
0 .....	dBi	for 85°<θ≤180°.

Where  $\theta$  and dB<sub>i</sub> are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of  $\theta$  angles from ±3–180°.

(6) In the plane perpendicular to the GSO arc, for earth stations operating in the 28.35–30 GHz band or 24.75–25.25 GHz band:

Outside the main beam, the gain of the antenna shall lie below the envelope defined by:

32-25log <sub>10</sub> θ .....	dBi	for 3.5°<θ≤7°.
10.9 .....	dBi	for 7°<θ≤9.2°.
35-25log <sub>10</sub> θ .....	dBi	for 9.2°<θ≤48°.
3 .....	dBi	for 48°<θ≤180°.

Where  $\theta$  and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 6 dB in 10% of the range of  $\theta$  angles from  $\pm 3$ –180°.

(b) Except as provided in paragraph (f) of this section, the off-axis cross-

polarization gain of any antenna used for transmission from an FSS earth station, including earth stations providing feeder links for satellite services other than FSS, may not exceed the following limits:

(1) In the plane tangent to the GSO arc, for earth stations not operating in the 28.35–30 GHz band or the 24.75–25.25 GHz band:

19-25log <sub>10</sub> $\theta$ .....	dBi	for 1.8°< $\theta$ ≤7°.
-2 .....	dBi	for 7°< $\theta$ ≤9.2°.

Where  $\theta$  and dBi are as defined in paragraph (a)(1) above.

(2) In the plane perpendicular to the GSO arc, for earth stations not operating in the 28.35–30 GHz band or the 24.75–25.25 GHz band:

19-25log <sub>10</sub> $\theta$ .....	dBi	for 3°< $\theta$ ≤7°.
-2 .....	dBi	for 7°< $\theta$ ≤9.2°.

Where  $\theta$  and dBi are as defined in paragraph (a)(1) above.

(3) In the plane perpendicular to the GSO arc, for earth stations operating in the 28.35–30 GHz band or 24.75–25.25 GHz band:

19-25log <sub>10</sub> $\theta$ .....	dBi	for 2°< $\theta$ ≤7°.
-2 .....	dBi	for 7°< $\theta$ ≤9.2°.

Where  $\theta$  and dBi are as defined in paragraph (a)(1) above.

(c)(1) An earth station licensed for operation with an FSS space station or registered for reception of transmissions from such a space station pursuant to Sections 25.131(b) and (d) is not entitled to protection from interference from authorized operation of previously authorized stations that would not cause harmful interference to that earth station if it were using an antenna with receive-band gain patterns conforming to the levels specified in Sections 25.209(a) and (b). For purposes of this rule, a previously authorized station is one that was licensed by the Commission or approved for U.S. market access prior to the licensing of the earth station receiving interference.

(2) The operator of an earth station licensed for operation with an FSS space station or registered for reception of transmissions from such a space station pursuant to Sections 25.131(b) and (d) may claim protection from harmful interference from operation of any station that is not previously authorized as that term is defined in paragraph (c)(1) of this section, unless such interference is permitted under a coordination agreement with the earth station operator or the operator of a space station with which the earth station communicates.

(3) A 17/24 GHz BSS telemetry earth station is not entitled to protection from harmful interference from authorized space station operation that would not cause harmful interference to that earth

station if it were using an antenna with receive-band gain patterns conforming to the levels specified in paragraphs (a) and (b) of this section. Receive-only earth stations in the 17/24 GHz BSS are entitled to protection from harmful interference caused by other space stations to the extent indicated in § 25.224.

\* \* \* \* \*

(h) The gain of any transmitting antenna in a gateway earth station communicating with NGSO FSS satellites in the 10.7–11.7 GHz, 12.75–13.15 GHz, 13.2125–13.25 GHz, 13.8–14.0 GHz, and/or 14.4–14.5 GHz bands must lie below the envelope defined as follows:

29-25log <sub>10</sub> ( $\theta$ ) .....	dBi	for 1°≤ $\theta$ ≤36°.
-10 .....	dBi	for 36°≤ $\theta$ ≤180°.

Where  $\theta$  and dBi are as defined in paragraph (a)(1) above. This envelope may be exceeded by up to 3 dB in 10% of the range of  $\theta$  angles from  $\pm 7$ –180°.

■ 3. Amend § 25.220 by redesignating paragraph (a)(1) as paragraph (a), removing paragraph (a)(2), removing and reserving paragraphs (d)(1)(i) and (d)(2), and revising the redesignated paragraph (a), paragraph (b), and the third sentence in paragraph (d)(1) introductory text to read as follows:

#### § 25.220 Non-conforming transmit/receive earth station operations.

(a) The requirements in this section apply to applications for, and operation

of, earth stations transmitting in the conventional or extended C-band, the conventional or extended Ku-band, or the 20/30 GHz bands that do not qualify for routine licensing under relevant criteria in §§ 25.134, 25.138, 25.211, 25.212, 25.218, 25.221(a)(1) or (3), 25.222(a)(1) or (3), 25.226(a)(1) or (3), or § 25.227(a)(1) or (3).

(b) Applications filed pursuant to this section must include the information required by § 25.115(g)(1).

\* \* \* \* \*

included in the coordination agreements referred to in the certification required by paragraph (d)(1)(ii) of this section only to the extent that protection from receiving interference is afforded by those coordination agreements.

\* \* \* \* \*

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(d)(1) \* \* \* The applicant will be granted protection from receiving interference from the satellite systems