Source of flooding and location	#Depth in feet above ground. *Elevation in feet (NGVD)
Approximately 0.57 mile upstream of the confluence with Broad Run	*266
Tributary No. 1 to Beaverdam Run:	
At the confluence with Beaverdam Run	*228
Approximately 0.47 mile upstream of confluence of Beaverdam Run	*234
Tributary to Horsepen Run:	
At confluence with Horsepen Run	*273
Approximately 0.71 mile upstream of the confluence with Horsepen Run	*321
Tributary to North Fork Broad Run:	
At confluence with North Fork Broad Run	*297
Approximately 1,770 feet upstream of confluence with North Fork Broad Run	*304
Tributary to Stallion Branch:	
At the confluence with Stallion Branch	*260
Approximately 0.44 mile upstream of the confluence with Stallion Branch	*260
Maps available for inspection at the Loudoun County Building, Building & Development Department, 1 Harrison Street, S.E., Leesburg, Virginia.	

(Catalog of Federal Domestic Assistance No. 83.100, ''Flood Insurance.'')

Dated: January 30, 2001.

Margaret E. Lawless,

Acting Executive Associate Director for Mitigation.

[FR Doc. 01–3922 Filed 2–15–01; 8:45 am]

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 1, 2 and 25

[ET Docket No. 98–206; FCC 00–418]

Fixed Satellite Service and Terrestrial System in the Ku-Band

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: This document permits non-geostationary satellite orbit (''NGSO'') fixed-satellite service (''FSS'') providers to operate in certain segments of the Ku-band, and adopts rules and policies to govern such operations. NGSO FSS can provide a variety of new services to the public, such as high speed Internet access, plus other types of high speed data, video and telephony services. NGSO FSS can bring advanced services to rural areas. This document also concludes that a new terrestrial fixed Multichannel Video Distribution and Data Service can share the 12.2–12.7 GHz band with satellite operations without causing harmful interference.

DATES: Effective March 19, 2001.

FOR FURTHER INFORMATION CONTACT: Tom Derenge, Office of Engineering and Technology, (202) 418–2451 and Jennifer Gilsenan, International Bureau, (202) 418–0757.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Order, ET Docket 98–206, FCC 00–418, adopted November 29, 2000, and released December 8, 2000. The full text of this Commission decision is available for inspection and copying during normal business hours in the FCC Reference Information Center, Room CY–A257, 445 12th Street, S.W., Washington, DC, and also may be purchased from the Commission's duplication contractor, International Transcription Service, (202) 857–3800, 1231 20th Street, N.W. Washington, DC 20036.

Summary of the Report and Order

1. The First Report and Order (''First R&O''), permits non-geostationary satellite orbit (''NGSO'') fixed-satellite service (''FSS'') providers to operate in certain segments of the Ku-band, and adopt rules and policies to govern such operations. It also adopts technical criteria so that NGSO FSS operations can share spectrum with incumbent services without causing unacceptable interference to them and without unduly constraining future growth of incumbent services or NGSO FSS system flexibility. Finally, the Commission concludes that a new terrestrial fixed Multichannel Video Distribution and Data Service (''MVDDS'') can operate in the 12.2–12.7 GHz band on a non-harmful interference basis with incumbent Broadcast Satellite Services (''BSS''), and on a co-primary basis with the NGSO FSS. By these actions, we provide for the introduction of new advanced services to the public, consistent with our obligations under Section 706 of the 1996 Telecommunications Act, and promote increased competition among satellite and terrestrial services.

NGSO FSS Gateway Bands

2. We find that we can permit deployment of NGSO FSS gateway earth stations and also protect the continued use and growth by terrestrial operations in the proposed bands. To accomplish this, we are limiting gateway use of the 12.75–13.25 GHz band to the 12.75–13.15 GHz and 13.2125–13.25 GHz band segments. Further, we are permitting gateway use of the 13.75–13.8 GHz band. Finally, we will permit service link, as well as gateway, use of the 14.4–14.5 GHz band. We recognize, however, that deployment of service links in the 10.7–11.7 GHz, 12.75–13.15 GHz, 13.2125–13.25 GHz, and 13.75–14.0 GHz bands could hinder future terrestrial service deployment in those bands. Therefore, to avoid the ubiquitous deployment of earth stations, we find it appropriate to allow only gateway earth station operations for NGSO FSS in those four bands. Further, because gateway earth stations will be located at sites readily identified to other users of the bands, this action increases the potential for co-frequency operation. We define NGSO FSS gateway earth stations as those earth stations that do not originate or terminate traffic, but interconnect multiple non-collocated user earth stations operating in frequency bands other than designated gateway bands, through a satellite with other primary networks, such as the public switched telephone network and Internet networks. That is, gateway earth stations will be required to operate in a manner that supports the switching and routing functions of the NGSO FSS system as a whole, as do feeder links for mobile-satellite systems or hub operations for very small aperture terminal (''VSAT'') networks.

3. Thus, we are adopting a functional definition for earth station use of this band, which should provide for various NGSO FSS system designs, regardless of what terminology is used by an applicant to describe the facility. Moreover, each NGSO gateway antenna will be required to meet an antenna performance standard of 29–25 log theta (θ) dBi in all directions, where theta (θ) is the earth station antenna off-axis angle relative to the main lobe of the antenna. We find that adopting this antenna performance standard will ensure that NGSO gateway antennas focus their signals in the desired direction without the need for minimum antenna size requirements, which could hinder innovation and flexibility. Additionally, to facilitate coordination with terrestrial facilities, we adopt our proposal requiring a single gateway complex to be located within an area of one second latitude by one second longitude. This requirement, which also applies to GSO FSS earth station sitings, facilitates earth station and terrestrial coordination in shared bands by specifying very limited areas for gateway antennas. Gateway antennas

outside of these areas will be considered as separate gateway complexes for the purposes of coordination with terrestrial services and for licensing purposes. Nevertheless, these interconnected gateway antennas could be under multiple licenses, or considered as a single gateway complex.

4. We do not find it is necessary at this time to limit the number of NGSO FSS earth stations that should be allowed to use the 10.7–11.7 GHz, 12.75–13.15 GHz, 13.2125–13.25 GHz, and 13.75–14.0 GHz bands. The applications that have been filed for Ku-band NGSO FSS systems do not reflect a need for a significant number of gateway stations. Therefore, the gateway earth station definition adopted here should be sufficient to prevent ubiquitous deployment of NGSO FSS earth stations in those bands. Nevertheless, as the NGSO FSS service grows to meet increasing capacity demands, any NGSO FSS network architecture changes resulting in a significant increase in the number of gateway stations can be addressed at that time. Finally, we clarify that this gateway definition applies only to NGSO FSS earth stations and not to GSO FSS operations in these bands. Although GSO FSS systems may operate gateway or hub earth stations that have some of the same characteristics as NGSO FSS gateway earth stations, GSO FSS earth stations operating in these bands are subject to separate requirements.

NGSO FSS Gateway Downlink Band: 10.7–11.7 GHz

5. We note that the International Telecommunications Union '' Radiocommunication Sector (''ITU–R'') studied the necessary criteria and power flux density (''PFD'') limits to allow NGSO FSS satellite downlinks to share spectrum with terrestrial fixed service (''FS'') operations. In particular, Working Party 4–9S reached agreement on a set of PFD limits in April 1999 that are adequate for the protection of the FS in the 10.7–12.75 GHz band from the aggregate of interference from GSO FSS systems and multiple NGSO FSS systems. The ITU–R studies considered various sharing issues between FS operations and NGSO FSS operations, including typical FS operation margins with automatic transmit power control (ATPC), the aggregate effect of multiple NGSO satellites, and other factors leading to interference concerns. The PFD limits agreed upon within the ITU–R for the 10.7–11.7 GHz band have been affirmed by 2000 World Radio Conference (''WRC–2000'').

6. These PFD limits were derived based on the operating characteristics of a majority of the FS links in the 10.7–12.75 GHz band. Based on the findings of the ITU–R, the decision taken at WRC–2000, and the record in this proceeding, we find that these PFD limits are adequate to protect the vast majority of terrestrial FS operations in the 10.7–11.7 GHz band from NGSO FSS satellite transmissions. Therefore, we adopt the ITU–R recommended PFD limits for NGSO FSS systems operating in the 10.7–11.7 GHz band. (See paragraph 38 of First R&O.) Additionally, we note that these PFD values are the same as those governing GSO operations in this band, except the NGSO PFD limits must be met in a 1 megahertz rather than a 4 kilohertz reference bandwidth. We are also modifying the GSO PFD limits to protect terrestrial services in § 25.208(b) of the Commission's Rules to a 1 megahertz reference bandwidth.

7. We conclude that the PFD limits adopted here do not need to be tightened to address mainbeam-to-mainbeam interference situations. Tighter PFD limits might overly constrain the NGSO FSS operations. Instead, any protection needed for the small number of FS links that might suffer from mainbeam interference can be accomplished on a case-by-case basis. For example, depending on the specific circumstances, several techniques may be used to mitigate mainbeam interference situations: (1) the FS link could be modified so that the operating margins or antennas can overcome any satellite interference; (2) NGSO FSS satellites could avoid transmitting mainbeam signals in the direction of the incumbent FS links pointed at their orbital path; (3) FS operations may be moved slightly to avoid mainbeam interference alignment; and (4) the FS link could be adjusted so that the ATPC level allows sufficient margin to overcome satellite interference.

8. In frequency bands with co-primary services, new entrants in a band must coordinate their operations with incumbent operations in order to minimize the possibility of harmful interference between the sharing services. Therefore, new NGSO FSS applicants that operate in bands used by the FS must ensure that their operations will not result in harmful interference to incumbent operations. In most cases, the PFD limits we are adopting should ensure this result. Because NGSO FSS systems will have different operational characteristics (*e.g.*, different minimum angles of operation), each NGSO FSS licensee will have to determine whether incumbent FS operations with elevation angles more than 5 degrees above the horizon will be affected and will be responsible for avoiding interference to incumbents, including possible mainbeam to mainbeam alignments. Likewise, if FS links are to be licensed after commencement of NGSO FSS operations, the FS applicant will be responsible for designing the link to be compatible with satellite operations, including possible mainbeam to mainbeam alignments. We are particularly concerned with incumbent FS operations that are used for public and other types of safety services. For these types of services, even rare interference occurrences could create an unacceptable public or safety hazard; thus, these operations should be protected from harmful interference.

Coordination of NGSO FSS with FS Stations

9. We conclude that coordination is important for sharing between NGSO gateway stations and terrestrial operations, and that both NGSO FSS and terrestrial interests will rely equally on coordination to protect their operations. The coordination procedures for FSS and terrestrial FS operations are specified in Parts 25 and 101 of our rules, respectively. These procedures outline the steps that an applicant must take in the coordination process, and are explained in more detail below. After reviewing the record and current coordination rules, we conclude that the current procedures, with some modification, shall be used to coordinate NGSO FSS and FS operations.

10. The coordination procedures for terrestrial FS operations with satellite operations are set forth in §§ 101.21(f) and 101.103 of the Commission's Rules. Generally, § 101.103 requires entities to complete coordination prior to filing an application for authorization. The applicant must, through appropriate analysis, select operating characteristics to avoid interference in excess of permissible levels to other spectrum users. Section 101.103 also outlines the notification and response elements of the coordination process, where applicants provide relevant information on their proposed operation to other potentially affected entities. Section 101.21(f) further outlines the coordination process for FS links sharing spectrum with satellite services. The FS applicant must first determine if its proposed link would lie within the coordination contour of existing satellite service earth stations. The applicant must also ensure that its proposed operations would not exceed the

permissible level of interference allowed by our rules. We find that the information specified and the process outlined in Part 101 of our rules are adequate for coordination between FS operations and satellite operations and do not need modification.

11. We are revising some of the Part 25 coordination rules for satellite operations to accommodate new NGSO FSS systems. The Commission found that because the international coordination procedures contained in Appendix S7 of the ITU Radio Regulations (''RR'') changed frequently, it would simply reference Appendix S7 in our rules. Therefore, we amend § 25.203 to reflect that information regarding calculation of coordination information can be found in Appendix S7 of the ITU RR and to reflect the relevant NGSO gateway station coordination information that must be provided to terrestrial users.

12. Appendix S7 has been modified at WRC–2000 to account for coordination between NGSO FSS operations and FS operations. The ITU has developed modified procedures Recommendation ITU–R IS.849 (''IS.849'') to the ITU method of calculating coordination contours to account for the characteristics of NGSO versus GSO systems. If FS entities believe that changes to Appendix S7 are not sufficient to address the coordination situation in the United States, they can request that we revisit the coordination procedures for this band. Therefore, other than amending Part 25 to consider NGSO FSS sharing with FS systems, we will make no other changes in our coordination process for operations in the 10.7–11.7 GHz portion at this time.

13. Regarding the use of radio frequency (''RF'') shielding, we find that RF and terrain shielding will be useful tools in the coordination and deployment of NGSO FSS gateway stations. However, we find that mandatory shielding requirements would be unnecessarily burdensome on NGSO FSS operations. Further, although ''virtual shielding'' may encourage NGSO FSS entities to site their gateways to take advantage of natural terrain shielding, it would place the burden solely on the NGSO entity to provide for shielding in order to share with FS operations. Our coordination and service rules already require Commission applicants and licensees to deploy their operations in such a manner as to avoid harmful interference to other spectrum users, to cooperate fully and make reasonable efforts to resolve technical problems that may inhibit the most efficient use of the spectrum, and to avoid blocking the growth of systems as prior coordinated. Therefore, we encourage entities that wish to use the 10.7–11.7 GHz band to use various types of shielding to meet these requirements. In particular, because NGSO FSS gateway operations do not focus their signals in a single direction like FS operations, we encourage them to accept shielding by subsequent FS entrants if the FS entity agrees to pay for it, as suggested by SkyBridge.

Gateway Siting Restrictions

14. We conclude that the record supports the adoption of some restrictions on NGSO FSS deployment in the 11 GHz and 13 GHz gateway bands in specified geographic areas in order to protect incumbent services use of the bands. Because any restrictions on gateway stations using downlink bands would apply as a practical matter to their corresponding uplink bands, any regulatory scheme to promote spectrum sharing between NGSO FSS gateway operations and incumbent operations needs to address the needs of incumbent operations in both the uplink and downlink bands. The record indicates that geographic protection zones will not only benefit FS operations in the 11 GHz band, including both incumbent operations and those that will relocate from other bands, but also Broadcast Auxiliary Service (''BAS'') and Cable Television Relay Service (''CARS'') operations in the 12.75–13.25 GHz band. TV stations in major metropolitan areas, for example, may need some form of protection in specified geographic areas to ensure that TV stations will be able to deploy new BAS operations to accommodate the transition to digital TV.

15. We agree with the majority of commenters that the growth zone concept, which focuses on coordination procedures to protect incumbent services within specified geographic areas, would provide a more efficient and flexible approach to band sharing than exclusion zones in most cases. We also concur with commenters that the implementation of the growth zone concept would appropriately be included in existing coordination procedures, which would not require direct Commission involvement. Nonetheless, we conclude that, based on the record here, the growth zone concept needs further analysis in order to address better the needs of all affected parties. We also must analyze whether, in order to provide equitable band sharing with mobile and temporary fixed BAS and CARS operations in the 13 GHz band, the growth zone concept has to include some exclusion areas for siting NGSO FSS gateway stations or whether other coordination methods may promote band sharing between these services. Thus, in a future separately docketed proceeding, we will evaluate methods for defining growth zones that serve all interested parties in the NGSO FSS gateway bands (10.7–11.7 GHz, 12.75–13.25 GHz, and 13.8–14.0 GHz bands).

Restrictions on GSO FSS Operations

16. We are adopting our proposals to remove the international requirement for NGSO FSS systems in the 10.7–11.7 GHz band and to permit such systems to use the entire band. These proposals were broadly supported, and the record demonstrates that the band can be shared by the NGSO FSS and FS. We also find persuasive the arguments of the FS community that expanded GSO FSS use of this band should not be permitted. We believe that FS growth could be significantly inhibited if we were to authorize domestic and international GSO FSS use of the entire band because of the large number of GSO earth stations that would likely be deployed. Further, we find that other bands that are available for FSS downlink use are adequate to ensure GSO FSS growth. Accordingly, we adopt our proposals and limit domestic and international FSS use of the entire 10.7–11.7 GHz band to NGSO FSS gateways. GSO FSS earth stations will continue to operate internationally in accordance with NG104.

NGSO/GSO FSS Downlink Sharing

17. After evaluating the extensive record in this proceeding, including the work of the ITU–R study groups and the results of the WRC–2000, we find that the compromise solutions reached in the international meetings provide the basis to allow NGSO FSS operations to share successfully with GSO FSS networks without causing unacceptable interference. The specific technical conclusions from these meetings, which are included in the record in this proceeding and have been incorporated into the Provisional Final Acts of WRC–2000, represent the most comprehensive and current studies on NGSO FSS and GSO FSS co-frequency operations to date. We conclude that these power limits, which include single-entry equivalent power flux density (''EPFD'')$_{down}$ limits and aggregate EPFD$_{down}$ limits for NGSO FSS operations, adequately protect GSO FSS operations and we will require NGSO FSS systems to comply with each type of limit, as appropriate. In addition, we find that the single-entry and aggregate

EPFD limits we are adopting also define the level of acceptable interference from a NGSO FSS system into a GSO FSS system under our rules.

18. Further, we note that WRC–2000 modified footnotes S5.441 and S5.484A to indicate that NGSO FSS applications are subject to standard ITU coordination under S9.12 with other NGSO FSS systems. These footnotes also state that NGSO FSS systems shall not claim protection from GSO systems operating in accordance with the ITU Radio Regulations and that NGSO FSS systems shall operate in such a way that any unacceptable interference that may occur during their operations shall be rapidly eliminated. We find that the modifications to footnotes S5.441 and S5.484A are consistent with our decisions in this document and, accordingly, adopt the WRC–2000 version of these footnotes in our Table of Frequency Allocations.

Single-Entry $EPFD_{down}$ Limits

19. Single-entry limits define the $EPFD_{down}$ limits that must be met by each NGSO FSS system resulting from emissions from all satellites in the system. There are 3 elements comprising the single-entry limits that must be met by each NGSO FSS system: (1) ''validation'' $EPFD_{down}$ limits, as well as more stringent ''validation'' $EPFD_{down}$ limits for specific size antennas located at high latitudes; (2) ''operational'' $EPFD_{down}$ limits, which protect against synchronization loss (''sync loss'') in GSO FSS earth stations between 3 and 18 meters in diameter; and (3) ''additional operational'' $EPFD_{down}$ limits, or ''operational masks'' for 3 meter and 10 meter GSO FSS earth stations. It is the combination of these single entry limits with the aggregate limits discussed below that provides adequate protection of GSO FSS networks from NGSO FSS interference.

20. The limits adopted by WRC–2000 were developed using the agreed upon criteria developed by the ITU–R. The JTG 4–9–11 (1) studied the characteristics of the GSO FSS systems to be protected, (2) defined protection criteria for GSO FSS systems, and (3) based on these parameters, determined the level of interference that could be accepted from NGSO FSS systems. We find, based upon the technical work adopted by the WRC–2000 and the record developed in this proceeding, that the international consensus single-entry $EPFD_{down}$ limits for 0.6, 1.2, 3, and 10 meter GSO FSS receive earth station antennas are appropriate for adoption domestically. Specifically, we believe that NGSO FSS adherence to the three elements of the single entry limits (i.e., validation limits, operational limits, and additional operational limits), as well as the aggregate limits discussed below, will adequately protect GSO FSS networks. We adopt these limits as new rule §§ 25.208(g), 25.208(i), and 25.208(j) of the Commission's Rules.

GSO FSS Reference Earth Station Antenna Pattern

21. The GSO FSS earth station antenna pattern is an important component in the assessment of interference from NGSO satellites into GSO FSS earth station receivers. The new GSO FSS reference pattern differs from the requirement currently specified in § 25.209 of the Commission's Rules. The Section 25.209 requirement was developed to facilitate GSO to GSO sharing where a constant level of interference is present. The new reference pattern, on the other hand, takes into account the transient nature of NGSO FSS interference by averaging the peaks and nulls of a GSO FSS earth station antenna, rather than conservatively specifying an envelope of the sidelobe peaks. Accordingly, we will incorporate the new GSO FSS reference antenna pattern in the rules for $EPFD_{down}$. This new pattern will be assumed whenever interference assessments between GSO FSS and NGSO FSS systems are performed. We do not see the need, however, to modify the antenna performance standards contained in § 25.209 of the Commission's Rules. This requirement remains applicable to sharing scenarios involving a constant level of interference (e.g., GSO to GSO sharing) and will continue to be the standard used for FSS earth station licensing.

Domestic Implementation of Single-Entry Limits

22. We are adopting implementation procedures for single-entry validation limits and a separate set of procedures for operational and additional operational limits. We believe that the specific implementation measures discussed will ensure that NGSO FSS systems will indeed adhere to the applicable EPFD limits. In addition to ensuring protection of GSO FSS networks, the implementation framework will assist the Commission in its need to confirm to the ITU that the appropriate limits are being met. Further, it will enable the quick identification of any NGSO FSS operations in excess of the single-entry limits.

Domestic Implementation of Single-Entry Validation $EPFD_{down}$ Limits

23. As the notifying Administration to the ITU for U.S.-licensed NGSO FSS systems, we need to be confident that the NGSO FSS system information we send to the Radiocommunications Bureau of the ITU (''ITU–BR'') is accurate and that the validation test used domestically is the same as that used by the ITU–BR and other Administrations. These assurances will provide consistency in the output of the validation test and enable these results to be reproduced by all affected Administrations. Therefore, we will require each NGSO FSS applicant to demonstrate prior to licensing that it meets the $EPFD_{down}$ validation limits. Further, we agree with commenters that the software used for the validation test should be developed in accordance with the ITU software specification contained in ITU–R Recommendation BO.1503.

24. Specifically, each NGSO FSS applicant shall provide the following information, detailed in § 25.146(a)(1) of the Commission's Rules, to the Commission: (1) output of the validation test consisting of cumulative density function curves of $EPFD_{down}$ as a function of percentage of time not to be exceeded; (2) comparison of output/results to ''validation'' $EPFD_{down}$ limits; (3) PFD mask used as input parameter in simulation; (4) identification and description of assumptions and conditions used in generating the PFD mask; (5) other NGSO FSS system input parameters required for the execution of the software, and (6) actual software used by the NGSO FSS operator in implementing the ITU–R Recommendation BO.1503 software specification, including the source code and the compiled executable program. The Commission will verify this information. Once we are satisfied that the NGSO FSS applicant has demonstrated its ability to comply with the validation $EPFD_{down}$ limits, we will submit the required information to the ITU–BR. As noted above, the ITU–BR will then use this information to make its own determination of compliance with the validation limits.

Domestic Implementation of Operational and Additional Operational $EPFD_{down}$ Limits

25. We will require each NGSO FSS licensee to demonstrate that it meets the operational and additional operational limits prior to the NGSO FSS system being placed into service. Indeed, much of the critical protection to GSO FSS networks comes from the operational and additional operational limits that

will not be subject to ITU verification. We find this demonstration is necessary prior to the NGSO FSS becoming operational because it: (1) provides the FCC assurance that the NGSO FSS system will be built in accordance with FCC rules; (2) provides incumbent operators assurance that they will not receive unacceptable interference; (3) in the case of the additional operational limits, enables the Commission to make the required commitment to the ITU–BR; and (4) reduces the likelihood that the Commission would need to apply remedial measures to bring an operational system into compliance. Moreover, we believe a comprehensive demonstration of compliance with both the operational and additional operational limits is warranted due to the infancy of NGSO FSS systems. Once the Commission and industry gain experience through actual operation of these new systems, the Commission may choose to revisit the requirement for such a detailed demonstration prior to an NGSO FSS system becoming operational. Authority to operate the space station segment will be conditioned on the NGSO FSS licensee submitting to the Commission 90 days prior to the initiation of service, a demonstration that its system is expected to meet the operational and additional operational limits, see § 25.146(b) of the Commission's rules.

26. We find that there is no need for the Commission to develop additional procedures or remedies in cases where NGSO FSS systems exceed the operational and additional operational $EPFD_{down}$ limits that we are adopting. NGSO FSS operations that exceed these limits will be in violation of §§ 25.208(i) and 25.208(j) of the Commission's Rules, as well as in violation of its Commission authorization. Therefore, the NGSO FSS licensee will already be subject to appropriate sanctions by the Commission.

27. We do believe, however, that in the event that a NGSO FSS satellite exceeds the operational or additional operational $EPFD_{down}$ limits, it is important that GSO FSS operators have the information necessary to locate satellites in each NGSO FSS constellation at any given time. Such information will allow the GSO FSS operator to correlate any alleged interference with a specific satellite in an NGSO FSS system. This information, or ephemeris data, is already used by NGSO FSS customers to establish the communications link between the user terminal and the NGSO satellite as it moves across the horizon, and so it should not be an additional burden on NGSO FSS system operators. Therefore, we will require that NGSO FSS licensees publish their satellites' orbital elements in the North American Aerospace Defense Command (NORAD) 2-line element format on an Internet web site maintained by the NGSO FSS licensee. The 2-line element format for many existing satellites is already being generated by NORAD and distributed by NASA via the NASA Prediction Bulletin. Moreover, the 2-line element set can be used together with NORAD's Simplified General Perturbation-4 (SGP4) orbital model, or similar programs, to determine the position and velocity of the associated satellite. We recognize that the NGSO FSS constellation is constantly moving, and so we will require that the NORAD 2-line element data be updated every three days so that the most accurate information is published. These procedures are outlined in new § 25.271(e) of the Commission's Rules.

Aggregate $EPFD_{down}$ Limits

28. We find that the cumulative level of interference from all co-frequency NGSO FSS systems, (i.e. the aggregate level), is what must be limited. Therefore, we adopt aggregate validation $EPFD_{down}$ limits in addition to the single-entry $EPFD_{down}$ limits. These limits are contained in § 25.208(h). In fact, the single-entry $EPFD_{down}$ validation limits contained in § 25.208(h) were derived from these aggregate validation $EPFD_{down}$ limits using the methodology contained in ITU–R Recommendations and assuming a conversion factor of 3.5. We find use of the 3.5 conversion factor is appropriate because it takes into account the way in which interference from multiple systems aggregates into a GSO FSS earth station antenna, recognizing that the interference is not strictly additive in a linear or power sense. The ITU–R agreed that ''[a] value of 3.5 for $N_{effective}$ was to be used to determine the final values of single-entry $EPFD_{down}$ versus percentage of time to be applied in bands currently covered under Resolution 130 (WRC–97). This value is to be used solely for the purpose of deriving single-entry $EPFD_{down}$ masks from aggregate $EPFD_{down}$ masks and is not a representation of the actual number of non-GSO FSS systems that can share a given frequency band.''

29. Although we agree on the importance of requiring NGSO FSS systems to meet aggregate limits, we see many practical difficulties in actually verifying compliance with aggregate limits of any kind. We will not require a demonstration of NGSO FSS compliance with the aggregate limits at this time. Rather, we will require each NGSO FSS licensee to certify to us that it will meet the limits set out in § 25.208(h). We note that this issue is the subject of further study within the ITU–R. In the future, as these studies progress, we may require each NGSO FSS applicant to demonstrate its ability to meet the aggregate $EPFD_{down}$ limits contained in § 25.208(h) of the Commission's Rules. We, therefore, place NGSO FSS applicants on notice that the requirement for such a demonstration will be addressed, as necessary in the NGSO FSS to NGSO FSS rule making or in the NGSO FSS authorization itself.

Protection of Very Large Earth Station Antennas

30. We recognize that the ITU–R studies in this area are the most extensive to date and find the agreements to be appropriate for adoption domestically as well. Accordingly, coordination will be required between specific GSO FSS earth stations and NGSO FSS systems meeting the conditions specified in § 25.146(f).

31. While we are not adopting coordination procedures for antennas between 10 and 18 meters, as originally proposed in the NPRM, we did adopt operational $EPFD_{down}$ limits which would provide protection to these GSO FSS earth stations. Information from the Commission's earth station database reveals that the number of earth station antennas greater than 10 meters in diameter is very small—approximately 20 corresponding to 0.5% of the earth stations licensed by the Commission in the 11.7–12.2 GHz band. Further, almost all of the GSO FSS earth station antennas larger than 10 meters in diameter have been in operation for many years, utilize older technology, and are likely to be phased out over time. This is because advances in satellite earth station technology have given way to today's use of smaller, less costly earth station antennas. We believe it would be detrimental to the nascent NGSO FSS service to adopt $EPFD_{down}$ masks or require coordination to protect the limited number of earth stations that are between 10 and 18 meters in diameter. As recognized by the GSO FSS entities, in the unlikely event of NGSO FSS interference into this limited number of earth stations, GSO FSS operators would have the opportunity to mitigate against any interference.

Protection of Inclined Orbit Operations

32. The ITU–R concluded that no additional protection is needed for earth

stations operating with GSO FSS satellites inclined up to 2.5 degrees. Operations with GSO FSS satellites inclined greater than 2.5 degrees and less than or equal to 4.5 degrees would, however, receive additional protection through the operational limits. We believe this is the appropriate approach for adoption domestically and have incorporated these operational $EPFD_{down}$ limits into our Rules. Protection of operations for GSO FSS satellites inclined greater than 4.5 degrees is more difficult because inclined operations basically extend the north-south extension of the geostationary satellite orbit. However, the number of U.S. licensed satellites that continue to provide service while at inclinations greater than 4.5 degrees is extremely limited, and § 25.280 of the Commission's Rules does not provide additional protection to GSO FSS satellites beyond that provided to GSO FSS satellites that are operating without inclination. Thus, we do not adopt specific protection requirements for GSO operations inclined beyond 4.5 degrees. However, we urge both NGSO and GSO operators to make good faith efforts to coordinate their respective operations.

Protection of GSO FSS Telemetry, Tracking and Command

33. Because of the critical nature of transfer orbit operations, we adopt the proposal in the *Notice of Proposed Rule Making* (NPRM), 64 FR 1786 January 12, 1999, to require consultation between GSO FSS and NGSO FSS licensees to minimize the impact of interference. The impact of NGSO FSS operation on GSO FSS transfer orbit operations will be infrequent and of a short time period, therefore, these events can be coordinated ahead of time in order to avoid unacceptable interference. With respect to emergency TT&C operations, there was agreement within the ITU–R that, during emergency operations in general, any GSO or NGSO FSS operator should be allowed to use any means necessary to regain communications with the satellite. We agree with this position because the measures required to reacquire communications and regain control of the GSO satellite cannot be predetermined. Although we do not adopt any specific measures for NGSO FSS systems to protect GSO FSS systems during emergency telemetry, tracking and command (''TT&C'') operations, we urge both GSO FSS and NGSO FSS operators to coordinate with each other if such a situation were to occur. The ITU–R, however, was not conclusive with respect to the protection of the operational phase TT&C. There has not been any demonstration that leads us to believe that the telemetry downlinks will not be protected by the $EPFD_{down}$ limits we adopt today. We will not, therefore, adopt specific measures for NGSO FSS protection of GSO FSS telemetry downlink operations at this time. We will closely follow, however, the ongoing work within the ITU–R and consider its conclusions in the development of conditions, if necessary, to be placed on NGSO FSS licensees.

NGSO FSS Gateway Uplink Bands: 12.75–13.25 GHz

34. We will permit NGSO FSS gateway uplink stations to operate in the 12.75–13.25 GHz band on a co-primary basis with incumbent users, except that we will not allow NGSO FSS to operate at 13.15–13.2125 GHz. We also conclude that although we will permit NGSO FSS operations in this band, we will not remove the requirement that GSO FSS operations be limited to international systems. As we discussed regarding the 10.7–11.7 GHz band, we believe that the growth of incumbent services would be significantly inhibited if we were to authorize domestic and international GSO FSS use of the 12.75–13.25 GHz band, due to the large number of GSO FSS earth stations that would likely be deployed, and we note that other bands are available for GSO FSS growth.

NGSO FSS Gateways Sharing With BAS Operations

35. Because BAS operations have primary allocation status in the 12.75–13.25 GHz band, such incumbent operations are entitled to interference protection from NGSO FSS gateway uplinks. Further, we find that it is important to allow BAS operations to maintain flexibility in establishing temporary links and operating mobile ENG operations. As discussed, some form of geographic protection area will be developed for locating NGSO FSS gateway earth stations that should prevent NGSO FSS gateways from hindering mobile and temporary fixed BAS use of this band. We conclude that fixed BAS and CARS operations can coordinate with NGSO FSS gateway stations, and new coordination procedures for use by these services must be developed.

36. Regarding protection of mobile BAS operations, we note that § 74.602 of our rules provides for the exclusive use of channels A19, A20, B19 and B20 in the 13.15–13.2125 GHz band by TV BAS and CARS pickup operations within 50 km of the top 100 television markets. In order to permit BAS and CARS entities to continue remote pickup operations throughout the U.S., we are extending exclusive use of the 13.15–13.2125 GHz band for BAS and CARS pickup operations to all 211 TV markets, thereby precluding NGSO FSS operations from this band segment. We find that this will not have a significant impact on NGSO FSS satellite operations because of the remaining amount of gateway uplink spectrum being made available. We take this action with the expectation that BAS mobile operations, especially those in TV markets where BAS is not extensively deployed, will concentrate their mobile use on the four channels in the 13.15–13.2125 GHz band, thereby leaving the remaining portion of the 12.75–13.25 GHz band spectrum available for NGSO FSS use.

NGSO FSS Gateway Coordination With Terrestrial Operations

37. We conclude that NGSO FSS gateway uplink stations can operate in the 12.75–13.15 GHz and 13.2125–13.25 GHz bands on a co-primary basis with FS operations, using coordination procedures. As an initial matter, we find that Part 74 and Part 78 terrestrial fixed operations should be able to coordinate with NGSO FSS gateway stations under the coordination procedures set forth in Part 101 and Part 25. As we discussed, NGSO FSS and fixed operations in the 10.7–11.7 GHz band will be able to coordinate their operations under the procedures in Part 101 for fixed operations and Part 25 for satellite operations. The NGSO FSS and fixed operations in the 12.75–13.25 GHz band are technically similar to operations in the 11 GHz band; thus, coordination with fixed links at 13 GHz under existing procedures also is possible. Part 74 BAS operations and Part 78 CARS operations have their own coordination procedures, but these procedures do not provide for sharing with NGSO FSS operations, and existing coordination procedures for FSS operations do not address coordination between satellite and mobile or BAS and CARS operations. For example, BAS is often licensed for the entire 12.7–13.25 GHz range, providing flexibility to coordinate temporary operations locally with other licensees in the band. While these procedures have worked with regard to fixed operations because unused individual channels can be identified and made available on an informally coordinated basis to the mobile BAS operation, we believe that this type of coordination flexibility for BAS could be difficult to achieve with NGSO FSS gateway uplink stations, which may use all available frequencies in an area.

Therefore, we conclude that new coordination procedures need to be developed for sharing between NGSO FSS and BAS and CARS operations in the 12.75–13.25 GHz band. Accordingly, we are deferring to a later proceeding a decision on specific coordination procedures that will be used for BAS/CARS and NGSO FSS operations in this band. Further, we will not license any NGSO FSS earth station in the 12.75–13.15 GHz and 13.2125–13.25 GHz bands until appropriate coordination rules are adopted.

NGSO FSS Gateways Sharing With GSO FSS Uplinks

38. NGSO FSS systems will have to meet the same $EPFD_{up}$ limit at the geostationary satellite orbit, regardless of whether the NGSO FSS system transmission emanates from a gateway or user earth station facility. In order to protect uplinks to GSO FSS satellites, we adopt the single-entry validation $EPFD_{up}$ limits as adopted by WRC–2000, as new rule § 25.146(h). The definition of $EPFD_{up}$ includes information regarding the GSO satellite receive antenna directivity for the same reason that the GSO FSS receive earth station antenna pattern is included in the $EPFD_{down}$ definition. Specifically, accounting for GSO FSS satellite antenna directivity limits the number of NGSO FSS earth stations contributing interference in the direction of the GSO satellite and provides a more realistic calculation of the interference level received. Further, the reference GSO FSS space station antenna patterns contained in ITU–R Recommendation S.672 were adopted for the calculation of $EPFD_{up}$. As noted by Boeing, the JTG 4–9–11 reached a consensus agreement that the provisional $EPFD_{up}$ limit is appropriate, even in light of the change in definition. We also find that the $EPFD_{up}$ limits we are adopting will also protect GSO FSS satellites operating in inclined orbits. We also find that the same implementation procedures adopted for the validation $EPFD_{down}$ limits described above in the section titled ''Domestic Implementation of Single-Entry Validation $EPFD_{down}$ Limits'' are also appropriate for adoption for the $EPFD_{up}$ limits.

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39. We find that NGSO FSS gateway stations should be able to share the 12.75–13.15 GHz and 13.2125–13.25 GHz bands with CARS eligibles, provided those operations use technical and operational techniques such as one-way, point-to-point, narrow beam antenna transmissions, as required under existing rules, that facilitate coordination. Some issues that might affect operations in the 12.75–13.15 GHz and 13.2125–13.25 GHz bands will be deferred to a future proceeding, such as possible geographic protection areas, some coordination issues, and other NGSO FSS gateway parameters. We also note that the Commission has not yet decided whether to expand CARS eligibility to include private cable operator (''PCO'') operations in the 12.75–13.25 GHz band; this decision will be made in CS Docket No. 99–250. Nonetheless, the sharing potential between NGSO FSS and CARS depends primarily on the technical and operation characteristics of the services, not licensee eligibility. Consequently, we see no need to defer our decision regarding NGSO FSS use of this band.

NGSO FSS Gateway Uplink Bands: 13.75–14.0 GHz

40. We adopt our proposal to allow NGSO FSS Gateway uplink operations in the 13.8–14.0 GHz band and find that the agreements at WRC–2000 justify permitting NGSO FSS Gateway uplink operations in the 13.75–13.80 GHz portion as well. Although the Department of Defense (''DoD'') and the National Telecommunications and Information Administration, Department of Commerce (''NTIA'') express some reservations, they are primarily concerned about interference that may be caused to FSS operations from the radiolocation service. Further, NTIA is concerned with WRC–2000 changes to footnote S5.502 would constrain radiolocation operations by limiting the effective isotropic radiated power (''e.i.r.p''). of a radiolocation station to 59 dBW in all directions, rather than just in the direction of the geostationary orbital arch, as previously required. While these concerns continue to be an issue that will be addressed at the 2003 World Radio Conference (''WRC–2003''), we see no reason to withhold this band from NGSO FSS use. FSS entities were aware of existing high powered radiolocation operations when they requested access to this spectrum. Therefore, we believe FSS systems can design their satellites to compensate for incumbent operations and find usable spectral capacity in this spectrum. At the same time, FSS entities will not be permitted to claim protection from radiolocation operations.

41. At this time, we are not implementing the specific WRC–2000 changes to footnote S5.502 in our Table of Frequency Allocations due to concerns of NTIA. However, some aspects of the new footnote are worth adopting, such as removing the minimum power requirement on FSS operations in the 13.75–14.0 GHz band. As stated, FSS licensees are aware of the interference environment in this band due to incumbent radiolocation operations and should be permitted to operate at lower powers if they can achieve communications. Therefore, we are adopting a new footnote US356 that is the same as the old footnote S5.502 regarding limits on radiolocation operations, but it removes the minimum power requirement for FSS operations. Further, to prevent confusion, we will delete S5.502 from our Table of Frequency Allocations.

42. Regarding specific concerns with tracking data and relay satellite system (''TDRSS'') operations in the 13.75–13.80 GHz portion and the WRC–2000 changes to footnote S5.503, we note that the 51 dBW/6 megahertz e.i.r.p. density limit was developed considering TDRSS operations and should be adequate. However, NTIA indicates that the National Aeronautic and Space Administration (''NASA'') has requirements for TDRSS protection across a 10 megahertz segment at 13.77–13.78 GHz to accommodate communications with the International Space Station. We find it is important to protect TDRSS operations in this band because they support missions that include manned flight. Therefore, we will extend the e.i.r.p. density limit across the 10 megahertz segment as requested by NTIA by adopting new footnote US357 for all FSS earth stations, which accomplishes the goals of S5.503 (WRC–2000), but protects TDRSS across the 13.77–13.78 GHz band. Accordingly, we remove footnote S5.503 from our Table of Frequency Allocations. We also modify § 25.204(f) of our Rules to reflect these new power requirements for FSS operations in the 13.75–14.0 GHz band. We believe this limit will protect NASA TDRSS operations from different types of NGSO FSS systems and not only the SkyBridge specific design. Nevertheless, we maintain the requirements of US337 that earth stations in the FSS coordinate on a case-by-case basis with NTIA's Frequency Advisory Subcommittee (''FAS'') in order to minimize interference to TDRSS operations. Any further interference concerns regarding NGSO FSS and TDRSS operations can be addressed further in the coordination process.

43. We find that the technical requirements adopted are adequate to permit spectrum sharing throughout the 13.75–14.0 GHz band. Further, any additional frequency sharing concerns can be addressed in the coordination process of FSS earth stations in the 13.75–14.0 GHz band with Federal

Government operations through NTIA's FAS. FAS coordination will ensure that FSS earth stations do not interfere with receiving radiolocation stations, the TDRSS forward link-to-low earth orbit satellite (''LEO''), and the TDRSS receiving earth stations located at White Sands Complex, NM and Guam. We note that FSS earth stations that share spectrum with Federal Government operations are required to coordinate with the FAS to avoid interference problems to Federal Government receiving stations. Additionally, FSS entities will not be permitted to claim protection from radiolocation operations.

44. Finally, we adopt the same $EPFD_{up}$ limits for the 13.75–14.0 GHz band that we adopt for the 12.75–13.25 and 14–14.5 GHz bands, as contained in § 25.208(k) of the Commission's Rules. We find these limits are equally applicable to both bands because the sharing environments between NGSO FSS and GSO FSS systems are similar.

GSO FSS Gateway Uplink Bands: 14.4–14.5 GHz

45. We find the $EPFD_{up}$ limits that we are adopting for the 12.75–13.15 GHz and 13.2125–13.25 GHz bands to permit sharing between GSO FSS uplinks and NGSO FSS gateway uplinks to be equally appropriate to permit such sharing in the 14.4–14.5 GHz band. We also find that permitting NGSO FSS gateway uplink use of the 14.4–14.5 GHz band will not adversely impact secondary uses of the band. Finally, we find persuasive SkyBridge's and Loral's contentions that also permitting NGSO FSS user terminal use of the band is desirable and will not create an unacceptable interference risk to incumbent users. Accordingly, we will permit NGSO FSS uplink use of the band by both gateways and user terminals.

NGSO FSS Gateway Uplink Bands: 17.3–17.8 GHz

46. In the Report and Order in IB Docket No. 98–172, we allocated the 17.3–17.7 GHz band to the Broadcast Satellite Service (''BSS'' also referred to as Direct Broadcast Satellite, or ''DBS'') on a primary basis, effective April 1, 2007. BSS, by definition, is in the downlink direction only. The corresponding feeder link frequencies for BSS are in FSS uplink allocations. The terms BSS and DBS have the same meaning, and can be used interchangeably. While the Region 2 BSS allocation covers the entire 17.3–17.8 GHz band, we did not allocate the 17.7–17.8 GHz sub-band to BSS operations because of spectrum incompatibilities with existing terrestrial fixed operations in that band. We agree with EchoStar and DIRECTV that sharing of the 17.3–17.7 GHz band by ubiquitous BSS downlinks and NGSO FSS uplinks would be difficult. The resulting limitation on the location of BSS receive earth stations would be overly restrictive on ubiquitous BSS receivers. We also find that sharing of the 17.3–17.7 GHz band between the radiolocation and NGSO FSS operations would be problematic. Further, NTIA requests that the Commission not authorize any NGSO FSS operations in the 17.3–17.7 GHz band. As we noted in the NPRM, the radiolocation service and GSO BSS feeder links are able to share this band only because radiolocation systems operate at powers of less than 51 dBW in the direction of the GSO arc. Satellites in other orbits could receive higher levels of interference, as radiolocation systems will be radiating indiscriminately in directions outside of the plane of the GSO arc in a manner that is not able to be predetermined or constrained in order to fulfill the functions of the radiolocation operation. Accordingly, we decline to allocate the 17.3–17.8 GHz band to the NGSO FSS.

NGSO FSS Service Downlink Bands: 11.7–12.2 GHz

47. As we noted in the NPRM, the sharing scenario in the 11.7–12.2 GHz band raises issues similar to those regarding NGSO FSS gateway downlinks in the 10.7–11.7 GHz band. For the reasons discussed above, we adopt the same $EPFD_{down}$ limits for NGSO FSS service downlinks in the 11.7–12.2 GHz band that we are adopting for NGSO FSS gateway downlinks in the 10.7–11.7 GHz band. While NGSO FSS service downlink stations will be ubiquitously deployed and will have different antenna characteristics than the gateway downlink stations, the $EPFD_{down}$ limits were developed to address both types of operations. We also conclude that since NGSO FSS gateway stations will be operating using the same $EPFD_{down}$ limits as NGSO FSS user earth station, NGSO FSS gateway earth station may operate in this 11.7–12.2 GHz band. In addition, we adopt the same coordination procedures to protect GSO FSS networks using sensitive receiving earth stations with very large antennas.

NGSO FSS Service Downlink Bands: 12.2–12.7 GHz

48. We note that an extensive record has been filed concerning spectrum sharing in the 12.2–12.7 GHz band by NGSO FSS, BSS and MVDDS operations, and interested parties subsequently reached a compromise solution to NGSO FSS and BSS sharing issues at a November 1999 WRC–2000 Conference Preparatory Meeting (''CPM'') which was ultimately adopted at WRC–2000. We thus find that we have an adequate record to make decisions on future NGSO FSS, MVDDS and BSS operations in the 12.2–12.7 GHz band.

49. We are allocating the 12.2–12.7 GHz band to the fixed satellite service for use by non-geostationary orbit satellite downlink operations on a co-primary basis. This action will be implemented domestically through the adoption of footnote S5.487A into our Table of Frequency Allocations. This footnote allocation for NGSO FSS operations in the 12.2–12.7 GHz band was established at the 1997 World Radio Conference (''WRC–1997'') and modified at WRC–2000, and we find that it should facilitate the delivery of advanced services to the United States, as well as to other countries.

50. We also conclude that MVDDS can operate in the 12.2–12.7 GHz band under the existing FS allocation. Under this allocation, MVDDS operations would not be permitted to cause harmful interference to the BSS and would operate on a co-primary basis to NGSO FSS. We find that the public interest would be served by allowing MVDDS operations in this band. MVDDS could be used to deliver a wide array of video programming, including local television, and data services on either a competitive or sole source basis in both urban and rural areas. While MVDDS will only be permitted to use the 12.2–12.7 GHz band for transmissions to its subscribers, we find that full two-way services can be achieved using spectrum in other bands or existing wireline networks for the return link. Terrestrial MVDDS systems would intensively reuse available spectrum, allowing for efficient use of the band. Furthermore, it is feasible to avoid or correct harmful interference situations between MVDDS and direct broadcast satellite (''DBS'') or between MVDDS and NGSO FSS. As discussed, spectrum sharing will necessitate some restrictions on MVDDS antenna locations and transmitter power levels in order to avoid interference to DBS, and could require coordination with some NGSO FSS systems.

NGSO FSS Sharing With BSS

51. We find that the single-entry and aggregate $EPFD_{down}$ limits we are adopting will not unduly hinder the growth of BSS, as proposed in the NPRM. As discussed in more detail below, the ITU–R considered future BSS

systems and examples of advanced technology BSS links (e.g., 8PSK digital modulation and improved receiver temperature of 80 degrees Kelvin) to develop $EPFD_{down}$ limits for NGSO FSS. In addition, future BSS systems will be able to take into account the NGSO FSS interference environment.

Single-Entry $EPFD_{down}$ Limits

52. We find, based upon the technical work within the ITU, and the record developed in this proceeding, that the international consensus single-entry $EPFD_{down}$ limits for 30 cm, 45 cm, 60 cm, 90 cm, 120 cm, 180 cm, 240 cm and 300 cm diameter BSS earth station antennas are appropriate for protection of GSO BSS systems in the United States. Specifically, the combination of the two elements comprising these limits (i.e., validation including latitude-dependent, and operational) adequately protect the U.S. BSS systems. We adopt these limits as a new rule § 25.208(i) of the Commission's Rules.

53. A 15-year transition period will be included in our rules and the operational limits will no longer apply to NGSO FSS operators fifteen years from the effective date of the rules in this First R&O.

Domestic Implementation of Single-Entry $EPFD_{down}$ Limits

54. We are adopting implementation procedures for single-entry validation and latitude-dependent validation limits, and a separate set of procedures for operational limits. In addition to ensuring protection of BSS, this will assist the Commission in its need to confirm to the ITU that the appropriate limits are being met. Many of the implementation procedures we discuss are similar to the procedures we adopt to protect GSO FSS networks from NGSO FSS.

Domestic Implementation of Single-Entry Validation and Latitude-Dependent Validation Limits

55. As with the validation limits adopted to protect GSO FSS operations, in order to receive a favorable finding internationally, each NGSO FSS system must not exceed the specified validation $EPFD_{down}$ limits when analyzed using the ITU–BR software. We believe that it is imperative that NGSO FSS compliance with the single entry validation $EPFD_{down}$ limits be verified during the domestic licensing process. We will also require an NGSO FSS applicant to demonstrate prior to licensing that it meets the validation $EPFD_{down}$ limits to protect GSO BSS operations, and we will require the NGSO FSS applicants to use the software developed in accordance with the ITU software specification contained in the ITU–R Recommendation BO.1503. This software has been thoroughly evaluated by the ITU–R, including by U.S. participants in the ITU–R groups. The specific information we will require from the NGSO FSS applicants is described in detail in the GSO FSS section and new rule § 25.146(a)(1).

Domestic Implementation of $EPFD_{down}$ Operational Limits

56. We will also require an NGSO FSS applicant to demonstrate prior to becoming operational that it meets the operational $EPFD_{down}$ limits to protect GSO BSS operations. In addition, unlike the requirements for the operational limits with the ITU, we will require NGSO FSS applicants to demonstrate that they will meet the operational limits to protect BSS receive earth stations everywhere in Alaska, or Hawaii as appropriate, all of the time. Therefore, any NGSO FSS applicant that is found qualified to hold a space station authorization will be issued a conditional authorization. Specifically, as discussed in the GSO FSS section, each NGSO FSS licensee issued a conditional authorization must submit, 90 days prior to operation, technical information demonstrating compliance with the operational limits in the United States NGSO FSS applicants are fully aware of our requirements well in advance of their actual construction and operation. If the demonstration shows that the limits are not met, we will require NGSO FSS systems to apply all mitigation techniques necessary, including any changes necessary to their system design, to comply with the operational limits. In addition, if an NGSO FSS system exceeds the operational limits, it will be in violation of its obligations under the ITU Radio Regulation No. S22.2, as well as Commission rules. The information that we will require NGSO FSS system licensees to submit is described in detail in the GSO FSS section and in new rule § 25.146(b)(2).

Aggregate $EPFD_{down}$ Limits

57. We concluded in the GSO FSS section on aggregate EPFD down limits, it is necessary to ensure that the maximum aggregate interference level necessary to protect GSO BSS is not exceeded. Therefore, we will include in our rules the international consensus aggregate $EPFD_{down}$limits referred to in No. S22.5K and contained in Table [RES COM 5/6]–1D. For the same reasons discussed in the GSO FSS section on aggregate $EPFD_{down}$limits, however, we will defer a decision on whether NGSO FSS applicants should demonstrate that that they can meet the aggregate $EPFD_{down}$limits we adopt today, to the forthcoming rule making addressing NGSO to NGSO sharing, or to the licensing proceeding itself.

Protection of GSO BSS Telemetry, Tracking and Command

58. As noted in the NPRM, the issues that are specific to the protection of GSO FSS TT&C operations are also relevant for the protection of GSO BSS TT&C operations. Therefore, we adopt the same decisions that are discussed in the section above on GSO FSS TT&C operations for the GSO BSS TT&C operations.

Other DBS Applications

59. As noted in the NPRM, DIRECTV is providing DBS to antennas mounted on aircraft. We stated our belief that this type of mobile operation is consistent with the allocation because the DBS definition in the Commission's Rules does not limit transmissions to fixed receive earth stations. Nevertheless, we requested comment on whether this type of BSS operation is consistent with the Commission's Rules and whether it is appropriate to protect this type of reception. If so, we also requested comment on what EPFD limits would be appropriate to protect aircraft mobile antennas.

60. No party internationally, or in the domestic proceeding, proposed any additional specific measures or rules to protect this type of DBS receive earth station application. Based on the text of the CPM Report, and the latest round of comments, it appears that this issue has been resolved by the $EPFD_{down}$limits that we are adopting today. Therefore, we do not find it necessary to adopt any additional measures to protect DBS service to aircraft.

MVDDS Sharing With DBS

61. We conclude that MVDDS can operate in the 12.2–12.7 GHz band under the existing primary allocation, which requires that a Fixed Service not cause harmful interference to the co-primary BSS. Section 2.1 of our rules defines ''harmful interference'' as ''interference which endangers the functioning of a radionavigation service or of other safety services or seriously degrades, obstructs, or repeatedly interrupts a radiocommunication service. * * *'' In some instances, spectrum sharing may result in services causing interference or degradation to or occasional outages of other services. Spectrum management decisions often

address this issue by specifying operating requirements to minimize to the greatest extent possible the level to which such impacts occur. In this proceeding, we find that we can develop operating requirements for MVDDS that will ensure that DBS operations are not seriously degraded or subject to repeated interruptions due to MVDDS operations, thus avoiding any harmful interference to DBS.

62. We will permit a terrestrial point-to-multipoint video and data distribution service, which we will refer to as the MVDDS, to operate under Part 101 of our Rules in the 12.2–12.7 GHz band. We find, however, that determining an appropriate increased unavailability criterion for MVDDS must take into account the inherent differences between MVDDS and NGSO FSS operations. Because an NGSO FSS system operator cannot readily tailor its operations to BSS/DBS systems in different geographic areas, WRC–2000 developed EPFD values that reflect NGSO FSS impact on BSS/DBS systems over the whole NGSO FSS service area (in this country, the entire continental United States). By contrast, an MVDDS system operator can tailor its operations to avoid causing harmful interference to BSS systems in different areas, as well as to individual DBS subscribers in the same area. We will also require each MVDDS operator to mitigate interference to DBS subscribers within an area around each MVDDS transmitter where unavailability to such subscribers would otherwise exceed acceptable levels because of MVDDS transmissions. We recognize that using a worst case unavailability criterion to any DBS subscriber may pose significant constraints on MVDDS deployment, but we conclude that we should minimize any potential decrease in availability to DBS customers located in close proximity to MVDDS transmitters. We find that such an approach is feasible because an MVDDS operator can customize its transmitter deployment.

63. Finally, we find that, similar to the protection criteria developed by WRC–2000 to permit NGSO FSS/BSS sharing, any DBS protection criteria that MVDDS systems must meet should be based on a standard model using available historical and operational data.

MVDDS Sharing With NGSO FSS Downlinks

64. After reviewing the extensive filings in this proceeding, we conclude that NGSO FSS and MVDDS systems can be accommodated in the 12.2–12.7 GHz band if NGSO FSS systems limit their PFD toward MVDDS receivers and the two services avoid mainbeam to mainbeam interference. We acknowledge that this sharing arrangement will require careful planning and engineering, but the public will benefit from these efforts to introduce both of these new services. Further, we note that we are making available to NGSO FSS systems an additional 500 megahertz of service downlink spectrum at 11.7–12.2 GHz that will not be encumbered by MVDDS operations. We believe that current trends in spectrum usage require us to consider more complicated and creative sharing arrangements.

65. With respect to interference that may be caused by MVDDS transmitters to NGSO FSS earth stations, such interference could occur when an earth station that is in the vicinity of an MVDDS transmitter tracks the NGSO FSS satellite into view of the transmitter, or when energy from the MVDDS transmitter enters the side and back lobes of the earth station at a sufficient signal strength to cause harmful interference. Nevertheless, we are confident that MVDDS transmitters will not threaten the viability of NGSO FSS downlink operations. MVDDS operators will be deploying their transmitters so as to avoid harmful interference.

66. Accordingly, we conclude that MVDDS and NGSO FSS can share the 12.2–12.7 GHz band on a co-primary basis. This more intensive use of the band will allow a wide variety of new services to be delivered to the public. NGSO FSS operations will enable the delivery of broadband services to anywhere in the United States, including unserved and underserved areas. MVDDS operations will deliver competition to other video distribution and data services and offer localized service that may not be possible through other services. A future NGSO FSS licensing proceeding will explore the optimal way to assign spectrum in the 12.2–12.7 GHz band to facilitate spectrum sharing between NGSO FSS systems and MVDDS systems.

NGSO FSS Service Uplink Bands: 14.0–14.4 GHz

67. The 14.0–14.4 GHz band is allocated on a primary basis for FSS uplinks and is heavily used by very small aperture terminal (''VSAT'') operations. Additionally, we note that the 14.2–14.4 GHz band segment is allocated on a secondary basis to the mobile service, for such operations as television pickup links for part 101 licensees. Finally, we noted that the entire 14.0–14.4 GHz band is available for secondary land mobile satellite uplink operations.

68. The NGSO FSS uplink user terminal sharing scenario in the 14.0–14.4 GHz band raises issues that are similar to those regarding NGSO FSS gateway uplinks in the 12.75–13.25 and 14.4–14.5 GHz bands. For the same reasons stated in the NGSO FSS gateway uplink section, we adopt the $EPFD_{up}$ limits contained in § 25.208(k) of our rules to protect GSO FSS satellites from NGSO FSS user terminal uplink operations in the 14.0–14.4 GHz band. We also conclude that NGSO FSS gateway earth stations may also operate in the 14.0–14.4 GHz band, since NGSO FSS gateway uplinks are also subject to the same $EPFD_{up}$ limits as NGSO FSS user terminal uplinks.

GSO FSS Arc Avoidance

69. Consistent with our proposal in the NPRM, we will not adopt a specific rule that requires NGSO FSS systems to employ GSO arc avoidance. NGSO FSS operators may use various techniques, including GSO arc avoidance, to meet the $EPFD_{up}$ and $EPFD_{down}$ limits we adopt today. Considering that the amount of arc avoidance needed to meet the $EPFD_{up}$ and $EPFD_{down}$ limits is entirely dependent on the NGSO system design, we find that imposing an additional GSO arc avoidance requirement would be an unnecessary constraint on the design of NGSO FSS systems.

GSO FSS Earth Station Power Limits

70. We believe that limiting the signal energy radiated by GSO FSS earth stations could be beneficial to NGSO FSS systems by placing an upper bound on the level of uplink interference that must be tolerated. However, adopting the off-axis e.i.r.p. limits proposed in the NPRM for within ± 3 degrees of the GSO would, in effect, allow GSO FSS earth stations to transmit at a higher level into adjacent GSO FSS satellites than is currently permitted under our rules and would be disruptive to the vast number of GSO FSS satellites and earth stations in operation. The same holds true for the off-axis e.i.r.p. density limits that were adopted by WRC–2000. We conclude that the Commission's existing part 25 rules are more restrictive on GSO FSS earth stations than both the limits proposed in the NPRM and the limits adopted at WRC–2000. Further, the Commission's Rules limit the signal energy radiated in all off-axis pointing directions, not just within ±3° of the GSO orbit, thus alleviating SkyBridge's and Boeing's concerns. We will continue to require compliance with existing Part 25 rules

for off-axis e.i.r.p. limits and not adopt the proposed rule change. In regard to SkyBridge's and GE's suggestion that limits also be placed on NGSO FSS earth station off-axis e.i.r.p. density, we believe it is more appropriate to address this issue in a forthcoming Further Notice of Proposed Rule Making, which also addresses sharing among multiple NGSO FSS systems.

NGSO FSS User Terminal Earth Station Antenna Reference Pattern

71. As we stated in the NPRM, we believe that the use of higher performance earth station antennas will maximize sharing between NGSO FSS and GSO FSS systems and use of the spectrum. However, we recognize that there are physical limitations on the amount of sidelobe suppression achievable in small earth station antennas, both GSO and NGSO. We are confident that the $EPFD_{up}$ limits we adopt today ensure protection of GSO FSS satellites from NGSO FSS earth station transmissions. Further, we are confident that the Further Notice of Proposed Rule Making (Further NPRM), 66 FR 7607, January 24, 2001, will result in an adequate sharing scenario between NGSO FSS user terminals and MVDDS operations. Therefore, while specifying an NGSO FSS user terminal antenna pattern is not needed for sharing with GSO FSS or with the MVDDS, it may be a factor to consider in sharing with other NGSO FSS systems. We do not see the need at this time to specify an NGSO FSS customer premise earth station reference antenna pattern and defer the issue for consideration, as necessary, in a separate Notice of Proposed Rule Making addressing sharing issues among NGSO FSS systems.

NGSO FSS Gateway Earth Station Antenna Reference Pattern

72. We believe that the use of higher performance earth station antennas will maximize inter-system sharing and efficient use of the spectrum. In addition, a higher performance antenna reference pattern will facilitate sharing with other services. For example, tighter patterns will reduce separation distances between gateway earth stations and terrestrial stations for certain azimuths around the gateway station. Earth station technology for this size antenna is advanced to the stage where it can meet this requirement. Accordingly, we will require NGSO FSS gateway earth station antennas to meet the reference pattern of $29 - 25 \log(\theta)$ for all directions. We have, however, reconsidered our proposal to not allow 10% of the NGSO FSS earth station sidelobe peaks to exceed the envelope. The design considerations for both GSO and NGSO FSS earth stations are similar and we will allow the same percentage of peak sidelobe exceedance.

RF Safety

73. We emphasize that all FCC-regulated transmitters, including the subscriber terminals used in FSS systems, are required to meet the applicable Commission guidelines regarding radiofrequency exposure limits. It is therefore incumbent upon NGSO FSS licensees to exercise reasonable care to protect users and the public from radiofrequency exposure in excess of the Commission's limits.

74. As part of the NGSO FSS licensee's obligation to exercise such reasonable care, we conclude that it must ensure that subscriber antennas are labeled to give notice of the potential radiofrequency safety hazards from these antennas. We have previously adopted labeling requirements for LMDS, MDS, ITFS, and 24 GHz service antennas, which, like NGSO FSS's antennas, can be placed at a subscriber's premises. We see no reason to make a different determination with respect to labeling for NGSO FSS's subscriber antennas than we made for these other subscriber antennas. In addition, we have recently made labeling a condition for invoking protection from restrictions that impair the installation, maintenance, or use of customer-end antennas that are used to transmit fixed wireless service, where the antenna user has a direct or indirect ownership or leasehold interest in the property. Accordingly, we are amending Table 1 in § 1.1307(b) of the Commission's rules to provide for labeling requirements for NGSO subscriber equipment.

75. Labeling information should include minimum separation distances required between users and radiating antennas to meet the Commission's radiofrequency exposure guidelines. Labels should also include reference to the Commission's applicable radiofrequency exposure guidelines. In addition, the instruction manuals and other information accompanying subscriber transceivers should include a full explanation of the labels, as well as a reference to the applicable Commission radiofrequency exposure guidelines. While we will require licensees to attach labels and provide users with notice of potentially harmful exposure to radiofrequency electromagnetic fields, we will not mandate the specific language to be used. However, we will require use of the ANSI-specified warning symbol for radiofrequency exposure.

Emission Limits

76. In the NPRM, we proposed that the aggregate power flux density from all NGSO satellites in a constellation would have to be below -255 dBW/m^2/Hz to protect Radio Astronomy Service (''RAS'') receivers in the 10.6–10.7 GHz band from harmful interference.

77. Article S29 of the ITU Radio Regulations outlines general provisions for the protection of the RAS. Specifically, Article S29 acknowledges the sensitivity of RAS operations and encourages administrations to cooperate in protecting RAS operations from interference. Article S29 also identifies various techniques that administrations may use to protect RAS, such as geographic separation, frequency separation, time sharing and power limitations. Article S29 refers to ITU–R RA.769–1, which establishes protection criteria for various radio astronomy frequency bands. ITU–R RA.769–1 also recognizes that interference to radio astronomy operations from geostationary satellites is a special interference case because the signal energy could easily be observed by the RAS receiving antenna. We find that non-geostationary satellite downlink operations also pose a significant interference risk to radio astronomy operations unless parties make an active effort to avoid interference. The interference limits set forth in ITU–R RA.769–1 provide reasonable protection against interference to RAS operations from various operations. We note that the ITU is studying a Draft New Recommendation that would specify, for interference evaluation, a separate criterion for data loss to the RAS due to interference from any one NGSO FSS network, in any frequency band which is allocated to the Radio Astronomy Service on a primary basis. Because the Draft New Recommendation regarding NGSO FSS/RAS sharing is still under consideration, we decline to adopt specific protection limits in our rules. Rather, we will require NGSO FSS applicants to coordinate and reach a mutually acceptable agreement with the RAS facilities that use the 10.6–10.7 GHz band to ensure that these facilities are adequately protected from interference. We find that requiring coordination between NGSO FSS and RAS operations presents both parties with the most flexibility to reach agreement on the protection of RAS.

Final Regulatory Flexibility Analysis

78. As required by the Regulatory Flexibility Act (RFA)[1] an Initial Regulatory Flexibility Analysis (''IRFA'') was incorporated in the Notice of Proposed Rule Making (''NPRM'') in ET Docket No. 98–206.[2] The Commission sought written public comment on the proposals in the NPRM, including comment on the IRFA. This Final Regulatory Flexibility Analysis (''FRFA'') conforms to the RFA.[3] In addition to the issues discussed below, the IRFA addressed Northpoint Technology Ltd.'s proposal to allow terrestrial operations to use the 12.2–12.7 GHz band for the provision of MVPD services and data services.

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

79. In this First Report and Order, we permit NGSO FSS operations in certain segments of the 10.7–14.5 GHz frequency band range, and adopt rules and policies to govern such operations. More specifically, we amend Parts 2 and 25 of our rules to permit NGSO FSS space-to-earth links (''downlinks'') to operate in the 10.7–12.7 GHz band and for NGSO earth-to-space links (''uplinks'') to operate in the 12.75–13.15 GHz, 13.2125–13.25 GHz and 13.8–14.5 GHz bands. These downlink bands are generally used by geostationary-satellite orbit (''GSO'') FSS and fixed services. The uplink bands are used by GSO FSS operations, fixed services, mobile services, and Government operations. We also permit a new terrestrial Multichannel Video Distribution and Data Service (MVDDS) to operate in the 12.2–12.7 GHz band, but defer services and technical rules for the MVDDS to our companion Further Notice of Proposed Rule Making.

80. These new satellite and terrestrial operations can increase competition and provide new advanced services to the public. Specifically, NGSO FSS systems can provide new high-speed data services and offer additional competition to other satellite services, and terrestrial wireless and wireline services. The MVDDS can provide local television and data services and provide additional competition to both cable and Direct Broadcast Satellite (DBS) systems. There is, however, extensive use of the requested frequency bands in the United States and these incumbent operations provide important and valuable services to the public that we must protect. By this action, we provide for the introduction of new advanced services to the public, while permitting incumbent services to operate without harmful interference.

B. Summary of Significant Issues Raised by Public Comments In Response to the IRFA

81. No comments were submitted in response to the IRFA.

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

82. The RFA generally defines the term ''small entity'' as having the same meaning as the terms ''small business,'' ''small organization,'' and ''small governmental jurisdiction.''[4] In addition, the term ''small business'' has the same meaning as the term ''small business concern'' under the Small Business Act.[5] A small business concern is one which: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (''SBA'').[6] A small organization is generally ''any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.''[7]

83. Regarding incumbent cable television operations in the 12.75–13.25 GHz band, the SBA has developed a definition of small entities for cable and other pay television services, which includes all such companies generating $11 million or less in revenue annually. This definition includes cable systems operators, closed circuit television services, DBS services, multipoint distribution systems, satellite master antenna systems and subscription television services. According to the Census Bureau, there were 1,788 total cable and other pay television services and 1,423 had less than $11 million in revenue.

84. The Communications Act also contains a definition of a small cable system operator, which is ''a cable operator that, directly or through an affiliate, serves in the aggregate fewer than 1 percent of all subscribers in the United States and is not affiliated with any entity or entities whose gross annual revenues in the aggregate exceed $250,000,000.'' The Commission has determined that there are 61,700,000 subscribers in the United States. Therefore, we found that an operator serving fewer than 617,000 subscribers shall be deemed a small operator, if its annual revenues, when combined with the total annual revenues of all of its affiliates, do not exceed $250 million in the aggregate. Based on available data, we find that the number of cable operators serving 617,000 subscribers or less totals 1,450. We did not request nor did we collect information concerning whether cable system operators are affiliated with entities whose gross annual revenues exceed $250,000,000, and thus are unable at this time to estimate with greater precision the number of cable system operators that would qualify as small cable operators under the definition in the Communications Act.

85. Regarding incumbent GSO FSS satellite use and the proposed NGSO FSS use in these requested bands, the Commission has not developed a definition of small entities applicable to geostationary or non-geostationary orbit fixed-satellite service applicants or licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to Communications Services, Not Elsewhere Classified. This definition provides that a small entity is one with $11.0 million or less in annual receipts.[8] According to Census Bureau data, there are 848 firms that fall under the category of Communications Services, Not Elsewhere Classified, which could potentially fall into the geostationary or non-geostationary orbit fixed-satellite service category. Of those, approximately 775 reported annual receipts of $11 million or less and qualify as small entities.[9] Generally, these NGSO and GSO FSS systems cost several millions of dollars to construct and operate. Therefore the NGSO and GSO FSS companies, or their parent

[1] See 5 U.S.C. 603. The RFA, see 5 U.S.C. 601 et. seq., has been amended by the Contract With America Advancement Act of 1996, Public Law 104–121, 110 Stat. 847 (1996) (CWAAA). Title II of the CWAAA is the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA).

[2] See Notice of Proposed Rule Making, ET Docket No. 98–206, 14 FCC Rcd. 1131, 1194 (1998).

[3] See 5 U.S.C. 604.

[4] Id. Section 601(6).

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

[6] See Small Business Act, 15 U.S.C. 632 (1996).

[7] See 5 U.S.C. 601(4).

[8] See 13 CFR 121.201, Standard Industrial Classification (SIC) Code 4899.

[9] U.S. Bureau of Census, U.S. Department of Commerce, 1992 Census of Transportation, Communications, Utilities, UC92-S–1, Subject Series, Establishment and Firm Size, Table 2D, Employment Size of Firms: 1992, SIC Code 4899 (issued May 1995).

companies, rarely qualify under this definition as a small entity.

86. Regarding Auxiliary, Special Broadcast and other program distribution services in the Ku-band. This service involves a variety of transmitters, generally used to relay broadcast programming to the public (through translator and booster stations) or within the program distribution chain (from a remote news-gathering unit back to the station). The Commission has not developed a definition of small entities applicable to Broadcast Auxiliary Station (BAS) licensees. Therefore, the applicable definition of small entity is the definition under the Small Business Administration (SBA) rules applicable to radio broadcasting stations (SIC 4832) and television broadcasting stations (SIC 4833). These definitions provide, respectively, that a small entity is one with either $5.0 million or less in annual receipts or $10.5 million in annual receipts. 13 CFR 121.201, SIC Codes 4832 and 4833. There are currently 3,237 FM translators and boosters, and 2,964 TV translators. The FCC does not collect financial information on any broadcast facility and the Department of Commerce does not collect financial information on these auxiliary broadcast facilities. We believe, however, that most, if not all, of these auxiliary facilities could be classified as small businesses by themselves. We also recognize that most translators and boosters are owned by a parent station which, in some cases, would be covered by the revenue definition of small business entity discussed above. These stations would likely have annual revenues that exceed the SBA maximum to be designated as a small business (as noted, either $5 million for a radio station or $10.5 million for a TV station). Furthermore, they do not meet the Small Business Act's definition of a ''small business concern'' because they are not independently owned and operated.

87. Incumbent microwave services in the 10.7–11.7 GHz and 12.75–13.25 GHz bands include common carrier, private operational fixed, and BAS services. At present, there are 22,015 common carrier licensees, approximately 61,670 private operational fixed licensees and broadcast auxiliary radio licensees in the microwave services. Inasmuch as the Commission has not yet defined a small business with respect to microwave services, we will utilize the SBA's definition applicable to radiotelephone companies; i.e., an entity with no more than 1,500 persons. 13 CFR 121.201, SIC Code 4812. We estimate, for this purpose, that all of the Fixed Microwave licensees (excluding broadcast auxiliary licensees) would qualify as small entities under the SBA definition for radiotelephone companies.

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

88. We will apply the Part 25 rules governing reporting requirements for NGSO FSS systems. Specifically, licensees are required to file an annual report with the Commission describing: the status of satellite construction and anticipated launch dates, including any major delays or problems encountered; a listing of any unscheduled satellite outages for more than 30 minutes including the cause(s) of any such outages; and a detailed description of the utilization made of each satellite on each of the in-orbit satellites.

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

89. The Commission adopts technical rules to facilitate spectrum sharing between new NGSO FSS systems in the Ku band and existing services in this spectrum. These technical rules are intended to allow new entrants into the spectrum without causing unacceptable interference to existing and future operations of incumbent services. We acknowledge that as the radio spectrum is increasingly used, it becomes more difficult to accommodate all requests for access to the radio spectrum, however, this action applies existing frequency coordination procedures to NGSO FSS systems sharing spectrum with fixed services. Frequency coordination should ensure that new operations of either service will protect existing operations and have access to spectrum if it is technically possible.

90. The Commission also considered a proposal from the Fixed Service (FS) community to set aside some portion of the spectrum in the 10.7–11.7 GHz band for future FS deployment. The Commission declined this set aside because NGSO FSS and fixed systems should be able to coordinate operations and such an action would not lead to the most effective use of the spectrum. Additionally, in its comments and in a Petition for Rule Making, the fixed community requested that we change some aspects of the coordination and licensing procedures of FSS operations that share spectrum with fixed services. Because the issues raised by the fixed community address several spectrum bands which are not under consideration in this proceeding, we deferred on these issues to another proceeding that will address all these issues before NGSO FSS systems are licensed for this band.

91. Regarding sharing between NGSO FSS systems and broadcast auxiliary (''BAS'') operations, the Report and Order states that it will adopt some form of geographic protection areas for terrestrial operations in those bands used by NGSO FSS gateway stations. These protection areas will be defined in a future proceeding, but are intended to facilitate the growth of terrestrial operations, while not unnecessarily hindering the deployment of NGSO FSS systems. Further, to ensure BAS operations in all areas can continue to operate unencumbered by new NGSO FSS systems, the Report and Order set aside 4 BAS channels for exclusive use in all areas to ensure continued operations.

92. *Report to Congress:* The Commission will send a copy of the Report and Order, including this FRFA, in a report to be sent to Congress pursuant to the Small Business Regulatory Enforcement Fairness Act of 1996, see 5 U.S.C. 801(a)(1)(A). In addition, the Commission will send a copy of the Report and Order including FRFA, to the Chief Counsel for Advocacy of the Small Business Administration.

List of Subjects

47 CFR Part 1

Administrative practice and procedure, Satellites.

47 CFR Part 2

Communications equipment, Radio.

47 CFR Part 25

Communications common carriers, Communications equipment, Radio, Satellites.

Federal Communications Commission

William F. Caton,

Deputy Secretary.

Rules Changes

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR parts 1, 2, and 25 as follows:

PART 1—PRACTICE AND PROCEDURE

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

Authority: 47 U.S.C. 151, 154(i), 154(j), 155, 225, 303(r), 309 and 325(e).

2. Section 1.1307 (b)(1), Table 1 is amended by revising the entry for Satellite Communications (part 25) to read as follows:

§ 1.1307 Actions that may have a significant environmental effect, for which Environmental Assessments (EAs) must be prepared.

* * * * *

(b) * * *

(1) * * *

TABLE 1.—TRANSMITTERS, FACILITIES AND OPERATIONS SUBJECT TO ROUTINE ENVIRONMENTAL EVALUATION

Service (title 47 rule part)	Evaluation required if
* * *	* * * *
Satellite Communications (part 25)	All included. In addition, for NGSO subscriber equipment, licensees are required to attach a label to subscriber transceiver antennas that: (1) provides adequate notice regarding potential radiofrequency safety hazards, e.g., information regarding the safe minimum separation distance required between users and transceiver antennas; and (2) references the applicable FCC-adopted limits for radiofrequency exposure specified in § 1.1310 of this chapter.
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PART 2—FREQUENCY ALLOCATIONS AND RADIO TREATY MATTERS; GENERAL RULES AND REGULATIONS

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

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

4. Section 2.106, the Table of Frequency Allocations, is amended as follows:

a. Pages 63, 64, and 65 are revised.

b. In the list of International Footnotes, under I. New ''S'' Numbering Scheme, footnotes S5.441, S5.484A, S5.487A, S5.488, S5.492, S5.502, and S5.503 are revised.

c. In the list of United States (US) Footnotes, footnotes US355, US356, and US357 are added.

d. In the list of Non-Federal Government (NG) Footnotes, footnotes NG104, NG118, and NG143 are revised.

The revisions read as follows:

§ 2.106 Table of Frequency Allocations.

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International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
10-10.45 FIXED MOBILE RADIOLOCATION Amateur S5.479	10-10.45 RADIOLOCATION Amateur S5.479 S5.480	10-10.45 FIXED MOBILE RADIOLOCATION Amateur S5.479	10-10.45 RADIOLOCATION S5.479 US58 US108 G32	10-10.45 Radiolocation Amateur S5.479 US58 US108 NG42	Private Land Mobile (90) Amateur (97)
10.45-10.5 RADIOLOCATION Amateur Amateur-satellite S5.481			10.45-10.5 RADIOLOCATION US58 US108 G32	10.45-10.5 Radiolocation Amateur Amateur-satellite US58 US108 NG42 NG134	
10.5-10.55 FIXED MOBILE Radiolocation	10.5-10.55 FIXED MOBILE RADIOLOCATION		10.5-10.55 RADIOLOCATION US59		Private Land Mobile (90)
10.55-10.6 FIXED MOBILE except aeronautical mobile Radiolocation			10.55-10.6	10.55-10.6 FIXED	Fixed Microwave (101)
10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED MOBILE except aeronautical mobile RADIO ASTRONOMY SPACE RESEARCH (passive) Radiolocation S5.149 S5.482			10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) SPACE RESEARCH (passive) US265 US277	10.6-10.68 EARTH EXPLORATION-SATELLITE (passive) FIXED SPACE RESEARCH (passive) US265 US277	
10.68-10.7 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY SPACE RESEARCH (passive) S5.340 S5.483			10.68-10.7 EARTH EXPLORATION-SATELLITE (passive) RADIO ASTRONOMY US74 SPACE RESEARCH (passive) US246 US355		

10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) S5.441 S5.484A (Earth-to-space) S5.484 MOBILE except aeronautical mobile	10.7-11.7 FIXED FIXED-SATELLITE (space-to-Earth) S5.441 S5.484A MOBILE except aeronautical mobile		10.7-11.7 US211	10.7-11.7 FIXED NG41 FIXED-SATELLITE (space-to-Earth) S5.441 US211 NG104 US355	International Fixed (23) Satellite Communications (25) Fixed Microwave (101)
11.7-12.5 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE	11.7-12.1 FIXED S5.486 FIXED-SATELLITE (space-to-Earth) S5.484A Mobile except aeronautical mobile S5.485 S5.488	11.7-12.2 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE	11.7-12.1 S5.486	11.7-12.2 FIXED-SATELLITE (space-to-Earth) NG143 NG145 Mobile except aeronautical mobile	Satellite Communications (25) Fixed Microwave (101)
	12.1-12.2 FIXED-SATELLITE (space-to-Earth) S5.484A S5.485 S5.488 S5.489	S5.487 S5.487A S5.492	12.1-12.2	S5.486 S5.488	
S5.487 S5.487A S5.492	12.2-12.7 FIXED MOBILE except aeronautical mobile BROADCASTING BROADCASTING-SATELLITE	12.2-12.5 FIXED MOBILE except aeronautical mobile BROADCASTING S5.484A S5.487 S5.491	12.2-12.7	12.2-12.7 FIXED BROADCASTING-SATELLITE	International Fixed (23) Satellite Communications (25) Direct Broadcast Satellite (100) Fixed Microwave (101)
12.5-12.75 FIXED-SATELLITE (space-to-Earth) S5.484A (Earth-to-space)		12.5-12.75 FIXED FIXED-SATELLITE (space-to-Earth) S5.484A MOBILE except aeronautical mobile BROADCASTING-SATELLITE S5.493			
	S5.487A S5.488 S5.490 S5.492		S5.490	S5.487A S5.488 S5.490	
S5.494 S5.495 S5.496	See next page for 12.7-12.75 GHz		See next page for 12.7-12.75 GHz		See next page for 12.7-12.75 GHz

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12.7-14.5 GHz (SHF) Page 65

International Table			United States Table		FCC Rule Part(s)
Region 1	Region 2	Region 3	Federal Government	Non-Federal Government	
See previous page for 12.5-12.75 GHz	12.7-12.75 FIXED FIXED-SATELLITE (Earth-to-space) MOBILE except aeronautical mobile	See previous page for 12.5-12.75 GHz	12.7-12.75	12.7-12.75 FIXED NG118 FIXED-SATELLITE (Earth-to-space) MOBILE NG53	Satellite Communications (25) Auxiliary Broadcasting (74) Cable TV Relay (78) Fixed Microwave (101)
12.75-13.25 FIXED FIXED-SATELLITE (Earth-to-space) S5.441 MOBILE Space research (deep space) (space-to-Earth)			12.75-13.25 US251	12.75-13.25 FIXED NG118 FIXED-SATELLITE (Earth-to-space) S5.441 NG104 MOBILE US251 NG53	
13.25-13.4 EARTH EXPLORATION-SATELLITE (active) AERONAUTICAL RADIONAVIGATION S5.497 SPACE RESEARCH (active) S5.498A S5.499			13.25-13.4 AERONAUTICAL RADIONAVIGATION S5.497 Space research (Earth-to-space)		Aviation (87)
13.4-13.75 EARTH EXPLORATION-SATELLITE (active) RADIOLOCATION SPACE RESEARCH S5.501A Standard frequency and time signal-satellite (Earth-to-space) S5.499 S5.500 S5.501 S5.501B			13.4-13.75 RADIOLOCATION S5.333 US110 G59 Space research Standard frequency and time signal-satellite (Earth-to-space)	13.4-13.75 Radiolocation S5.333 US110 Space research Standard frequency and time signal-satellite (Earth-to-space)	Private Land Mobile (90)
13.75-14 FIXED-SATELLITE (Earth-to-space) S5.484A RADIOLOCATION Standard frequency and time signal-satellite (Earth-to-space) Space research S5.499 S5.500 S5.501 S5.502 S5.503 S5.503A			13.75-14 RADIOLOCATION US110 G59 Standard frequency and time signal-satellite (Earth-to-space) Space research US337 S5.503A US356 US357	13.75-14 FIXED-SATELLITE (Earth-to-space) US337 Radiolocation US110 Standard frequency and time signal-satellite (Earth-to-space) Space research S5.503A US356 US357	Satellite Communications (25) Private Land Mobile (90)

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International Footnotes

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I. New ''S'' Numbering Scheme

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S5.441 The use of the bands 4 500–4 800 MHz (space-to-Earth), 6 725–7 025 MHz (Earth-to-space) by the fixed-satellite service shall be in accordance with the provisions of Appendix S30B. The use of the bands 10.7–10.95 GHz (space-to-Earth), 11.2–11.45 GHz (space-to-Earth) and 12.75–13.25 GHz (Earth-to-space) by geostationary-satellite systems in the fixed-satellite service shall be in accordance with the provisions of Appendix S30B. The use of the bands 10.7–10.95 GHz (space-to Earth), 11.2–11.45 GHz (space-to-Earth) and 12.75–13.25 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. S9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite system in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. S5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

S5.484A The use of the bands 10.95–11.2 GHz (space-to-Earth), 11.45–11.7 GHz (space-to-Earth), 11.7–12.2 GHz (space-to-Earth) in Region 2, 12.2–12.75 GHz (space-to-Earth) in Region 3, 12.5–12.75 GHz (space-to-Earth) in Region 1, 13.75–14.5 GHz (Earth-to-space), 17.8–18.6 GHz (space-to-Earth), 19.7–20.2 GHz (space-to-Earth), 27.5–28.6 GHz (Earth-to-space), 29.5–30 GHz (Earth-to-space) by a non-geostationary-satellite system in the fixed-satellite service is subject to application of the provisions of No. S9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the fixed-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. S5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

* * * * *

S5.487A *Additional allocation:* in Region 1, the band 11.7–12.5 GHz, in Region 2, the band 12.2–12.7 GHz and, in Region 3, the band 11.7–12.2 GHz, are also allocated to the fixed-satellite service (space-to-Earth) on a primary basis, limited to non-geostationary systems and subject to application of the provisions of No. S9.12 for coordination with other non-geostationary-satellite systems in the fixed-satellite service. Non-geostationary-satellite systems in the fixed-satellite service shall not claim protection from geostationary-satellite networks in the broadcasting-satellite service operating in accordance with the Radio Regulations, irrespective of the dates of receipt by the Bureau of the complete coordination or notification information, as appropriate, for the non-geostationary-satellite systems in the fixed-satellite service and of the complete coordination or notification information, as appropriate, for the geostationary-satellite networks, and No. S5.43A does not apply. Non-geostationary-satellite systems in the fixed-satellite service in the above bands shall be operated in such a way that any unacceptable interference that may occur during their operation shall be rapidly eliminated.

S5.488 The use of the band 11.7–12.2 GHz by geostationary-satellite networks in the fixed-satellite service in Region 2 is subject to the provisions of Resolution 77 (WRC–2000). For the use of the band 12.2–12.7 GHz by the broadcasting-satellite service in Region 2, see Appendix S30.

* * * * *

S5.492 Assignments to stations of the broadcasting-satellite service which are in conformity with the appropriate regional Plan or included in the Regions 1 and 3 List in Appendix S30 may also be used for transmissions in the fixed-satellite service (space-to-Earth), provided that such transmissions do not cause more interference, or require more protection from interference, than the broadcasting-satellite service transmissions operating in conformity with the Plan or the List, as appropriate.

* * * * *

S5.502 In the band 13.75–14 GHz, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation or radionavigation services shall not exceed 59 dBW. The protection of assignments to receiving space stations in the fixed-satellite service operating with earth stations that, individually, have an e.i.r.p. of less than 68 dBW shall not impose constraints on the operation of the radiolocation and radionavigation stations operating in accordance with the Radio Regulations. No. S5.43A does not apply. See Resolution 733 (WRC–2000).

S5.503 In the band 13.75–14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

a. The e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

b. The e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in the 6 MHz band from 13.772 to 13.778 GHz.

Automatic power control may be used to increase the e.i.r.p. density in the 6 MHz band in this frequency range to compensate for rain attenuation, to the extent that the power-flux density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. of 71 dBW or 51 dBW, as appropriate, in the 6 MHz band in clear-sky conditions.

United States (US) Footnotes

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US355 In the band 10.7–11.7 GHz, non-geostationary satellite orbit

licensees in the fixed-satellite service (space-to-Earth), prior to commencing operations, shall coordinate with the following radio astronomy observatories to achieve a mutually acceptable agreement regarding the protection of the radio telescope facilities operating in the band 10.6–10.7 GHz:

Observatory	West longitude	North latitude	Elevation
Arecibo Obs	66E 45N 11O	18E 20N 46O	496 m
Green Bank Telescope (GBT)	79E 50N 24O	38E 25N 5OO	825 m
Very Large Array (VLA)	107E 37N 04O	34E 04N 44O	2126 m
Very Long Baseline Array (VLBA) Stations:			
Pie Town, NM	108E 07N 07O	34E 18N 04O	2371 m
Kitt Peak, AZ	111E 36N 42O	31E 57N 22O	1916 m
Los Alamos, NM	106E 14N 42O	35E 46N 30O	1967 m
Ft. Davis, TX	103E 56N 39O	30E 38N 06O	1615 m
N. Liberty, IA	91E 34N 26O	41E 46N 17O	241 m
Brewster, WA	119E 40N 55O	48E 07N 53O	255 m
Owens Valley, CA	118E 16N 34O	37E 13N 54O	1207 m
St. Croix, VI	64E 35N 03O	17E 45N 31O	16 m
Hancock, NH	71E 59N 12O	42E 56N O1O	309 m
Mauna Kea, HI	155E 27N 29O	19E 48N 16O	3720M

US356 In the band 13.75–14 GHz, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. In addition the e.i.r.p., averaged over one second, radiated by a station in the radiolocation service towards the geostationary-satellite orbit shall not exceed 59 dBW. Receiving space stations in the fixed-satellite service shall not claim protection from radiolocation transmitting stations operating in accordance with the United States Table of Frequency Allocations. ITU Radio Regulation No. S5.43A does not apply.

US357 In the band 13.75–14 GHz, geostationary space stations in the space research service for which information for advance publication has been received by the ITU Radiocommunication Bureau (Bureau) prior to 31 January 1992 shall operate on an equal basis with stations in the fixed-satellite service; after that date, new geostationary space stations in the space research service will operate on a secondary basis. Until those geostationary space stations in the space research service for which information for advance publication has been received by the Bureau prior to 31 January 1992 cease to operate in this band:

a. The e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in any 6 MHz band from 13.77 to 13.78 GHz;

b. The e.i.r.p. density of emissions from any earth station in the fixed-satellite service operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in any 6 MHz band from 13.77 to 13.78 GHz.

Automatic power control may be used to increase the e.i.r.p. density in any 6 MHz band in these frequency ranges to compensate for rain attenuation, to the extent that the power flux-density at the fixed-satellite service space station does not exceed the value resulting from use by an earth station of an e.i.r.p. of 71 dBW or 51 dBW, as appropriate, in any 6 MHz band in clear-sky conditions.

Non-Federal Government (NG) Footnotes

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NG104 The use of the bands 10.7–11.7 GHz (space-to-Earth) and 12.75–13.25 GHz (Earth-to-space) by the fixed-satellite service in the geostationary-satellite orbit shall be limited to international systems, *i.e.,* other than domestic systems.

* * * * *

NG118 In the bands 2025–2110 MHz, 6875–7125 MHz, and 12.7–13.25 GHz, television translator relay stations may be authorized to use frequencies on a secondary basis to other stations in the Television Broadcast Auxiliary Service that are operating in accordance with the Table of Frequency Allocations.

* * * * *

NG143 In the band 11.7–12.2 GHz, protection from harmful interference shall be afforded to transmissions from space stations not in conformance with ITU Radio Regulation S5.488 only if the operations of such space stations impose no unacceptable constraints on operations or orbit locations of space stations in conformance with S5.488.

PART 25—SATELLITE COMMUNICATIONS

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

Authority: 47 U.S.C. 701–744. Interprets or applies Sections 4, 301, 302, 303; 307, 309 and 332 of the Communications Act, as amended, 47 U.S.C. Sections 154, 301, 302, 303, 307, 309 and 332, unless otherwise noted.

6. Section 25.146 is added to Subpart B under the undesignated centerheading ''Space Stations'' to read as follows:

§ 25.146 Licensing and operating authorization provisions for the non-geostationary satellite orbit fixed-satellite service (NGSO FSS) in the bands 10.7 GHz to 14.5 GHz.

(a) A comprehensive technical showing shall be submitted for the proposed non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system in the bands 10.7 GHz to 14.5 GHz. The technical information shall demonstrate that the proposed NGSO FSS system would not exceed the validation equivalent power flux-density (EPFD) limits as specified in § 25.208 (g), (k), and (l) for $EPFD_{down}$, and $EPFD_{up}$. If the technical demonstration exceeds the validation EPFD limits at any test points within the U.S. for domestic service and at any points outside of the U.S. for international service or at any points in the geostationary satellite orbit, as appropriate, the application would be unacceptable for filing and will be returned to the applicant with a brief statement identifying the non-compliance technical demonstration. The technical showing consists of the following:

(1) *Single-entry validation equivalent power flux-density, in the space-to-Earth direction, ($EPFD_{down}$) limits.* (i) Provide a set of power flux-density (pfd) masks, on the surface of the Earth, for each space station in the NGSO FSS system. The pfd masks shall be generated in accordance with the specification stipulated in the ITU–R Recommendation BO.1503, ''Functional

Description to be used in Developing Software Tools for Determining Conformity of Non-GSO FSS Networks with Limits Contained in Article S22 of the Radio Regulations.'' In particular, the pfd mask must encompass the power flux-density radiated by the space station regardless of the satellite transmitter power resource allocation and traffic/beam switching strategy that are used at different periods of a NGSO FSS system life. The pfd masks shall also be in an electronic form that can be accessed by the computer program contained in paragraph (a)(1)(iii) of this section.

(ii) Identify and describe in detail the assumptions and conditions used in generating the power flux-density masks.

(iii) Provide a computer program for the single-entry $EPFD_{down}$ validation computation, including both the source code and the executable file. This computer program shall be developed in accordance with the specification stipulated in the ITU–R Recommendation BO.1503.

(iv) Identify and describe in detail the necessary input parameters for the execution of the computer program identified in paragraph (a)(1)(iii) of this section.

(v) Provide the result, the cumulative probability distribution function of EPFD, of the execution of the computer program described in paragraph (a)(1)(iii) of this section by using only the input parameters contained in paragraphs (a)(1)(i) and (a)(1)(iv) of this section. The result must contain the worst three (3) test points in the U.S. for domestic service and the worst three (3) test points on each continent, except Antarctica, outside of the U.S. for international services, and as many points as the number of service areas; *i.e.,* foot-prints. The center of each beam service area should be the test point coordinate.

(2) *Single-entry validation equivalent power flux-density, in the Earth-to-space direction, $EPFD_{up}$ limits.* (i) Provide a set of NGSO FSS earth station maximum equivalent isotropically radiated power (e.i.r.p.) mask as a function of the off-axis angle generated by a NGSO FSS earth station. The maximum e.i.r.p. mask shall be generated in accordance with the specification stipulated in the ITU–R Recommendation BO.1503. In particular, the results of calculations encompass what would be radiated regardless of the earth station transmitter power resource allocation and traffic/beam switching strategy are used at different periods of a NGSO FSS system life. The e.i.r.p. masks shall also be in an electronic form that can be accessed by the computer program contained in paragraph (a)(2)(iii) of this section.

(ii) Identify and describe in detail the assumptions and conditions used in generating the maximum earth station e.i.r.p. mask.

(iii) Provide a computer program for the single-entry $EPFD_{up}$ validation computation, including both the source code and the executable file. This computer program shall be developed in accordance with the specification stipulated in ITU–R Recommendation BO.1503.

(iv) Identify and describe in detail the necessary input parameters for the execution of the computer program identified in paragraph (a)(2)(iii) of this section.

(v) Provide the result of the execution of the computer program described in paragraph (a)(2)(iii) of this section by using only the input parameters contained in paragraphs (a)(2)(i) and (a)(2)(iv) of this section. The result must contain an $EPFD_{up}$ for every longitudinal location on the geostationary satellite orbit at every two-degree spacing that is visible to the U.S. for domestic service and every three-degree longitudinal location in the geostationary satellite orbit for service outside of the U.S.

(b) Ninety days prior to the initiation of service to the public, the NGSO FSS system licensee shall submit a comprehensive technical showing for the non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system in the bands 10.7 GHz to 14.5 GHz. The technical information shall demonstrate that the NGSO FSS system is expected not to operate in excess of the additional operational $EPFD_{down}$ limits and the operational $EPFD_{down}$ limits as specified in § 25.208 (i), (j) and notes 2 and 3 to the table in paragraph (l). If the technical demonstration exceeds the additional operational $EPFD_{down}$ limits or the operational $EPFD_{down}$ limits at any test points with the U.S. for domestic service and at any test points out side of the U.S. for international service, the NGSO FSS system licensee shall not initiate service to the public until the deficiency has been rectified by reducing satellite transmission power or other adjustments. This must be substantiated by subsequent technical showings. The technical showings consist of the following:

(1) *Single-entry additional operational equivalent power flux-density, in the space-to-Earth direction, (additional operational $EPFD_{down}$) limits.* (i) Provide a set of anticipated operational power flux-density (pfd) masks, on the surface of the Earth, for each space station in the NGSO FSS system. The anticipated operational power flux-density masks could be generated by using the method specified in ITU–R Recommendation BO.1503. In particular, the anticipated operational pfd mask shall take into account the expected maximum traffic loading distributions and geographic specific scheduling of the actual measured space station antenna patterns (see § 25.210(k)). The anticipated operational power flux-density masks shall also be in an electronic form that can be accessed by the computer program contained in paragraph (b)(1)(iii) of this section.

(ii) Identify and describe in detail the assumptions and conditions used in generating the anticipated operational power flux-density masks.

(iii) Provide a computer program for the single-entry additional operational $EPFD_{down}$ verification computation, including both the source code and the executable file. This computer program could be developed by using the method specified in ITU–R Recommendation BO.1503.

(iv) Identify and describe in detail the necessary input parameters for the execution of the additional operational $EPFD_{down}$ verification computer program identified in paragraph (b)(1)(iii) of this section.

(v) Provide the result, the cumulative probability distribution function of EPFD, of the execution of the verification computer program described in paragraph (b)(1)(iii) of this section by using only the input parameters contained in paragraphs (b)(1)(i) and (b)(1)(iv) of this section. The result must contains the worst three (3) test points in the U.S. for domestic service and the worst three (3) test points in each continent, excluding Antarctica, out side of the U.S. for international service plus as many points as the number of service areas; *i.e.,* foot-prints. The center of each beam service area should be the test point coordinate.

(2) *Operational equivalent power flux-density, space-to-Earth direction, (operational $EPFD_{down}$) limits.* Using the information contained in (b)(1) of this section plus the measured space station antenna patterns, provide the result of the execution of the computer simulation for the anticipated in-line operational $EPFD_{down}$ levels for the 3.0, 4.5, 6.2 and 10 m GSO FSS receiving earth station antennas having an efficiency of 65%. The result must contain the worst three (3) test points in the U.S. for domestic service and the worst three (3) test points per continent,

exclude Antarctica, out side of the U.S. for international service plus as many points as the number of service areas; i.e., foot-prints. The center of each beam service area should be the test point coordinate. In addition, also using the information contained in (b)(1) of this section plus the measured space station antenna patterns, provide the result of the execution of the computer simulation for the anticipated in-line operational $EPFD_{down}$ levels for the 180 cm GSO BSS receiving earth station antennas in Hawaii, and for 240 cm GSO BSS receiving earth station antennas in Alaska, assuming an efficiency of 65%. The result must contain the worst test point in Alaska and Hawaii, plus as many points as the number of service areas; *i.e.,* foot-prints in these areas, using the center of each beam service area should be the test point coordinate.

(c) The NGSO FSS system licensee shall, on June 30 of each year, file a report with the International Bureau and the Commission's Columbia Operations Center in Columbia, Maryland, certifying the status of the additional operational $EPFD_{down}$ levels into the 3 m and 10 m GSO FSS receiving earth station antennas, the operational $EPFD_{down}$ levels into the 3 m, 4.5 m, 6.2 m and 10 m GSO FSS receiving earth station antennas and the operational $EPFD_{down}$ levels into the 180 cm GSO BSS receiving earth station antennas in Hawaii and 240 GSO BSS receiving earth station antennas Alaska.

(d) The Commission may request at any time additional information from the NGSO FSS system applicant or licensee concerning the EPFD levels and the related technical showings.

(e) A NGSO FSS system licensee operating a system in compliance with the limits specified in § 25.208 (g), (i), (j), (k), (l) and (m) shall be considered as having fulfilled its obligations under ITU Radio Regulations provision S22.2 with respect to any GSO network. However, such NGSO FSS system shall not claim protection from GSO FSS and BSS networks operating in accordance with this part 25 or part 100 of this chapter, respectively, and the ITU Radio Regulations.

(f) Coordination will be required between NGSO FSS systems and GSO FSS earth stations in the frequency band 10.7–12.75 GHz when all of the following threshold conditions are met:

(1) Bandwidth overlap; and

(2) The satellite network using the GSO has specific receive earth stations which meet all of the following conditions: earth station antenna maximum isotropic gain greater than or equal to 64 dBi; G/T of 44 dB/K or higher; and emission bandwidth of 250 MHz; and the $EPFD_{down}$ radiated by the satellite system using the NGSO into the GSO specific receive earth station, either within the U.S. for domestic service or any points outside the U.S. for international service, exceeds -174.5 dB(W/(m^2/40 kHz)) for any percentage of time for NGSO systems with all satellites only operating at or below 2500 km altitude, or -202 dB(W/(m^2/40 kHz)) for any percentage of the time for NGSO systems with any satellites operating above 2500 km altitude.

7. Section 25.201 is amended by adding the following definitions in alphabetical order to read as follows:

§ 25.201 Definitions.

* * * * *

Equivalent power flux-density. The equivalent power flux-density (EPFD) is the sum of the power flux-densities produced at a geostationary satellite orbit (GSO) receive earth or space station on the Earth's surface or in the geostationary satellite orbit, as appropriate, by all the transmit stations within a non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system, taking into account the off-axis discrimination of a reference receiving antenna assumed to be pointing in its nominal direction. The equivalent power flux-density, in dB(W/m^2) in the reference bandwidth, is calculated using the following formula:

$$EPFD = 10 \cdot \log_{10}\left[\sum_{i=1}^{N_a} 10^{\frac{P_i}{10}} \cdot \frac{G_t(\theta_i)}{4.\pi d_i^2} \cdot \frac{G_r(\phi_i)}{G_{r,max}}\right]$$

Where:

N_a is the number of transmit stations in the non-geostationary satellite orbit system that are visible from the GSO receive station considered on the Earth's surface or in the geostationary satellite orbit, as appropriate;

i is the index of the transmit station considered in the non-geostationary satellite orbit system;

P_i is the RF power at the input of the antenna of the transmit station, considered in the non-geostationary satellite orbit system in dBW in the reference bandwidth;

2_i is the off-axis angle between the boresight of the transmit station considered in the non-geostationary satellite orbit system and the direction of the GSO receive station;

$G_t(2_i)$ is the transmit antenna gain (as a ratio) of the station considered in the non-geostationary satellite orbit system in the direction of the GSO receive station;

d_i is the distance in meters between the transmit station considered in the non-geostationary satellite orbit system and the GSO receive station;

N_i is the off-axis angle between the boresight of the antenna of the GSO receive station and the direction of the ith transmit station considered in the non-geostationary satellite orbit system;

$G_r(N_i)$ is the receive antenna gain (as a ratio) of the GSO receive station in the direction of the ith transmit station considered in the non-geostationary satellite orbit system;

$G_{r,max}$ is the maximum gain (as a ratio) of the antenna of the GSO receive station;

* * * * *

NGSO FSS gateway earth station. A gateway earth station is an earth station complex consisting of multiple interconnecting earth station antennas supporting the communication routing and switching functions of a non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system as a whole. A gateway earth station in the NGSO FSS:

(1) Does not originate or terminate radiocommunication traffic, but interconnects multiple non-collocated user earth stations operating in frequency bands other than designated gateway bands, through a satellite with other primary terrestrial networks, such as the public switched telephone network (PSTN) and/or Internet networks.

(2) Is prohibited from connecting directly with a private communication network.

(3) May also be used for telemetry, tracking, and command transmissions for the same NGSO FSS system.

(4) May include multiple antennas, each required to meet the antenna performance standard in § 25.209(h), located within an area of one second latitude by one second longitude.

(5) Is considered as a separate gateway earth station complex if it is out side of the area of one second latitude by one second longitude of paragraph (4) of this definition, for the purposes of coordination with terrestrial services.

* * * * *

8. Section 25.202 is amended by revising paragraph (a)(1) to read as follows:

§ 25.202 Frequencies, frequency tolerance and emission limitations.

(a)(1) *Frequency band.* The following frequencies are available for use by the fixed-satellite service. Precise frequencies and bandwidths of emission shall be assigned on a case-by-case basis. The Table follows:

Space-to-Earth (GHz)	Earth-to-Space (GHz)
3.7–4.2 [1]	5.925–6.425 [1]
10.7–10.95 [1 12]	12.75–13.15 [1 12]
10.95–11.2 [1 2 12]	13.2125–13.25 [1 12]
11.2–11.45 [1 12]	13.75–14 [4 12]
11.45–11.7 [1 2 12]	14–14.2 [5]
11.7–12.2 [3]	14.2–14.5
12.2–12.7 [13]	13 17.3–17.8 [9]
18.3–18.58 [1 10]	27.5–29.5 [1]
18.58–18.8 [6 10 11]	29.5–30
18.8–19.3 [7 10]	48.2–50.2
19.3–19.7 [8 10]	
19.7–20.2 [10]	
37.6–38.6	
40–41	

[1] This band is shared coequally with terrestrial radiocommunication services.

[2] Use of this band by geostationary satellite orbit satellite systems in the fixed-satellite service is limited to international systems; *i.e.*, other than domestic systems.

[3] Fixed-satellite transponders may be used additionally for transmissions in the broadcasting-satellite service.

[4] This band is shared on an equal basis with the Government radiolocation service and grandfathered space stations in the Tracking and Data Relay Satellite System.

[5] In this band, stations in the radionavigation service shall operate on a secondary basis to the fixed-satellite service.

[6] The band 18.58–18.8 GHz is shared co-equally with existing terrestrial radiocommunication systems until June 8, 2010.

[7] The band 18.8–19.3 GHz is shared co-equally with terrestrial radiocommunication services, until June 8, 2010. After this date, the sub-band 19.26–19.3 GHz is shared co-equally with existing terrestrial radiocommunication systems.

[8] The use of the band 19.3–19.7 GHz by the fixed-satellite service (space-to-Earth) is limited to feeder links for the mobile-satellite service.

[9] The use of the band 17.3–17.8 GHz by the fixed-satellite service (Earth-to-space) is limited to feeder links for broadcasting-satellite service, and the sub-band 17.7–17.8 GHz is shared co-equally with terrestrial fixed services.

[10] This band is shared co-equally with the Federal Government fixed-satellite service.

[11] The band 18.6–18.8 GHz is shared co-equally with the non-Federal Government and Federal Government Earth exploration-satellite (passive) and space research (passive) services.

[12] Use of this band by non-geostationary satellite orbit systems in the fixed-satellite service is limited to gateway earth station operations.

[13] Use of this band by the fixed-satellite service is limited to non-geostationary satellite orbit systems.

* * * * *

9. Section 25.203 is amended by revising paragraphs (b), (c), and (d) to read as follows:

§ 25.203 Choice of sites and frequencies.

* * * * *

(b) An applicant for an earth station authorization in a frequency band shared with equal rights with terrestrial microwave services shall compute the great circle coordination distance contour(s) for the proposed station in accordance with the procedures set forth in § 25.251. The applicant shall submit with the application a map or maps drawn to appropriate scale and in a form suitable for reproduction indicating the location of the proposed station and these contours. These maps, together with the pertinent data on which the computation of these contours is based, including all relevant transmitting and/or receiving parameters of the proposed station that is necessary in assessing the likelihood of interference, an appropriately scaled plot of the elevation of the local horizon as a function of azimuth, and the electrical characteristics of the earth station antenna(s), shall be submitted by the applicant in a single exhibit to the application. The coordination distance contour plot(s), horizon elevation plot, and antenna horizon gain plot(s) required by this section may also be submitted in tabular numerical format at 5° azimuthal increments instead of graphical format. At a minimum, this exhibit shall include the information listed in paragraph (c)(2) of this section. An earth station applicant shall also include in the application relevant technical details (both theoretical calculations and/or actual measurements) of any special techniques, such as the use of artificial site shielding, or operating procedures or restrictions at the proposed earth station which are to be employed to reduce the likelihood of interference, or of any particular characteristics of the earth station site which could have an effect on the calculation of the coordination distance.

(c) Prior to the filing of its application, an earth station applicant shall coordinate the proposed frequency usage with existing terrestrial users and with applicants for terrestrial station authorizations with previously filed applications in accordance with the following procedure:

(1) An applicant for an earth station authorization shall perform an interference analysis in accordance with the procedures set forth in § 25.251 for each terrestrial station, for which a license or construction permit has been granted or for which an application has been accepted for filing, which is or is to be operated in a shared frequency band to be used by the proposed earth station and which is located within the great circle coordination distance contour(s) of the proposed earth station.

(2) The earth station applicant shall provide each such terrestrial station licensee, permittee, and prior filed applicant with the technical details of the proposed earth station and the relevant interference analyses that were made. At a minimum, the earth station applicant shall provide the terrestrial user with the following technical information:

(i) The geographical coordinates of the proposed earth station antenna(s),

(ii) Proposed operating frequency band(s) and emission(s),

(iii) Antenna center height above ground and ground elevation above mean sea level,

(iv) Antenna gain pattern(s) in the plane of the main beam,

(v) Longitude range of geostationary satellite orbit (GSO) satellites at which antenna may be pointed, for proposed earth station antenna(s) accessing GSO satellites,

(vi) Horizon elevation plot,

(vii) Antenna horizon gain plot(s) determined in accordance with § 25.251 for satellite longitude range specified in paragraph (c)(2)(v) of this section, taking into account the provisions of § 25.251 for earth stations operating with non-geostationary satellites,

(viii) Minimum elevation angle,

(ix) Maximum equivalent isotropically radiated power (e.i.r.p.) density in the main beam in any 4 kHz band, (dBW/4 kHz) for frequency bands below 15 GHz or in any 1 MHz band (dBW/MHz) for frequency band above 15 GHz,

(x) Maximum available RF transmit power density in any 1 MHz band and in any 4 kHz band at the input terminals of the antenna(s),

(xi) Maximum permissible RF interference power level as determined in accordance with § 25.251 for all applicable percentages of time, and

(xii) A plot of great circle coordination distance contour(s) and

rain scatter coordination distance contour(s) as determined by § 25.251.

(3) The coordination procedures specified in § 101.103 of this chapter and § 25.251 shall be applicable except that the information to be provided shall be that set forth in paragraph (c)(2) of this section, and that the 30-day period allowed for response to a request for coordination may be increased to a maximum of 45 days by mutual consent of the parties.

(4) Where technical problems are resolved by an agreement or operating arrangement between the parties that would require special procedures be taken to reduce the likelihood of harmful interference (such as the use of artificial site shielding) or would result in lessened quality or capacity of either system, the details thereof shall be contained in the application.

(5) The Commission may, in the course of examining any application, require the submission of additional showings, complete with pertinent data and calculations in accordance with § 25.251, showing that harmful interference is not likely to result from the proposed operation.

(d) An applicant for an earth station authorization shall also ascertain whether the great circle coordination distance contours and rain scatter coordination distance contours, computed for those values of parameters indicated in § 25.251 (Appendix S7 of the ITU RR) for international coordination, cross the boundaries of another Administration. In this case, the applicant shall furnish the Commission copies of these contours on maps drawn to appropriate scale for use by the Commission in effecting coordination of the proposed earth station with the Administration(s) affected.

* * * * *

10. Section 25.204 is amended by revising paragraph (f) to read as follows:

§ 25.204 Power limits.

* * * * *

(f) In the band 13.75–14 GHz, an earth station in the fixed-satellite service shall have a minimum antenna diameter of 4.5 m and the e.i.r.p. of any emission should be at least 68 dBW and should not exceed 85 dBW. The e.i.r.p. density of emissions from any earth station in the FSS operating with a space station in geostationary-satellite orbit shall not exceed 71 dBW in any 6 MHz band from 13.77 to 13.78 GHz. The e.i.r.p. density of emissions from any earth station in the FSS operating with a space station in non-geostationary-satellite orbit shall not exceed 51 dBW in any 6 MHz band from 13.77 to 13.78 GHz. Automatic power control may be used to increase the e.i.r.p. density in the 6 MHz band in this frequency range to compensate for rain attenuation, to the extent that the power flux-density at the FSS space station does not exceed the value resulting from use by an earth station of an e.i.r.p. of 71 dBW or 51 dBW, as appropriate, in the 6 MHz band in clear-sky conditions.

* * * * *

11. Section 25.208 is amended by revising paragraph (b) and adding new paragraphs (g), (h), (i), (j), (k), (l), and (m) to read as follows:

§ 25.208 Power flux density limits.

* * * * *

(b) In the bands 10.95–11.2 and 11.45–11.7 GHz for GSO FSS space stations and 10.7–11.7 GHz for NGSO FSS space stations, the power flux-density at the Earth's surface produced by emissions from a space station for all conditions and for all methods of modulation shall not exceed the lower of the following values:

(1) -150 dB(W/m^2) in any 4 kHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; $-150 + (\delta - 5)/2$ dB(W/m^2) in any 4 kHz band for angles of arrival (δ) (in degrees) between 5 and 25 degrees above the horizontal plane; and -140 dB(W/m^2) in any 4 kHz band for angles of arrival between 25 and 90 degrees above the horizontal plane; or

(2) -126 dB(W/m^2) in any 1 MHz band for angles of arrival between 0 and 5 degrees above the horizontal plane; $-126 + (\delta - 5)/2$ dB(W/m^2) in any 1 MHz band for angles of arrival (δ) (in degrees) between 5 and 25 degrees above the horizontal plane; and -116 dB(W/m^2) in any 1 MHz band for angles of arrival between 25 and 90 degrees above the horizontal plane.

Note to paragraph (b): These limits relate to the power flux density, which would be obtained under assumed free-space propagation conditions.

* * * * *

(g) In the frequency bands 10.7–11.7 GHz and 11.7–12.2 GHz, the single-entry equivalent power-flux density in the space-to-Earth direction ($EPFD_{down}$), at any point on the Earth's surface, produced by emissions from all co-frequency space stations of a single non-geostationary-satellite orbit (NGSO) system operating in the fixed-satellite service (FSS) shall not exceed the following limits for the given percentages of time. Tables 1G and 2G follow:

TABLE 1G.—SINGLE-ENTRY $EPFD_{down}$ LIMITS FOR PROTECTION OF 0.6, 1.2, 3 AND 10 METER GSO FSS EARTH STATION ANTENNAS [1] [2]

Frequency band (GHz) for International Allocations	Single-entry $EPFD_{down}$ dB(W/m^2)	Percentage of time during which $EPFD_{down}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern [3]
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	-175.4 -174 -170.8 -165.3 -160.4 -160 -160	0 90 99 99.73 99.991 99.997 100	40	60 cm, Recommendation ITU–R S.1428.

TABLE 1G.—SINGLE-ENTRY $EPFD_{down}$ LIMITS FOR PROTECTION OF 0.6, 1.2, 3 AND 10 METER GSO FSS EARTH STATION ANTENNAS [1] [2]—Continued

Frequency band (GHz) for International Allocations	Single-entry $EPFD_{down}$ dB(W/m^2)	Percentage of time during which $EPFD_{down}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern [3]
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−181.9	0	40	1.2 m, Recommendation ITU–R S.1428.
	−178.4	99.5		
	−173.4	99.74		
	−173	99.857		
	−164	99.954		
	−161.6	99.984		
	−161.4	99.991		
	−160.8	99.997		
	−160.5	99.997		
	−160	99.9993		
	−160	100		
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−190.45	0	40	3 m, Recommendation ITU–R S.1428.
	−189.45	90		
	−187.45	99.5		
	−182.4	99.7		
	−182	99.855		
	−168	99.971		
	−164	99.988		
	−162	99.995		
	−160	99.999		
	−160	100		
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−195.45	0	40	10 m, Recommendation ITU–R S.1428.
	−195.45	99		
	−190	99.65		
	−190	99.71		
	−172.5	99.99		
	−160	99.998		
	−160	100		

[1] In addition to the limits shown in Table 1G, the limits shown in Table 2G shall apply to all antenna sizes greater than 60 cm in the frequency bands listed in Table 1G.

[2] For each reference antenna diameter, the limit consists of the complete curve on a plot which is linear in decibels for the EPFD levels and logarithmic for the time percentages, with straight lines joining the data points.

[3] The earth station antenna reference radiation patterns are to be used only for the calculation of interference from NGSO FSS systems into GSO FSS systems.

TABLE 2G.—SINGLE-ENTRY $EPFD_{down}$ LIMITS RADIATED BY NON-GSO FSS SYSTEMS AT CERTAIN LATITUDES

100% of the time $EPFD_{down}$ dB($W/(m^2/40$ kHz))	Latitude (North or South in degrees)
–160	0 < | Latitude | ≤ 57.5.
–160 + 3.4 (57.5 − | Latitude |)/4	57.5 < | Latitude | ≤ 63.75
–165.3	63.75 ≤ | Latitude |

Note to paragraph (g): These limits relate to the equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(h) In the frequency bands 10.7–11.7 GHz and 11.7–12.2 GHz, the aggregate equivalent power-flux density in the space-to-Earth direction ($EPFD_{down}$), at any point on the Earth's surface, produced by emissions from all co-frequency space stations of all non-geostationary-satellite orbit systems operating in the fixed-satellite service (FSS) shall not exceed the following limits for the given percentages of time. Tables 1H and 2H follow:

TABLE 1H.—AGGREGATE $EPFD_{down}$ LIMITS FOR PROTECTION OF 0.6, 1.2, 3 AND 10 METER GSO FSS EARTH STATION ANTENNAS [1]

Frequency band (GHz) for International Allocations	Aggregate $EPFD_{down}$ dB(W/m²)	Percentage of time during which $EPFD_{down}$ may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern [2]
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−170	0	40	60 cm, Recommendation ITU–R S.1428.
	−168.6	90		
	−165.3	99		
	−160.4	99.97		
	−160	99.99		
	−160	100		
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−176.5	0	40	1.2 m, Recommendation ITU–R S.1428.
	−173	99.5		
	−164	99.84		
	−161.6	99.945		
	−164.4	99.97		
	−160.8	99.99		
	−160.5	99.99		
	−160	99.9975		
	−160	100		
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−185	0	40	3 m, Recommendation ITU–R S.1428.
	−184	90		
	−182	99.5		
	−168	99.9		
	−164	99.96		
	−162	99.982		
	−160	99.997		
	−160	100		
10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3.	−190	0	40	10 m, Recommendation ITU–R S.1428.
	−190	99		
	−166	99.99		
	−160	99.998		
	−160	100		

[1] In addition to the limits shown in Table 1H, the aggregate $EPFD_{down}$ limits shown in Table 2H shall apply to all antenna sizes greater than 60 cm in the frequency bands listed in Table 1H.

[2] The earth station antenna reference patterns are to be used only for the calculation of interference from NGSO FSS systems into GSO FSS systems.

TABLE 2H.—SINGLE-ENTRY $EPFD_{down}$ LIMITS RADIATED BY NON-GSO FSS SYSTEMS AT CERTAIN LATITUDES

100% of the time $EPFD_{down}$ dB(W/(m²/40 kHz))	Latitude (North or South in degrees)
–160	0 < | Latitude | ≤ 57.5
–160 + 3.4 (57.5 − | Latitude |)/4	57.5 < | Latitude | ≤ 63.75
–165.3	63.75 ≤ | Latitude |

Note to paragraph (h): These limits relate to the equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(i) In the frequency bands 10.7–11.7 GHz and 11.7–12.2 GHz, the additional operational equivalent power-flux density, in the space-to-Earth direction, (additional operational $EPFD_{down}$) at any point on the Earth's surface, produced by actual operational emissions from all co-frequency space stations of a non-geostationary-satellite orbit (NGSO) system operating in the fixed-satellite service (FSS) shall not exceed the following operational limits for the given percentages of time:

ADDITIONAL OPERATIONAL LIMITS ON THE $EPFD_{down}$ RADIATED BY NON-GSO FSS SYSTEMS INTO 3 M AND 10 M GSO FSS EARTH STATION ANTENNAS

$EPFD_{down}$ dB(W/(m²/40 kHz))	Percentage of time during which $EPFD_{down}$ may not be exceeded	Receive GSO earth station antenna diameter (m)
−182	99.9.	
−179	99.94.	
−176	99.97.	
−171	99.98.	

ADDITIONAL OPERATIONAL LIMITS ON THE $EPFD_{down}$ RADIATED BY NON-GSO FSS SYSTEMS INTO 3 M AND 10 M GSO FSS EARTH STATION ANTENNAS—Continued

$EPFD_{down}$ dB(W/(m^2/40 kHz))	Percentage of time during which $EPFD_{down}$ may not be exceeded	Receive GSO earth station antenna diameter (m)
−168	99.984	3.
−165	99.993.	
−163	99.999.	
−161.25	99.99975.	
−161.25	100.	
−185	99.97.	
−183	99.98.	
−179	99.99.	
−175	99.996.	
−171	99.998	10.
−168	99.999.	
−166	99.9998.	
−166	100.	

Note to paragraph (i): These limits relate to the equivalent power flux density, which is obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(j) In the frequency bands 10.7–11.7 GHz and 11.7–12.2 GHz, the operational equivalent power-flux density, in the space-to-Earth direction, (operational $EPFD_{down}$) at any point on the Earth's surface, produced by actual operational emissions from the in-line co-frequency space station of a non-geostationary-satellite orbit (NGSO) system operating in the fixed-satellite service (FSS) shall not exceed the following operational limits for 100% of the time:

OPERATIONAL LIMITS TO THE $EPFD_{down}$ RADIATED BY NON-GSO FSS SYSTEMS IN CERTAIN FREQUENCY BANDS[1]

Frequency band (GHz) for International allocations	$EPFD_{down}$ dB(W/m^2)	Percentage of time during which $EPFD_{down}$ may not be exceeded	Reference bandwidth (kHz)	Receive GSO earth station antenna diameter[2] (m)	Orbital inclination of GSO satelite (degrees)
Prior to 31 December 2005: 10.7–11.7 in all Regions; 11.7–12.2 in Regions 2; 12.2–12.5 in Region 3; and 12.5;–12.75 in Regions 1 and 3	−163			3	
	−166	100	40	6	≤2.5
	−167.5			9	
	−169.5			≥18	
Prior to 31 December 2005: 10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3	−160			3	
	−163	100	40	6	>2.5 and ≤4.5
	−164.5			9	
	−166.5			≥18	
From 31 December 2005: 10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3	−161.25			3	
	−164	100	40	6	≤2.5
	−165.5			9	
	−167.5			≥18	
From 31 December 2005: 10.7–11.7 in all Regions; 11.7–12.2 in Region 2; 12.2–12.5 in Region 3; and 12.5–12.75 in Regions 1 and 3	−158.25			3	
	−161	100	40	6	>2.5 and ≤4.5
	−162.5			9	
	−164.5			≥18	

[1] The operational limits on the $EPFD_{down}$ radiated by non-GSO FSS systems shall be the values given in Table 2G or this table, whichever are the more stringent.

[2] For antenna diameters between the values given in this table, the limits are given by linear interpolation using a linear scale for $EPFD_{down}$ in decibels and a logarithmic scale for antenna diameter in meters.

Note to paragraph (j): These limits relate to the operational equivalent power flux-density which would be obtained under free-space propagation conditions, for all conditions, for all methods of modulation

and for the specified inclined GSO FSS operations.

(k) In the frequency bands 12.75–13.15 GHz, 13.2125–13.25 GHz and 13.75–14.5 GHz, the equivalent power flux-density, in the Earth-to-space direction, ($EPFD_{up}$) produced at any point on the geostationary satellite orbit (GSO) by the emissions from all co-frequency earth stations in a non-geostationary satellite orbit fixed-satellite service (NGSO FSS) system, for all conditions and for all methods of modulation, shall not exceed the following limits for the specified percentages of time limits:

LIMITS TO THE $EPFD_{up}$ RADIATED BY NGSO FSS SYSTEMS IN CERTAIN FREQUENCY BANDS

Frequency band (GHz) for International Allocations	$EPFD_{up}$ dB(W/m^2)	Percentage of time during which $EPFD_{up}$ may not be exceeded	Reference bandwidth (kHz)	Reference antenna beamwidth and reference radiation pattern [1]
12.5–12.75; 12.75–13.25; 13.75–14.5	−160	100	40	4° ITU–R S.672–4, Ls= − 20

[1] For the case of $L_s = -10$, the values a = 1.83 and b = 6.32 should be used in the equations in the Annex of Recommendation ITU–R S.672–4 for single-feed circular beams. In all cases of L_s, the parabolic main beam equation should start at zero.

Note to paragraph (k): These limits relate to the uplink equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(l) In the frequency bands 11.7–12.2 GHz and 12.5–12.75 GHz in Region 3, 11.7–12.5 GHz in Region 1 and 12.2–12.7 GHz in Region 2, the single-entry equivalent power-flux density, in the space-to-Earth direction, (EPFD**DOWN**), at any point on the Earth's surface, produced by emissions from all co-frequency space stations of a single non-geostationary-satellite orbit (NGSO) system operating in the fixed-satellite service (FSS) shall not exceed the following limits in Tables 1L and 2L for the given percentages of time:

TABLE 1L.—SINGLE-ENTRY EPFD DOWN LIMITS FOR PROTECTION OF 30, 45, 60, 90, 120, 180, 240 AND 300 CM GSO BSS EARTH STATION ANTENNAS [1 2 3]

Frequency band (GHz) for international allocations	$EPDF_{down}$ dB(W/m^2)	Percentage of time during which $EPFD_{down}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern [4]
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−165.841	0	40	30 cm Recommendation ITU–R BO.1443 Annex 1
	−165.541	25		
	−164.041	96		
	−158.6	98.857		
	−158.6	99.429		
	−158.33	99.429		
	−158.33	99.429		
		100		
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−175.441	0	40	45 cm Recommendation ITU–R BO.1443 Annex 1
	−172.441	66		
	−169.441	97.75		
	−164	99.357		
	−160.75	99.809		
	−160	99.986		
	−160	100		
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−176.441	0	40	60 cm Recommendation ITU–R BO. 1443 Annex 1
	−173.191	97.8		
	−167.75	99.371		
	−162	99.886		
	−161	99.943		
	−160.2	99.971		
	−160	99.997		
	−160	100		

TABLE 1L.—SINGLE-ENTRY EPFD DOWN LIMITS FOR PROTECTION OF 30, 45, 60, 90, 120, 180, 240 AND 300 CM GSO BSS EARTH STATION ANTENNAS [1 2 3]—Continued

Frequency band (GHz) for international allocations	EPDF $_{down}$ dB(W/m^2)	Percentage of time during which EPFD$_{down}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter and reference radiation pattern [4]
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−178.94 −178.44 −176.44 −171 −165.5 −163 −161 −160 −160	0 33 98 99.429 99.714 99.857 99.943 99.991 100	40	90 cm Recommendation ITU–R BO.1443 Annex 1
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−182.44 −180.69 −179.19 −178.44 −174.94 −173.75 −173 −169.5 −167.8 −164 −161.9 −161 −160.4 −160	0 90 98.9 98.9 99.5 99.68 99.68 99.85 99.915 99.94 99.97 99.99 99.998 100	40	120 cm Recommendation ITU–R BO.1443 Annex 1
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−184.941 −184.101 −181.691 −176.25 −163.25 −161.5 −160.35 −160 −160	0 33 98.5 99.571 99.946 99.974 99.993 99.999 100	40	180 cm [3] Recommendation ITU–R BO.1443 Annex 1
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−187.441 −186.341 −183.441 −178 −161.4 −161.9 −160.5 −160 −160	0 33 99.25 99.786 99.957 99.983 99.994 99.999 100	40	240 cm [2] Recommendation ITU–R BO.1443 Annex 1
11.7–12.5 in Region 1; 1.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−191.941 −189.441 −185.941 −180.5 −173 −167 −162 −160 −160	0 33 99.5 99.857 99.914 99.951 99.983 99.991 100	40	300 cm Recommendation ITU–R BO.1443 Annex 1

[1] For BSS antenna diameters 180 cm, 240 cm and 300 cm, in addition to the single-entry limits shown in Table 1L, the limits in Table 2L shall also apply in the frequency band listed in Table 1L.

[2] For 240 cm GSO BSS earth station antennas located in Alaska, communicating with GSO BSS satellites at the 91° W.L., 101° W.L., 110° W.L., 119° W.L. and 148° W.L. nominal orbital locations with elevation angles greater than 5°, −167 dB(W/(m^2/40 kHz)) single-entry 100% of the time operational EPFD$_{down}$ limit also applies to receive antennas.

[3] For 180 cm GSO BSS earth station antennas located in Hawaii communicating with GSO BSS satellites that are operational as of December 30, 1999 at the 110° W.L., 119° W.L. and 148° W.L. nominal orbital positions, −162.5 dB(W/(m^2/40 kHz)) single-entry 100% of the time operational EPFD$_{down}$ limit also applies.

[4] Under the section reference pattern of Annex 1 to Recommendation ITU-R BO.1443 shall be used only for the calculation of interference from non-GSO FSS systems into BSS systems.

TABLE 2L.—SINGLE-ENTRY $EPFD_{down}$ LIMITS RADIATED BY NON-GSO FSS SYSTEMS AT CERTAIN LATITUDES

100% of the time $EPFD_{down}$ dB(W/(m²/40 kHz))	Latitude (North or South in degrees)
−160.0	0 ≤ | Latitude | ≤ 57.5
−160.0 + 3.4 (57.5 − | Latitude |)/4	57.5 ≤ | Latitude | ≤ 63.75
−165.3	63.75 ≤ | Latitude |

Note to paragraph (l): These limits relate to the equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

(m) In the frequency bands 11.7–12.2 GHz and 12.5–12.75 GHz in Region 3, 11.7–12.5 GHz in Region 1 and 12.2–12.7 GHz in Region 2, the aggregate equivalent power-flux density, in the space-to-Earth direction, ($EPFD_{down}$) at any point on the Earth's surface, produced by emissions from all co-frequency space stations of all non-geostationary-satellite orbit systems operating in the fixed-satellite service (FSS) shall not exceed the following limits in Tables 1M and 2M for the given percentages of time:

TABLE 1M.—AGGREGATE $EPFD_{down}$ LIMITS FOR PROTECTION OF 30, 45, 60, 90, 120, 180, 240 AND 300 CM GSO BSS EARTH STATION ANTENNAS [1, 2, 3]

Frequency band (GHz) for international allocations	$EPFD_{down}$ dB (W/m²)	Percentage of time during which $EPFD_{down}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern [4]
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−160.4 −160.1 −158.6 −158.6 −158.33 −158.33	0 25 96 98 98 100	40	30 cm Recommendation ITU–R BO.1443 Annex 1.
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−170 −167 −164 −160.75 −160 −160	0 66 97.75 99.33 99.95 100	40	45 cm Recommendation ITU–R BO.1443 Annex 1.
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−171 −168.75 −167.75 −162 −161 −160.2 −160 −160	0 90 97.8 99.6 99.8 99.9 99.99 100	40	60 cm Recommendation ITU–R BO.1443 Annex 1.
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−173.75 −173 −171 −165.5 −163 −161 −160 −160	0 33 98 99.1 99.5 99.8 99.97 100	40	90 cm Recommendation ITU–R BO.1443 Annex 1.
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−177 −175.25 −173.75 −173 −169.5 −167.8 −164 −161.9 −161 −160.4 −160	0 90 98.9 98.9 99.5 99.7 99.82 99.9 99.965 99.993 100	40	120 cm Recommendation ITU–R BO.1443 Annex 1.

TABLE 1M.—AGGREGATE $EPFD_{down}$ LIMITS FOR PROTECTION OF 30, 45, 60, 90, 120, 180, 240 AND 300 CM GSO BSS EARTH STATION ANTENNAS [1, 2, 3]—Continued

Frequency band (GHz) for international allocations	$EPFD_{down}$ dB (W/m^2)	Percentage of time during which $EPFD_{down}$ level may not be exceeded	Reference bandwidth (kHz)	Reference antenna diameter, and reference radiation pattern [4]
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−179.5 −178.66 −176.25 −163.25 −161.5 −160.35 −160 −160	0 33 98.5 99.81 99.91 99.975 99.995 100	40	180 cm Recommendation ITU–R BO.1443 Annex 1.
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−182 −180.9 −178 −164.4 −161.9 −160.5 −160 −160	0 33 99.25 99.85 99.94 99.98 99.995 100	40	240 cm Recommendation ITU–R BO.1443 Annex 1.
11.7–12.5 in Region 1; 11.7–12.2 and 12.5–12.75 in Region 3; 12.2–12.7 in Region 2.	−186.5 −184 −180.5 −173 −167 −162 −160 −160	0 33 99.5 99.7 99.83 99.94 99.97 100	40	300 cm Recommendation ITU–R BO.1443 Annex 1.

[1] For BSS antenna diameters 180 cm, 240 cm and 300 cm, in addition to the aggregate limit shown in Table 1M, the limits in Table 2M shall also apply.

[2] For 240 cm GSO BSS earth station antennas located in Alaska, communicating with GSO BSS satellites at the 91° W.L., 101° W.L., 110° W.L., 119° W.L. and 148° W.L. nominal orbital locations with elevation angles greater than 5°, −167 dB($W/(m^2/40$ kHz)) aggregate 100% of the time operational $EPFD_{down}$ limit also applies to receive antennas.

[3] For 180 cm GSO BSS earth station antennas located in Hawaii communicating with GSO BSS satellites that are operational as of December 30, 1999 at the 110° W.L., 119° W.L. and 148° W.L. nominal orbital positions, −162.5 dB($W/(m^2/40$ kHz)) aggregate 100% of the time operational $EPFD_{down}$ limit also applies.

[4] Under the section reference pattern of Annex 1 to Recommendation ITU–R BO.1443 shall be used only for the calculation of interference from non-GSO FSS systems into GSO BSS systems.

TABLE 2M.—AGGREGATE $EPFD_{down}$ LIMITS RADIATED BY NON-GSO FSS SYSTEMS AT CERTAIN LATITUDES

00% of the time $EPFD_{down}$ dB($W/(m^2/40$ kHz))	Latitude (North or South in degrees)
160.0	0 ≤ | Latitude | ≤ 57.5.
160.0 + 3.4 (57.5 − | Latitude |)/4	57.5 ≤ | Latitude | ≤ 63.75.
165.3	63.75 ≤ | Latitude |.

Note to paragraph (m): These limits relate to the equivalent power flux density, which would be obtained under free-space propagation conditions, for all conditions and for all methods of modulation.

12. Section 25.209 is amended by revising paragraph (a) introductory text and adding new paragraph (h) to read as follows:

§ 25.209 Antenna performance standards.

(a) The gain of any antenna to be employed in transmission from an earth station in the geostationary satellite orbit fixed-satellite service (GSO FSS) shall lie below the envelope defined as follows:

* * * * *

(h)(1) The gain of any antennas to be employed in transmission from a gateway earth station antenna operating in the frequency bands 10.7–11.7 GHz, 12.75–13.15 GHz, 13.2125–13.25 GHz, 13.8–14.0 GHz, and 14.4–14.5 GHz and communicating with NGSO FSS satellites shall lie below the envelope defined as follows:

$29 - 25\log_{10}(\theta)$ dBi − 10 dBi

$1^B \leq \theta \leq 36^B$

$36^B \leq \theta \leq 180^B$

Where: θ is the angle in degrees from the axis of the main lobe, and dBi refers to dB relative to an isotropic radiator.

(2) For the purposes of this section, the peak gain of an individual sidelobe may not exceed the envelope defined in paragraph (h)(1) of this section.

13. Section 25.212, is amended by revising the section heading to read as follows:

§ 25.212 Narrowband transmissions in the 12/14 GHz GSO Fixed-Satellite Service.

* * * * *

14. Section 25.251 is revised to read as follows:

§ 25.251 Special requirements for coordination.

(a) The administrative aspects of the coordination process are set forth in § 101.103 of this chapter in the case of coordination of terrestrial stations with earth stations, and in § 25.203 in the case of coordination of earth stations with terrestrial stations.

(b) The technical aspects of coordination are based on Appendix S7 of the International Telecommunication Union Radio Regulations and certain recommendations of the ITU Radiocommunication Sector (available at the FCC's Reference Information Center, Room CY–A257, 445 12th Street, SW., Washington, DC 20554).

15. Section 25.271 is amended by adding new paragraph (e) to read as follows:

§ 25.271 Control of transmitting stations.

* * * * *

(e) The licensee of an NGSO FSS system operating in the 10.7–14.5 GHz bands shall maintain an electronic web site bulletin board to list the satellite ephemeris data, for each satellite in the constellation, using the North American Aerospace Defense Command (NORAD) two-line orbital element format. The orbital elements shall be updated at least once every three days.

[FR Doc. 01–3710 Filed 2–15–01; 8:45 am]

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[DA 01–273; MM Docket No. 00–222, RM–10002; MM Docket No. 00–223, RM–10003; MM Docket No. 00–224, RM–10004; MM Docket No. 00–225, RM–10005]

Radio Broadcasting Services; North English, IA; Pendleton, SC; Hamilton TX; Munday, TX

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: This document grants four proposals that allot new channels to North English, Iowa; Pendleton, South Carolina; Hamilton, Texas; and Munday, Texas. Filing windows for Channel 246A at North English, Iowa; Channel 240A at Pendleton, South Carolina; Channel 299A at Hamilton, Texas; and Channel 270C1 at Munday, Texas, will not be opened at this time. Instead, the issue of opening a filing window for these channels will be addressed by the Commission in a subsequent order.

DATES: Effective March 19, 2001.

FOR FURTHER INFORMATION CONTACT: R. Barthen Gorman, Mass Media Bureau, (202) 418–2180.

SUPPLEMENTARY INFORMATION: This is a synopsis of the Commission's Report and Order in MM Docket No. 00–222; MM Docket No. 00–223; MM Docket No. 00–224; and MM Docket No. 00–225; adopted January 24, 2001, and released February 2, 2001. The full text of this Commission decision is available for inspection and copying during normal business hours in the FCC Reference Information Center (Room CY–A257), 445 12th Street, SW., Washington, DC. The complete text of this decision may also be purchased from the Commission's copy contractor, International Transcription Service, Inc., (202) 857–3800, 1231 20th Street, NW., Washington, DC 20036.

The Commission, at the request of Iowa-Keokuk Radio (Russell Johnson, sole proprietor) allots Channel 246A at North English, Iowa, as the community's first local aural transmission service. See 65 FR 69724 (November 20, 2000). Channel 246A can be allotted at North English in compliance with the Commission's minimum distance separation requirements with a site restriction of 7.7 kilometers (4.8 miles) southwest in order to protect the signal of Station WMT–FM, Cedar Rapids, Iowa, on Channel 243C1. The coordinates for Channel 246A at North English are 41–27–15 North Latitude and 92–07–21 West Longitude.

The Commission, at the request of H. David Hedrick, allots Channel 240A at Pendleton, South Carolina, as the community's first local aural transmission service. See 65 FR 69724 (November 20, 2000). Channel 240A can be allotted to Pendleton in compliance with the Commission's minimum distance separation requirements at city reference coordinates. The coordinates for Channel 240A at Pendleton are 34–38–49 North Latitude and 82–46–37 West Longitude.

The Commission, at the request of Stargazer Broadcasting, Inc., allots Channel 299A at Hamilton, Texas, as the community's second local aural transmission service and first local FM broadcast service. See 65 FR 69724 (November 20, 2000). Channel 299A can be allotted at Hamilton in compliance with the Commission's minimum distance separation requirements with a site restriction of 11.4 kilometers (7.1 miles) northwest, in order to protect the signal of Station KAHK(FM), Georgetown, Texas, on Channel 299C3. The coordinates for Channel 299A at Hamilton are 31–46–54 North Latitude and 98–12–08 West Longitude.

The Commission, at the request of MAREE Communications, allots Channel 270C1 at Munday, Texas, as the community's first local aural transmission service. See 65 FR 69724 (November 20, 2000). Channel 270C1 can be allotted at Munday in compliance with the Commission's minimum distance separation requirements with a site restriction of 25 kilometers (15.5 miles) northwest, in order to protect the signals of Station KWFR(FM), San Angel, Texas, on Channel 270C1 and Station KZMP–FM, Axle, Texas, on Channel 269C. The coordinates for Channel 270C1 at Munday are 33–37–48 North Latitude and 99–46–57 West Longitude.

List of Subjects in 47 CFR Part 73

Radio broadcasting.

Part 73 of Title 47 of the Code of Federal Regulations is amended as follows:

PART 73—RADIO BROADCAST SERVICES

1. The authority citation for Part 73 continues to read as follows:

Authority: 47 U.S.C. 154, 303, 334 and 336.

§ 73.202 [Amended]

2. Section 73.202(b), the Table of FM Allotments under Iowa, is amended by adding North English, Channel 246A.

3. Section 73.202(b), the Table of FM Allotments under South Carolina, is amended by adding Pendleton, Channel 240A.

4. Section 73.202(b), the Table of FM Allotments under Texas, is amended by adding Channel 299A at Hamilton and Channel 270C1 at Munday.

Federal Communications Commission.

John A. Karousos,

Chief, Allocations Branch, Policy and Rules Division, Mass Media Bureau.

[FR Doc. 01–3959 Filed 2–15–01; 8:45 am]

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FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 73

[DA 01–272]

Radio Broadcasting Services; Various Locations

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: The Commission, on its own motion, editorially amends the Table of FM Allotments to specify the actual classes of channels allotted to various